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February 2001

No. 147

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Departments

- 6 Contributors
- 8 Letters
- 14 **Methods of Work**
Shopmade sliding crosscut table;
Guide blocks for hand-cut dovetails
- 22 **Notes & Comment**
Wood as miniature fine art;
Radial-arm saw recall
- 32 **Tools & Materials**
Micro-adjustments for rip fences;
Rockler bandsaw table; Chisel plane
- 84 **Current Work** NEW
A gallery of our
readers' woodworking
- 88 **Index**
Index to issues 140 to 146
- 94 **Rules of Thumb**
The card scraper
- 102 **Questions & Answers**
Flattening a sharpening stone
- 114 **Master Class**
Shape bracket feet on the bandsaw
- 125 **Finish Line**
Obtaining the luster
of just-planed wood



On the Cover:

This elegant cherry settee with a woven seat actually started out as a coffee-table drawing on a Post-it Note. See p. 61
Photo: Anatole Burkin



Glazing with polyurethane, p. 70



When mistakes happen, p. 42



Chamfers, p. 54

Articles

42 When Mistakes Happen

How to fix dings, cracks, splits and more without starting over

BY JEFF MILLER

46 Stack and Saw Lumber on the Same Rack

Cantilevered arms and a built-in chopsaw table provide plenty of storage, easy access and efficient crosscutting in a small space

BY CHRIS GOCHNOUR

48 Turning Bowls from Green Wood

The material is a joy to work, and checking *can* be prevented

BY HOWARD LEWIN

54 Chamfers

Where and why to use beveled edges, and how to cut them with hand tools

BY GARRETT HACK

58 Nail Guns for Cabinetry

A guide to using finish nailers, brad nailers, pin nailers and staplers

BY ROLAND JOHNSON

61 A Light Settee in Cherry

Straight lines simplify the design, and a woven seat adds character

BY MATTHEW TEAGUE

68 Horizontal Router Table

This easy-to-build table cuts tenons fast and accurately

BY ERNIE CONOVER

70 Glazing with Polyurethane

This nearly foolproof method offers durability and full control over the color and depth of finish

BY M. DAVID BECTON

75 A Breeding Ground for Furniture Makers

New Hampshire's modern masters have crafted a mentoring system, a marketing approach and a blossoming aesthetic that may land them in the history books

BY ASA CHRISTIANA

80 Shopmade Tension Gauge

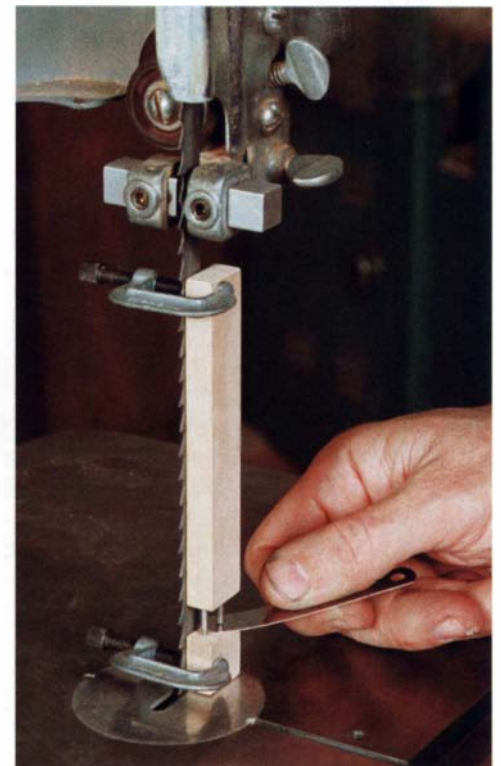
Built-in bandsaw gauges are notoriously inaccurate. Here's an inexpensive tool that eliminates guesswork

BY JOHN WHITE

83 A spring with spunk



New Hampshire's modern masters, p. 75



Shopmade bandsaw tension gauge, p. 80

Contributors

Jeff Miller ("When Mistakes Happen"), a former classical trumpet player, designs and builds furniture in Chicago. He also teaches, writes woodworking books and articles and is a father of two. Miller's furniture has been in galleries and shows nationwide, and he has won numerous awards. The Taunton Press will publish his latest book, on children's furniture, in the fall of 2002.



A little of Savannah's architectural inspiration has stayed with **M.**

David Becton ("Glazing with Polyurethane"), even after he moved from there to Americus, Ga. Becton runs Becton Ltd. (www.bectonltd.com), a custom-furniture business in Americus. Out of the shop, Becton's favorite pastime is music. He plays guitar, piano, violin, mandolin and harmonica. And he's been known to sing a little, too.



Ernie Conover ("Horizontal Router Table") directs Conover Workshops in Parkman, Ohio, offering classes in a variety of woodworking and turning techniques. As well as being

the co-designer of the Conover lathe, he has been a longtime contributor to *Fine Woodworking* and other woodworking magazines in the United States and overseas. His books include *The Router Table Book*, *The Lathe Book*, *Turning for Furniture* and *Turn a Bowl with Ernie Conover*, all published by The Taunton Press.



Originally from South Carolina, **Matthew Teague** ("A Light Settee in Cherry") spent three years in Mississippi working as an editor at *The Oxford American*, a general-interest/literary magazine that focuses on the South. As he grew more interested in woodworking, his longtime hobby, he decided he was ready for a change. In 1997 he joined the staff at *Fine Woodworking*.

Garrett Hack ("Chamfers") makes furniture for a living. His designs draw heavily on Federal, Hepplewhite and Shaker influences. Educated with a degree in civil engineering and architecture,



Hack said he was drawn into woodworking because he preferred the "micro over the macro." He moved to the rural hills of Vermont in 1979, where he still lives on a small farm with a

workhorse, two cows and one lone Rhode Island Red (shown here)—the sole survivor from a flock of a couple dozen chickens that have steadily provided a healthy diet to a local red fox.

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Howard Lewin ("Turning Bowls from Green Wood") is a woodworker and woodworking instructor in Hawthorne, Calif. Born and raised in Los Angeles, he spent 12 years in war-torn Laos during the late 1960s

and 1970s as a construction engineer for aid groups. With a crew of 400, he built bridges and buildings and tried to stay out of harm's way. Lewin opened Custom Wood Design in 1975 and has been there since, building custom cabinets, turning bowls, teaching and inventing tools.

Randall O'Donnell (Master Class) was drawn to 18th-century furniture by a process of eliminating challenges. He started out making Craftsman pieces but eventually grew restless. He enjoys 18th-century furniture for the amount of hand-tool work required to bring a piece to fruition. He lives with his wife, Susy, a potter, and two dachshunds, in Bloomfield, Ind.

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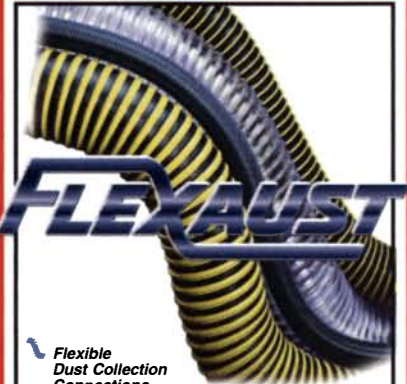
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Letters

In defense of Dunbar's history of "spokeshave"—Peter Follansbee's letter "Disagrees over history of the spokeshave" (*FWW* #145, pp. 8, 10) took exception to a reference about the name "spokeshave" that appeared in Mike Dunbar's article, "Alternative sources for wood" (Rules of Thumb, *FWW* #143, pp. 96, 98). Dunbar quoted me as a source for the derivation of the name "because it was used to work spokes, or splits, obtained for shoe lasts (shoemaker's forms), not because of an association with wheels." The letter-writer said he "has never seen a reference to the word 'spoke' meaning anything other than parts for a wheelwright's work."

As the author of the book, *Manufactured and Patented Spokeshaves & Similar Tools*, as well as dozens of articles and numerous presentations on the subject, perhaps I can clarify some points related to spokeshaves. I have been researching spokeshaves and their makers for more than 20 years.

Since my book was published, I have continued to write articles on the subject. One point I have brought out is that the term "spoke" was also applied to the splits or billets used by coopers to make staves, and coopers' shaves were sometimes referred to as spokeshaves.

In all of the books that I have consulted, I cannot recall any specific reference that actually indicates where the name of a spokeshave originated. Many of the discussions published earlier than mine cited some of the same sources. One of their similar points was that Joseph Smith's "Explanation or Key, to the Various Manufactories of Sheffield"

was the earliest source of a spokeshave illustration.

Since writing my book, I have learned of two other relevant illustrations—the earliest in *The Academy of Armory*, published in London in 1683, 133 years before the printing of Smith's "Key." Are there still older pictorial references? I think that there are. Will earlier references to tool names be found? Yes, to some degree. It's just a matter of time, interest and tenacity.

I hope that your readers get the opportunity to read a bit more about spokeshaves. In doing so they might learn that there have been more than 1,000 styles, types and designs of spokeshaves and what I classify as similar tools since 1700. Were all of the spokeshave names derived from or associated with the same source? Of course not, but it's interesting to note that of the 134 American patents closely related to the subject, 53 include the word spokeshave in the title, even more in the description. A significant portion of those 134 patents deals with shaves that were used in conjunction with the shoe trades. Some were related primarily to leather work, while most involved some aspect of working wood. A few were related to coopering and even fewer to the making of wheels. Perhaps that can be attributed to a sign of the times. Technology changes, information is lost, but fortunately some is rediscovered or reconstructed.

—Tom Lamond, Lynbrook, N.Y.

Challenges thickness-sander review—After reading Roland Johnson's very informative article on drum sanders (*FWW* #145, pp. 46-51), I noticed a few er-

rors in regards to the Grizzly Industrial Inc. model G1066 24-in. drum sander that should be brought to the attention of your readers.

The first is how you show the spring clip being installed. This is contrary to the instructions in the manual, and perhaps this explains why you had trouble with the clip flying off when you tried to install

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Jan. 21-24 and 25-28: We will again co-sponsor with Colonial Williamsburg our annual conference on working wood in the 18th century. This conference will be in two separate back-to-back sessions, both concentrating on the design, construction and finishing of chairs. Several authors and editors will take part in the sessions. Space is limited, so call quickly if you want to attend (800-603-0948).

Feb. 16-17: Editors will be in our booth at the Carolinas Industrial Woodworking Expo at the Greensboro Coliseum in Greensboro, N.C. Woodworkers from throughout the Southeast attend this show to try new tools and to talk to manufacturers' representatives.

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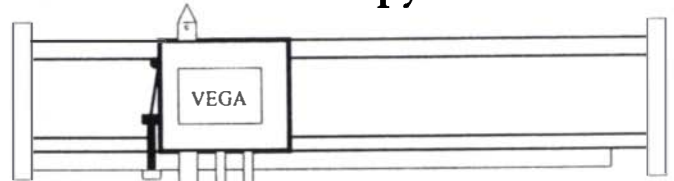
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Letters (continued)

it. We instruct that the sandpaper be placed inside the clip, then the clip and sandpaper installed on the tensioner at one time. The reason for this is that when the tensioner is driven over the top of the sandpaper it takes a great deal of force to slide that spring clip against the sandpaper. If the paper is folded and inserted into the clip as directed in the manual, then the sliding surface is the smooth back side of the sandpaper. If the clip is driven on as you show, there is tremendous friction between the clip and the abrasive side of the paper. This would certainly cause a difficult clip installation and will usually tear the paper inside the clip.

The next is the comment that it takes two people to install the paper. Having owned this machine for many years, sanding literally thousands of board feet of lumber, I can say I have never had anyone help me change the paper. Actually I find it to be a process that with a little experience can be done easily by one person. As a matter of fact I have several sections of sandpaper of varying grits that I change as needed in my shop. It simply requires that you use one hand on one drum holding that drum steady while pulling on the sandpaper attached to the tensioner of the other drum. Next simply turn the drum previously held steady, and that will pull the new sheet of paper around the other drum. While it's not quite as simple as I make it sound, after doing it a few times, you will quickly learn that it's not really a difficult job, and our customers have learned to do this quite successfully.

As a final note, you mentioned using filament tape on the Grizzly drum sander. In the manual you'll notice that it suggests using duct tape, not filament tape. Our experience has shown that the filament tape does not work well with the heat generated by the sanding process. We find that the filament tape tends to loosen and let go as the adhesive is not designed to work with the heat of the drum, whereas duct tape is designed specifically to stick when the drum reaches operating temperature. The fact that you used a filament tape may very well have been part of the problem with the paper coming off the machine.

With those few exceptions, the article was informative, and I think you highlighted the usefulness of a drum sander, not just for a professional shop but the home shop as well. We, of course, agree with you when you say, "the Grizzly was half the price," "plenty of power" and "the boards come out flat." Our goal was to build a machine affordable to our customers, and we feel we have done just that.

—William Crofutt, manager of quality control, Grizzly Industrial Inc.

ROLAND JOHNSON REPLIES: The clip was installed according to the manual, and the first attempt resulted in the clip breaking in two, scattering the pieces about the room. Subsequent attempts were done both ways: paper on the drum first and paper in the clip first. All of the methods proved awkward. Attempting to drive a tight spring clip onto a spring-loaded take-up wheel at the end of a drum that is supported by ball-bearing pillow blocks is not my idea of fun.

I tried several times to install the abrasive roll by myself without good results. I found that the spring tension on the tensioner wheel was high enough that I could not keep adequate tension and roll the abrasive paper on at the same time. I am sure that with practice I could master one-person abrasive changes, but again, it is an awkward system.

The machine was delivered with filament tape holding the abrasive strips to the drum. The failure of the tape resulted from the wood coming in direct contact with the tape. This happened because the abrasive strip was not long enough to cover the entire width of the roller, thus exposing the tape to the possibility of contact with the wood being sanded. Duct tape would have fared no better. I feel there is a need for more than just a few wraps of any tape to adequately keep the abrasive strip secured to the drum. One additional note on this subject: Even the picture of the tool on Grizzly's web site shows filament tape securing the abrasive to the drum.

Suggests a safety symbol for dangerous techniques—The photograph showing Tom Calisto ripping a curved

apron on his tablesaw (*FWW* #145, p. 60) is worth a thousand words. It shows him risking dangerous kickback, but he makes the cut look so easy that I am afraid others will want to try it. In the text, he says this is dangerous and recommends using a bandsaw as a safer alternative. But people often look at your pictures without reading the text. I know I do. It is fine to show exactly how he made the table, but the magazine has an obligation to teach safety. I suggest a note or symbol showing a safer way at the bottom of all photographs that show safety being bypassed. Perhaps a cut-hand symbol and a bandsaw photo might work.

—James Stewart, Carlisle, Ohio

There's more than one way to skin a board

—When I read Anthony Guidice's article "Four-squaring with hand tools" (*Rules of Thumb*, *FWW* #142, pp. 96, 98), my first impression was that he was arrogant. After reading his reluctant reply to Eddie Cochrane's letter suggesting he was wrong (*FWW* #145, pp. 10, 12), I have little doubt.

There is never only one way to do something or only one tool to do it with.

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Letters (continued)

Is he on the Lie-Nielsen payroll? I believe that Mr. Guidice has been a teacher too long and has forgotten about the open mind. His way might work great, but it certainly isn't the only way. Let's not forget that if one person believes a wrong idea, it is still a lousy idea, even if that person is the teacher.

—Timothy J. Barkdoll, Loves Park, Ill.

Boeshield T9 solves the paraffin wax problem—After reading Lon Schleinig's advice on keeping rust off machinery in your recent Q&A column (*FWW* #145, p. 108), we at Boeshield PMS Products have a few things to add.

We agree that paraffin wax in its solid (or even melted) form does not work well for tabletop lubrication and protection, because it does not allow for any moisture displacement. However, our product, Boeshield T9, is indeed a paraffin wax-based product with a solvent carrier that does provide for moisture displacement and does give

you an even coat over your tabletop. This even coat is important so as to avoid slick or slow spots on your tablesaw surface. The advantage to using a wax-based product is the longevity of each application. Through exhaustive testing by Boeing Aviation, it was proven that none of the synthetics held up as well, or as long as, paraffin wax.

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—David Sligh, Boeshield T9, Holland, Mich.

Correction—In the Notes & Comment item "Chairs of industrial strength" (*FWW* #145, p. 28), Michael Gilmartin's name was incorrect. Gilmartin, owner of Gilmartin Studios in Atlanta, Ga., received

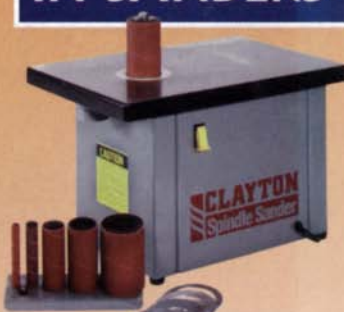
the 1999 Design Journal Gold Award for Design Excellence in the residential seating category. His winning entry, the Avos Armchair, is made of a custom-grade PS 183 marine plywood and is part of the permanent collection of the Mint Museum of Art in Charlotte, N.C. If you're interested in more of his work, he can be reached at (404) 351-7886.

About your safety

Working wood is inherently dangerous. Using hand or power tools improperly or ignoring standard safety practices can lead to permanent injury or even death. Don't try to perform operations you learn about here (or elsewhere) until you're certain they are safe for you. If something about an operation doesn't feel right, don't do it. Look for another way. We want you to enjoy the craft, so please keep safety foremost in your mind whenever you're in the shop.

—Timothy D. Schreiner, editor

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Methods of Work

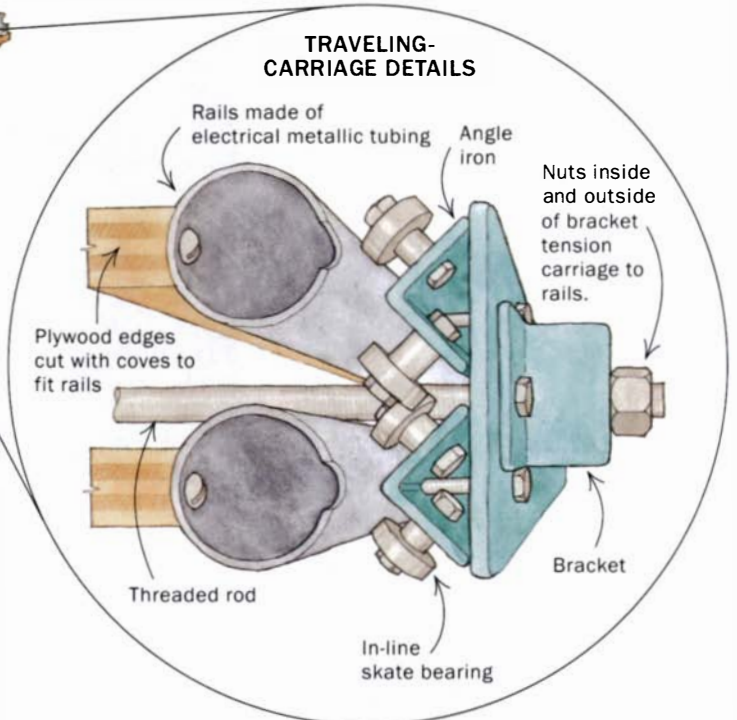
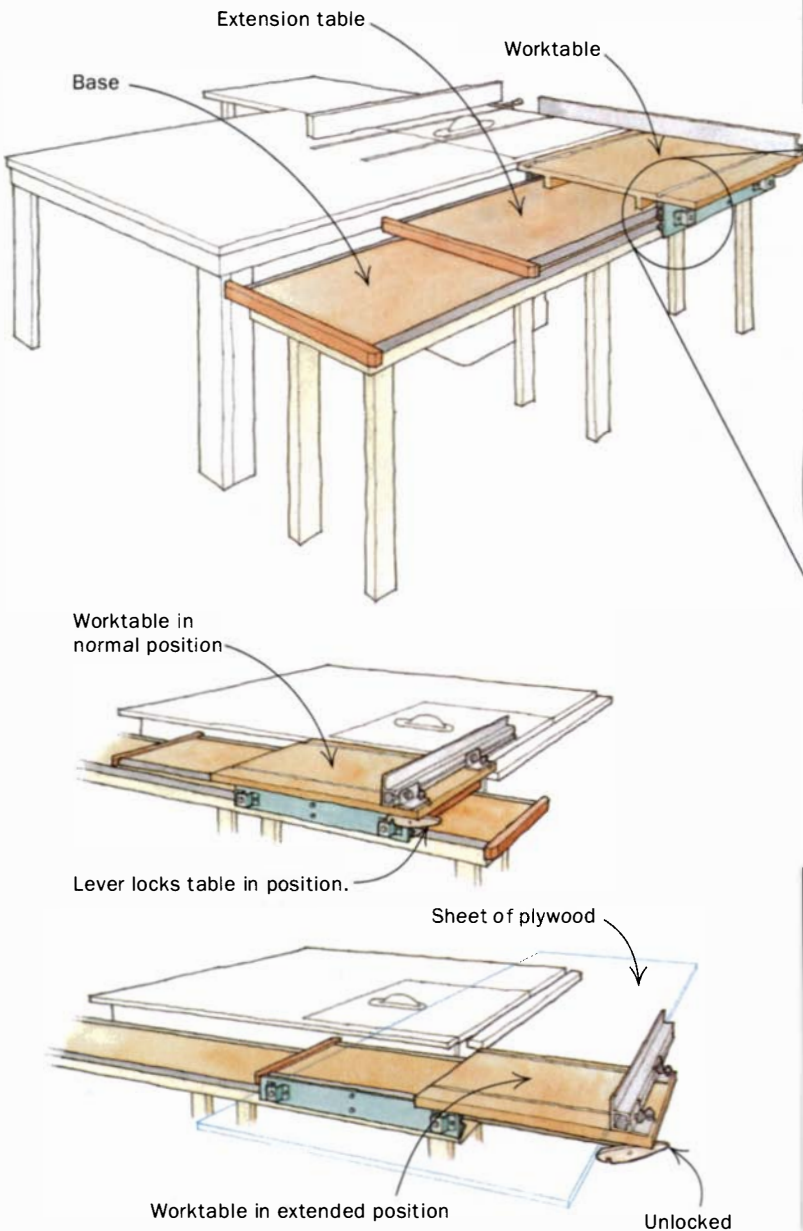
EDITED AND DRAWN BY JIM RICHEY

Shopmade sliding crosscut table

Most woodworkers appreciate the performance and accuracy that a sliding table would lend to their tablesaw, especially one with enough capacity to crosscut a full sheet of plywood. But for most of us, the costs in dollars and valuable floor space make such a piece of equipment prohibitive. Addressing those concerns, I de-

ecided to make my own sliding table based on the principle of a heavy-duty full-extension drawer slide. For everyday use, the extension table is locked onto the base and doesn't take up any extra floor space in front of the saw. But when I release a small lever, I can pull back the extension table to make a 49-in. opening and crosscut a full sheet of plywood.

The table consists of four main parts: the base, the extension table, the traveling carriage and the worktable. Start by constructing the base and the extension table of $\frac{3}{4}$ -in. plywood. Rout a cove into the edges of these two pieces to accept lengths of electrical metallic tubing, which become the rails for the traveling carriage.



Make the traveling carriage from two pieces of 4-in. flat steel plate with two pieces of angle iron bolted along each top and bottom edge to hold the in-line skate bearings that provide the rolling action. These two steel-plate assemblies are held together and tensioned by means of two threaded rods that pass between the base and the extension table, and they're locked in place by nuts inside and outside the metal brackets on each end of the carriage. Screw the worktable to the extension table using two spacers so that the worktable clears the traveling carriage. I added aluminum T-slots in the top of my worktable so that I can angle the fence in relation to the blade.

—Jack Hegarty, Tottinham, Ont., Canada
continued on p. 16

A reward for the best tip

Jack Hegarty won an engraved Lie-Nielsen handplane for his winning tip about making a sliding panel attachment for his tablesaw. Hegarty took up woodworking as a hobby 25 years ago, and he spends most of his efforts building antique reproductions for his family. The machinist's talents required for his daytime job (keeping the equipment humming for a large Canadian oil company) are evident in the design and execution of his sliding table. Send us your best tip, along with any photos or sketches (we'll redraw them) to Methods of Work, Fine Woodworking, P.O. Box 5506, Newtown, CT 06470-5506.



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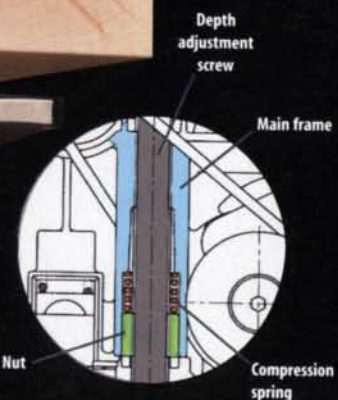
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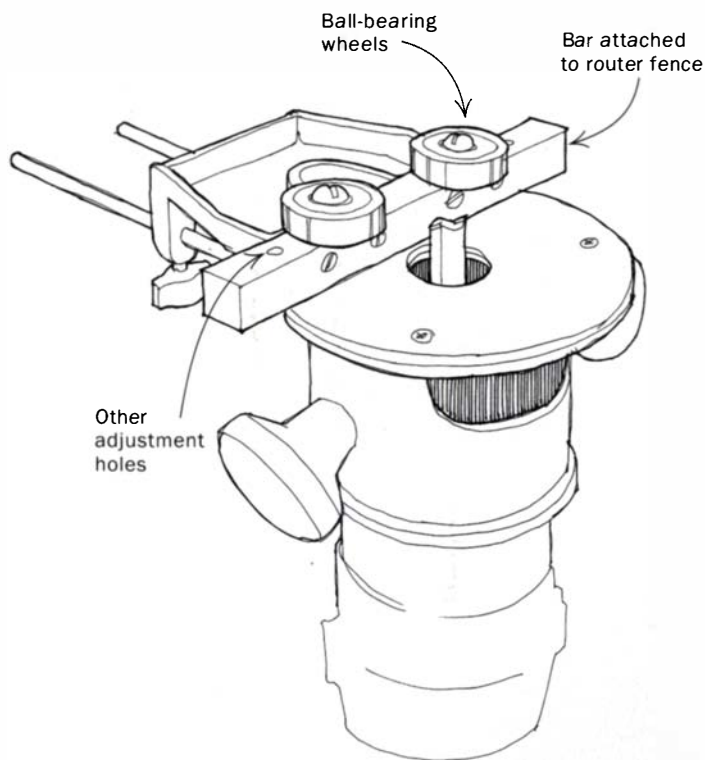
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Methods of Work (continued)

Router guide for convex curves



I just finished a job that required routing dados, veining and edging on large circular and semicircular shapes. The standard router edge guide is useless in these situations. So I modified the guide by adding two ball-bearing wheels as shown above, and now the guide follows circular shapes quite well. I drilled other adjustment holes to attach the bearings so that I can work on a wide range of circles with different radii. —David Noble, Wilmington, N.C.

Quick tip: Procter & Gamble's disposable refill cloths for the Swiffer dust sweeper make excellent tack cloths. The cloths do a great job of removing wood and sanding dust and do not interfere with subsequent finishes. They are relatively inexpensive and can be used repeatedly. —Paul L. Stotler, Leonardtown, Md.

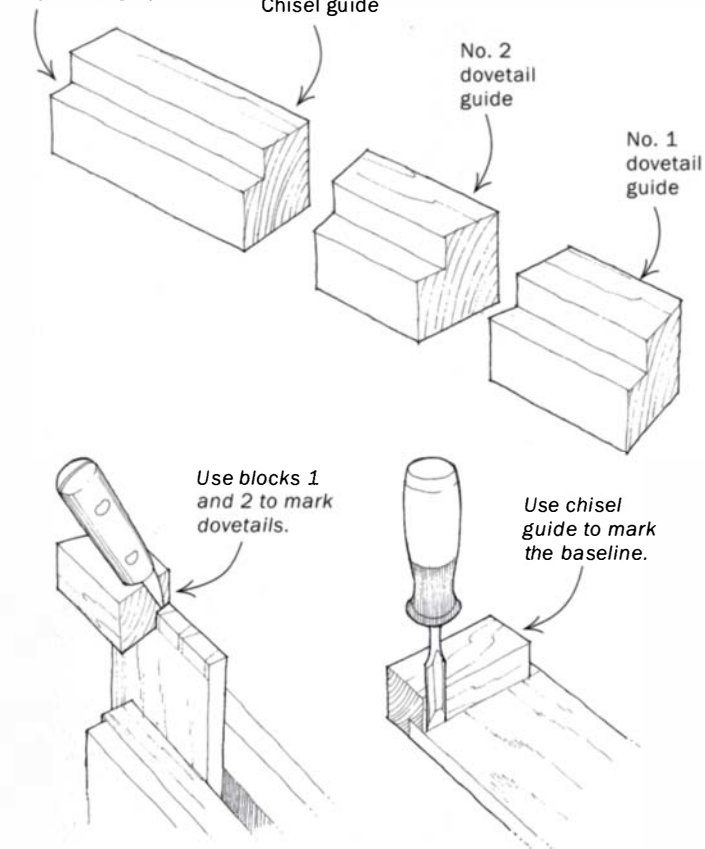
Guide blocks for hand-cut dovetails

These simple dovetail guide blocks (above right) cost nothing, are quick to make and are quite helpful for marking, cutting and paring hand dovetails. Start by ripping a 1¾-in. square hardwood block at least 12 in. long. Rabbet one corner of the block to the thickness of your dovetail stock, or (if you like your pins and tails to protrude slightly to allow trimming later) just a shade deeper.

Set your choppersaw to the desired dovetail angle and cut one end of the guide block to that angle. Flip the block 180° and cut off a piece of the block about 2 in. long. This piece is your first layout and cutting guide. Once again, flip the block 180° and cut off another piece about 2 in. long. This is your second layout and cutting guide. Square off the ends of the rest of the block to use as a chisel guide.

Use the two angled blocks to scribe the dovetail pins (or tails, depending on which you mark first). If one angled block won't

Cut rabbet to thickness of dovetail stock.



work, the other one will. After you have scribed the location of the pins, clamp or hold the appropriate block in place to guide your handsaw at the correct angle.

Use the third block to mark the depth of the baseline of the pins and tails. You can also use the third block as a chisel guide. Simply clamp it to the workpiece and press the flat of your chisel against it for the first tap.

With these guides your dovetail joints should fit perfectly. But if they don't, you can also use the blocks as a guide for paring the pins or tails with a chisel. —Glenn Crocker, Huntsville, Ala.

Quick tip: Rubber bulb syringes—the long-snouted, teardrop-shaped squeeze bulbs made for cleaning the nostrils of babies—work well in the shop to blow chips and dust from mortises, inside corners and other hard-to-reach places. The syringes are available in drug stores. —James F. Leach, Clifton Park, N.Y.

Hole-boring jig for angled spindle mortises

Recently I built a spindle-sided cradle with angled sides and ends. This type of construction requires that each spindle mortise be bored at a slightly different angle. Not trusting my eye to drill each mortise by hand, I built a simple but useful drill-press jig to accomplish the job accurately and quickly. The jig, built of ¾-in.-thick medium-density fiberboard (MDF), consists of an L-shaped base that clamps to the drill-press table and an inverted L-shaped pivoting fence for holding the workpiece. The pivoting fence should be a couple of inches shorter than the base. To make the

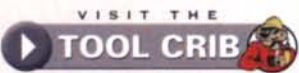
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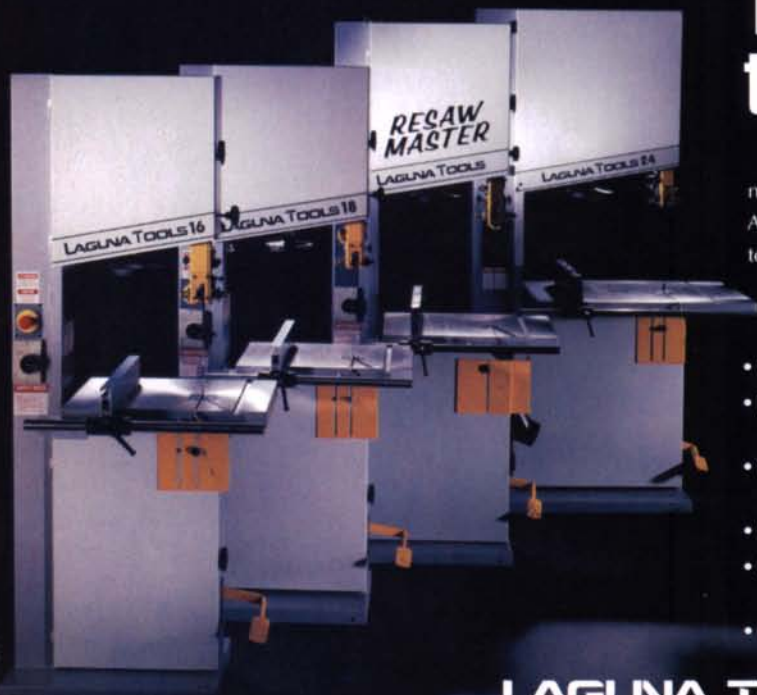
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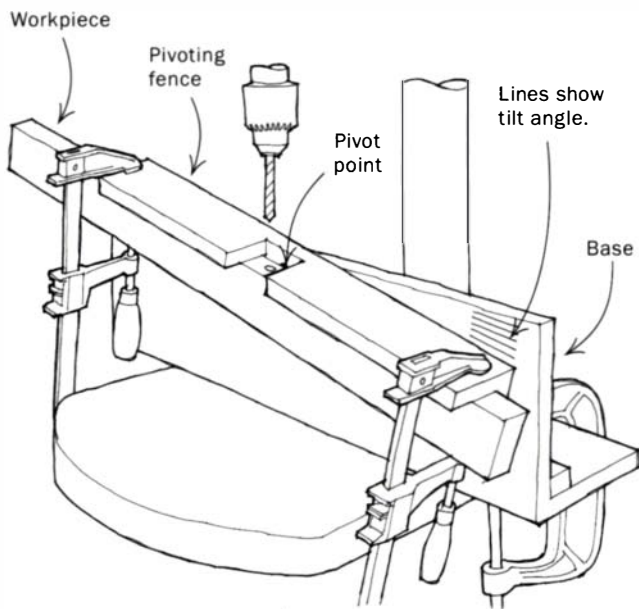
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READER SERVICE NO. 207

Methods of Work (continued)



jig, construct the two L-shaped pieces, then drill pivot holes in both the vertical plate of the base and the fence. Drill the pivot hole in the fence right at the joint of the pieces forming the inside of the L-shape. Mount the fence to the base with a 1/4-in. counter-sunk stove bolt. By mounting the pivoting fence as an inverted L and clamping the workpiece to the underside of the short leg, you can set the mortise depth, and it will remain the same for all mortises, regardless of the angle of the bore.

To use this jig, simply clamp the workpiece to the underside of the pivoting fence, rotate the fence to the correct angle and drill. Because the fence is shorter than the base, you can mark all of the reference angles for the mortises to be bored. Where each mortise angle is different, I usually just hold the pivot angle by hand. But for repeated mortises at the same setting, it is best to clamp the fence to the base at one end. —Richard Brening, Bellevue, Wash.

Quick tip: To keep brushes from drying out, place the brush inside a slide-lock plastic bag and snug up the slide on the brush handle. The bag will keep the brush from drying out for several days.

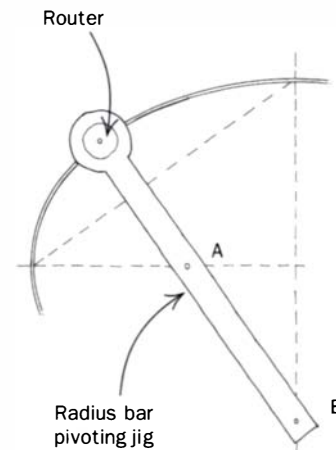
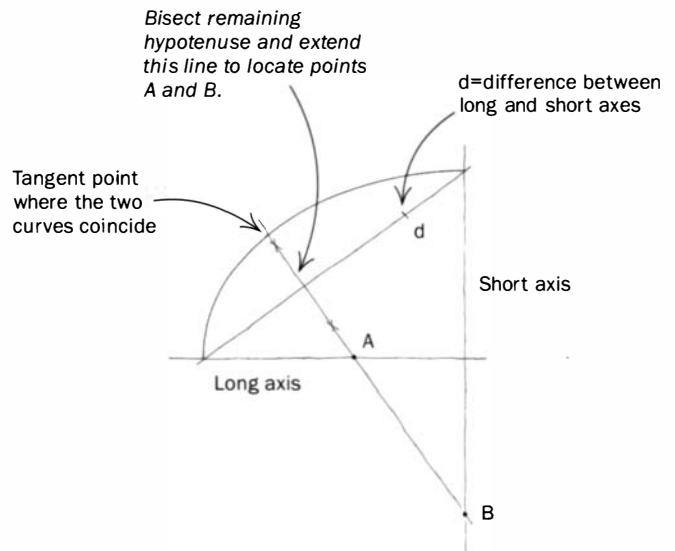
—John Martin, Racine, Wis.

Approximate ellipse is easier to cut

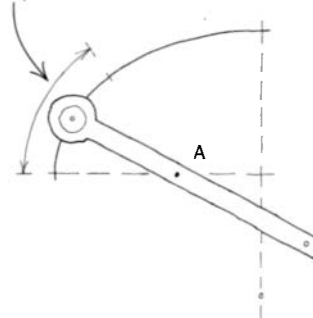
I've seen lots of complicated methods for laying out an ellipse. Here's a method for drawing a curve that closely approximates an ellipse. The advantage is that you can cut this curve with a simple pivoting jig.

The method uses an old mechanical drafting technique that approximates an ellipse one quadrant at a time by using two circular arcs of different radii. The trick is to find the two radius points (A and B) of the two circular arcs. With a little trial and error you might be able to locate them freehand.

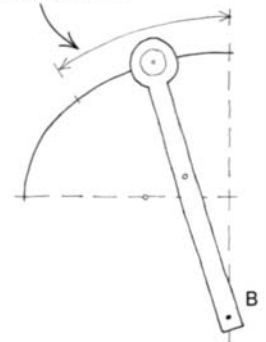
But for the more mathematically inclined, there's a more precise method. First lay out the short (minor) and long (major) axes of one quadrant of the curve, and connect the end points of the axes to produce a right triangle. On the hypotenuse of this triangle, first mark the point *d*, which is the difference between the long and



Cut this section using pivot point A.



Cut this section using pivot point B.



short axes. Bisect the remaining segment of the hypotenuse and extend the bisection line at 90° to the hypotenuse so that it intersects both the long axis at point A and the extension of the short axis at point B.

To cut the curves with a router, make a radius bar pivoting jig with two pivot points as shown above. With the bar pivoted at point A, swing the router to cut the left end of the curve. When the

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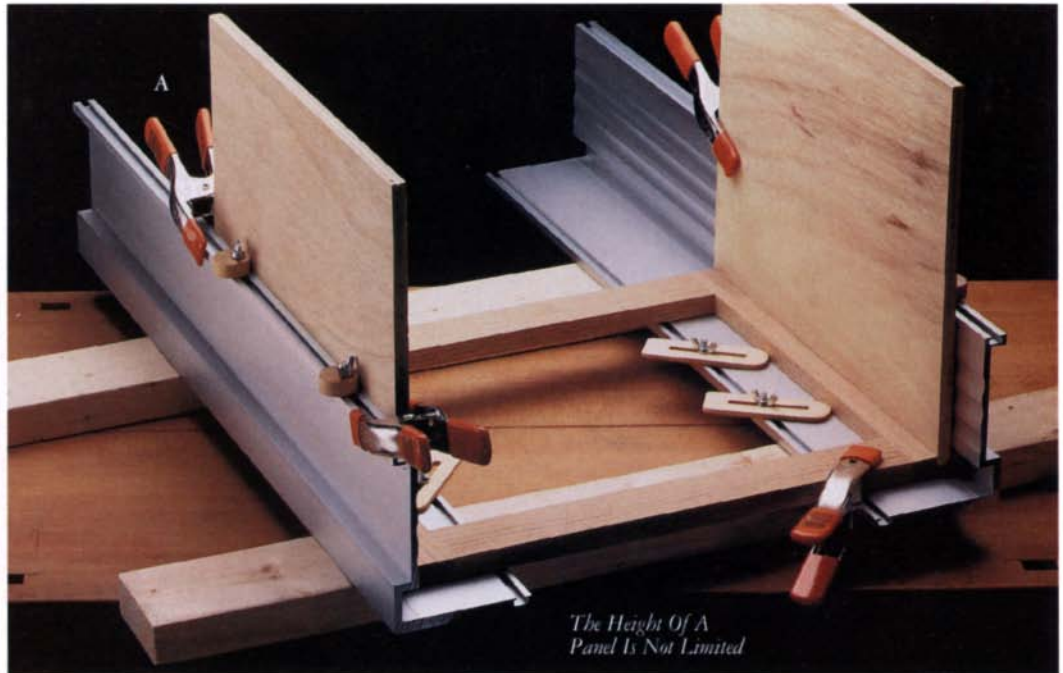
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Shown is an assembled model as well as the parts that come with the kit.

B



The Height Of A Panel Is Not Limited

When assembling cabinets, face frames, drawers or boxes, you really need something to hold the stock in place while checking squareness and during glue-up. The Universal Assembly Jig fits the bill perfectly. Unique to this jig is the built-in offset in the corner that makes it exceptionally useful for kitchen cabinets. Detailed instructions show you exactly how to use it.

This Jig can also be used to hold very long pieces, like bookshelf sides (*of virtually any height*), vertically while you fasten them. This practical lack of a height restriction gives the Jig exceptional utility. Extra-heavy (8 lbs.) extruded, anodized aluminum, it is a massive 3/8" thick and 30 1/2" long. Sides are 4 1/2" and 6". Two Adjustment Cams and two Position Clamps are included. Other clamps needed are common shop clamps (spring clamps, bar or pipe clamps etc.).

One Assembly Jig will do the job, but two are much more handy, and more economical. We highly recommend this tool. Patented.

14B01.01	Assembly Jig (each)	Regular	Sale
14B01.10	Set 2 Assembly Jigs	\$ 89.95	\$139.95

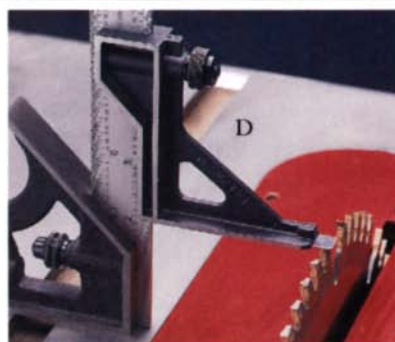
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This 1/4" scale model and its instructions, illustrate this ingenious technique which you can apply to any type of casework construction – furniture, desks, chests etc. Everyone from the most experienced worker to the novice will gain new skills quickly.

05N19.01	Casework Scale Model	\$24.95
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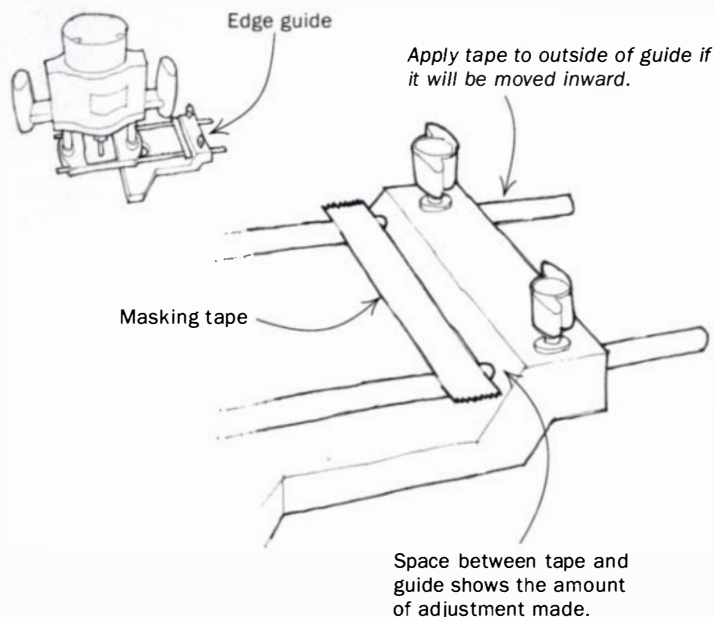
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Methods of Work (continued)

router reaches the tangent point where the two curves coincide, move the pivot point to B and cut the rest of the curve.

—Richard L. Smith, Silver Spring, Md.

Accurate adjustments on a router edge guide



To make fine adjustments using a standard router edge guide, first make a test cut on scrap, then determine the amount of adjustment required. Apply a strip of masking tape across the steel rods flush with the edge guide, as shown in the drawing above. (Apply the tape on the outside of the guide, away from the router, if the guide will be moved inward, and on the inside if it will be adjusted outward.) Loosen the knobs, and adjust the guide. The distance between the tape and the edge guide is the degree of adjustment. Very small adjustments are easy to read.

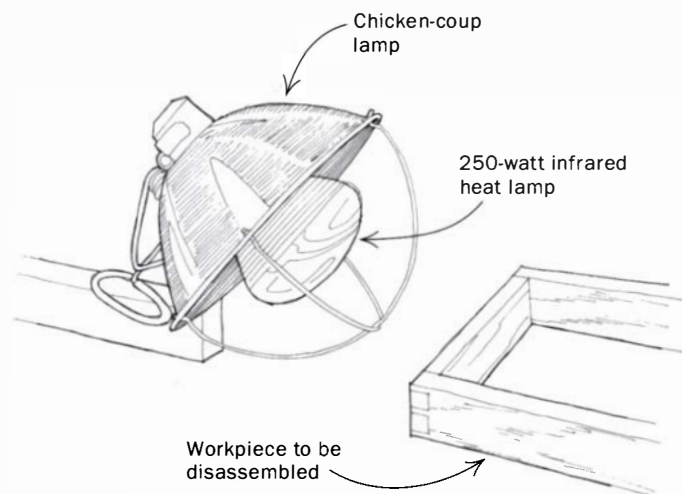
—Anthony Guidice, St. Louis, Mo.

Taking apart a glue joint with heat

Let's face it. Sometimes we mess up and need to take apart a glue joint. As long as the original joint was glued up with hide glue or white or yellow PVA glue, you're in luck. When subjected to moisture or heat, these glues lose their grip in short order. This is good news if you want to make a repair.

You can use warm water to take apart a joint, but it's messy, and it raises the grain. Heat is the better choice, but don't whip out a blowtorch just yet. When using heat to pull apart a glue joint, it is important that you use a heat source that will create a strong, deep heat without burning the wood. To accomplish this, I use a 250-watt infrared heat lamp in a portable light fixture. You can buy these lamps at a good hardware store or restaurant supplier. Be sure to buy a fixture with a heavy porcelain socket capable of handling the wattage and the heat of the lamp. Chicken-coup lamps are a good choice.

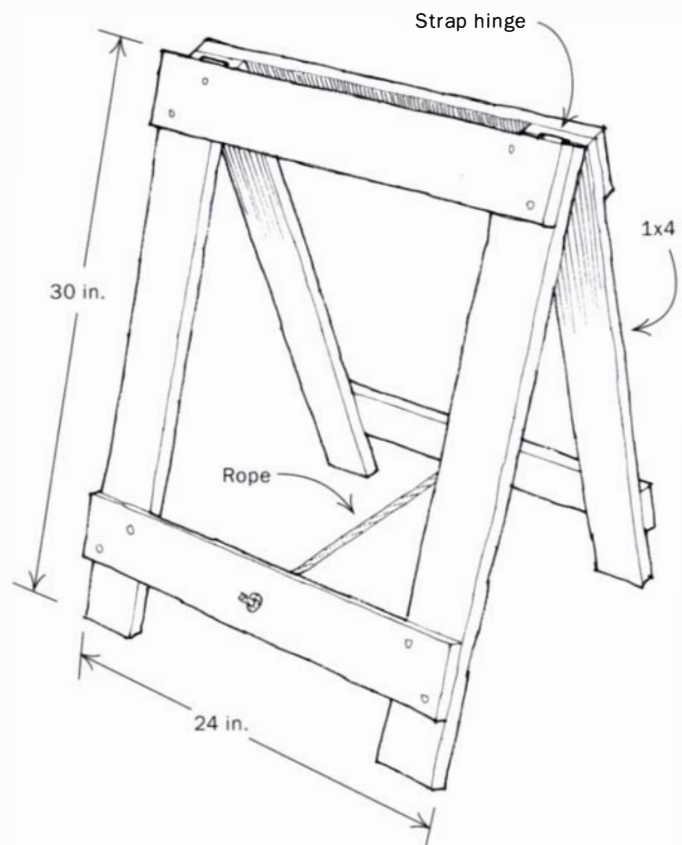
Focus the lamp right over the glue joint. In just a few minutes the glue will soften and the joint will pull right apart. Be careful—the wood will be really hot. Instead of pulling apart the joint by hand, I use a quick clamp with the head reversed. I simply apply small



amounts of pressure until the joint comes apart. Denatured alcohol and a soft wire brush are all I need to clean off the old glue.

—Clay Baker, Woodside, Calif.

Lightweight sawhorses



This sawhorse is light, strong and can be folded with one hand. It stores flat in your truck or against your shop wall. Best of all, it's cheap and easy to make. All you need are some 1/4-in. drywall screws, a short length of rope, a couple of strap hinges and some scrap 1x4s. I've made horses of several sizes, but my favorite is the one shown in the drawing above.

—Bruce Schwarz, Manchester, Md.

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Notes & Comment

Wood as miniature fine art



Small motorcycle with a large price tag. Joseph Ramsey has decided to sell his Scorpion. Ramsey is currently negotiating with the last of three bidders. The winning bid? Upward of \$50,000.

Trading in the canvas for wood in 1980, Joseph Ramsey made a conscious decision to become a self-taught woodworker, because, as he says, "learning his own techniques would ensure the originality of his work." Rather than working from plans or drawings, Ramsey designs all of his projects entirely in his mind. Likewise, the scaling of his work is done by eye.

The Scorpion motorcycle, 10 in. wide by 12 in. high by 22 in. long, is the most detailed of Ramsey's collection of miniatures. The painter-turned-woodworker from Ormond Beach, Fla., uses benchtop machines for rough-cut shaping, then further details the pieces by hand. The product of 15 months of work, the Scorpion is made of nine different species of wood and is finished with tung oil and clear shellac.

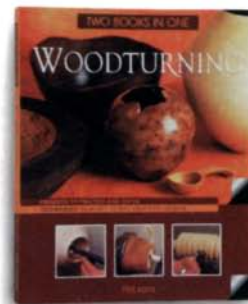
Among its many details are removable spark plugs, a moving belt drive and adjustable mirrors.

Ramsey's work has won numerous awards in craft-show competitions, garnered attention from local newspapers and TV stations and been published in national magazines. But Ramsey is most proud of the letter he received from former President Jimmy Carter after having one of his pieces presented to the avid woodworker. Carter wrote: "It is remarkable!—one of the finest examples of wood-working we have ever seen."

Ramsey currently does his work part time but does accept commissions. For further information, call (904) 672-9084.

—Christopher Baumann
is the editorial assistant.

Lessons in turning



Woodturning: two books in one by Phil Irons. Sterling Publishing, New York; 1999. \$19.95, spiral-bound; 128 pp.

The most original aspect of Phil Irons' book is its format. The upper half contains the various projects, and the lower half the skills required to complete them. Because the halves turn independently, it is possible to combine several techniques in one project in a manner that it makes them sensible, practical and realistic.

Words alone cannot describe the techniques of wood turning; therefore, the photos are most important. Here there is no doubt the photographer, Ian Howes, has succeeded.

I do have a few minor reservations. First, wood turners should never wear rings while operating a lathe because they can catch and take off a finger. Second, concerning mounting devices, all of the faceplate turning in the book is done with expansion chucks. For experienced turners this is perhaps acceptable, but I recommend that beginners use faceplates screwed into solid stock. Despite these reservations, I still recommend the book for beginners and as a refresher course for those who need it.

—Howard Lewin is a wood turner in Hawthorne, Calif.



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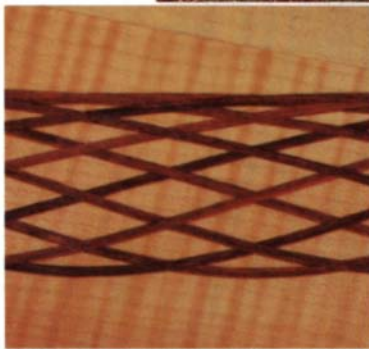
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Notes & Comment (continued)

Spiro router

Two Canadian brothers, Ian and David MacKenzie, have taken the idea behind the spirograph and developed it to make a router cut a unique inlay. Attached to the baseplate of the router is a gear, which meshes with a belt or chain laid around a template just larger than the tabletop. As the router moves around the table, it creates a wave pattern, and after a certain number of revolutions the pattern links up, creating one continuous line. David MacKenzie said using the router is nerve-racking. The router cable continually gets twisted. To prevent tearout where two lines cross, the position of the teeth is carefully noted, the router is removed, the first cut is in-laid, then the routing of the second revolution can begin. The MacKenzies can be reached at mackenzie@gulfislands.com or (250) 629-3821. —*Mark Schofield is assistant editor.*



An intriguing web. The purpleheart inlay in this western curly maple table was made using a router as a form of spirograph. A gear attached to the router base runs in a chain on a jig just larger than the tabletop.



A musical memorial. The Martin Guitar Co. is making a limited-edition guitar in honor of renowned woodworker George Nakashima. One of his chairs is shown here with the guitar.

Musical salute to Nakashima

For the last two decades of his life, George Nakashima had his signature over-sized walnut logs cut on the handmill belonging to the Martin Guitar Co. In honor of this great woodworker, the company has created a limited-edition guitar.

The sides and two-piece back are book-matched from highly figured claro walnut, perhaps Nakashima's favorite species of wood. The back panels of the guitar are joined with two of Nakashima's trademark dovetailed butterflies, made of East Indian rosewood.

The neck combines two pieces of flamed maple with a contrasting center walnut stripe. The fingerboard and bridge are ebony, while the soundboard is book-matched from rare Italian alpine spruce. The Nakashima family crest, a five-petal Japanese ivy leaf, is nested on the walnut headplate. Each of the 100 guitars made will sell for \$4,750. —*M.S.*

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Notes & Comment (continued)

World's smallest violin



Former champion. Just less than 1½ in. long, this violin used to be the world's smallest, until its maker, Cornel Schneider of Switzerland, made one barely more than 1½ in. long.

The work of Cornel Schneider gives most of us eyestrain just imagining it. He recently smashed his own world record for the smallest violin, making one 29mm long (approximately 1⅜ in.), beating the behemoth of 35.3mm shown at left. These instruments are fully acoustic, tunable and theoretically playable but would produce harmonics far above the range of human hearing.

Schneider's methods of work are similar to those used to produce life-sized instruments, while his tools are scaled-down versions of planes and chisels he made. The body begins with some straight-grained boxwood cut on a toaster-sized tablesaw. The hardest task is sawing symmetrical F-holes in the top plate, done by hand with a 0.2mm-thick sawblade. The ebony for fingerboards and tailpieces comes from discarded larger violins, while the bow hair comes from the head of his 6-year-old niece. —M.S.

Radial-arm saw recall

After receiving numerous reports of injuries, Emerson Tool Co is recalling about 3.7 million Craftsman radial-arm saws sold without a guard that covers the entire blade. The saws affected are 8-in., 9-in. and 10-in. models sold from 1958 through 1992, and the 8¼-in. saw sold from 1990 to 1995. Serial numbers for the recalled saws begin with 113—you'll find the number on the saw's base.

Emerson is offering a free blade guard for 10-in. saws that can be retrofitted. For the remaining saws that cannot accept the new blade guard, Emerson is offering \$100 for the return of the blade carriage. For further information contact Emerson (800-511-2628; www.radialarmsawrecall.com.)

Notes & Comment

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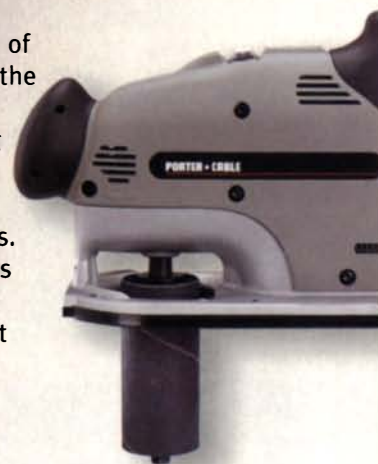
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- A. 01H20.62 15" Strap Hinge ④ \$6.40 \$5.45
- B. 01H20.52 16" Strap Hinge ⑥ \$6.80 \$5.80

Unequal Strap Hinges

Suitable for doors, lids, and flaps. All can be surface mounted at either 90° or 180°. Sizes given are decorative leaf width/mounting leaf width – add the two for overall width. Almost 1/4" across the knuckle (smallest is 1").

- C. 01H21.14 3 3/8" x 2" Hinge ⑤ \$4.25 \$3.60
- D. 01H21.27 7 1/2" x 3 1/2" Hinge ⑤ \$4.50 \$3.80
- E. 01H20.12 8" x 3" Hinge ④ \$3.75 \$3.20
- F. 01H21.33 9 1/2" x 3 1/2" Hinge ④ \$4.75 \$4.05
- G. 01H21.39 9 1/2" x 5" Hinge ⑤ \$6.80 \$5.80

Screws are not included; the required sizes are noted as (#) in the price lines.

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Hand-Forged Hinges

These hinges feature hand-cut knuckles. Sizes given are knuckle height by open width and will vary slightly as hand forged.

- H. 01A59.52 1 3/8" x 8 1/2" Forged ⑤ \$8.20 \$6.95
- J. 01A59.51 1" x 6 1/2" Forged ⑤ \$5.60 \$4.75
- K. 01A59.60 1" x 7 1/2" Forged ④ \$8.95 \$7.60

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- L. 01A59.20 2" x 6 1/2" Steel ③ \$2.60 \$2.20
- M. 01A59.30 1 1/4" x 7 1/4" Steel ⑤ \$3.80 \$3.25
- N. 01A59.10 2" x 3 3/8" Steel ④ \$1.30 \$1.10

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One of the earliest styles of hinge made, as it was readily produced with limited forging skills. Affix the single leaf to the door, drive the eyebolt into the cabinet carcass or wall, and slide the "rattail" through the eyebolt – lock in place with a single screw. The plain hinge has an overall length of 4 1/4". The large hinge is hand finished and is 6 1/8" tall, 3 1/4" wide. The small hinge is 4 3/8" tall, 2 1/2" wide.

- O. 01A59.41 Sm. Rattail Hinge ⑤ \$ 6.20 \$ 5.25
- P. 01A59.42 Lg. Rattail Hinge ⑥ \$19.50 \$16.60
- Q. 01A59.70 Plain Rattail Hinge ⑤ \$15.40 \$13.10

Restoration Escutcheons

Already rusted and pitted, or tarnished and distressed, these escutcheons fasten with small brads or screws (not included). 5/8" keyhole height.

- R. 01A19.40 1 1/4" x 7/8" Iron \$1.50 \$1.25
- S. 01A19.35 1 3/8" x 1 1/4" Iron \$2.00 \$1.70

Weathered Steel Cabinet Locks

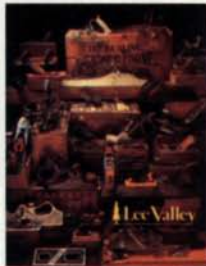
A selection of weathered steel distance-to-pin locks for use on drawers and doors. The case of the surface-mount locks projects 3/8" and overhangs the door/drawer by 1/4" (requires four #3 round-head screws). The round-end case mechanism on the mortise locks (3/16" x 15/16" tongue) makes them particularly suited for installation using a router or by sequential drilling of 1 1/8" dia. holes, just shy of 3/8" deep (requires four #4 round-head screws). See the chart for case dimensions. Cast steel keys sold separately and will fit either lock. (Discounted price available when 10 or more of the same lock are purchased.)

WEATHERED STEEL CABINET LOCKS					
All sizes are stated in inches.	Width	Depth	Case Depth	Distance to Pin	Price
T. Surface-Mount Locks					
00N29.15	1 15/16	1 3/8	1 1/16	5/8	\$3.10
00N29.20	1 15/16	1 1/2	1 1/16	13/16	\$3.10
00N29.25	1 15/16	1 11/16	1 1/16	1	\$3.10
00N29.30	1 15/16	1 7/8	1 1/16	1 3/16	\$3.10
00N29.35	1 15/16	2 1/8	1 1/16	1 7/16	\$3.95
U. Steel Mortise Locks					
00N30.15	2 3/4	1 3/8	5/8	5/8	\$2.95
00N30.20	2 3/4	1 1/2	5/8	13/16	\$2.95
00N30.25	2 3/4	1 11/16	5/8	1	\$2.95
00N30.30	2 3/4	1 7/8	5/8	1 3/16	\$2.95
00N30.35	2 3/4	2 1/8	5/8	1 3/8	\$4.50
00N30.40	2 3/4	2 5/16	5/8	1 5/8	\$4.50
V. 00N29.90 Plain Key					\$1.50
W. 00N29.95 Fancy Key					\$2.25



Fine Saws

The saws shown here are a sampling of the 5000 products found in our 268-page, full-color woodworking tools catalog.



A. Steel-Backed Dozuki

This dozuki saw has a Japanese tooth pattern (cuts on the pull stroke) and cuts like the wind. It has a 25 tpi blade that will not fail on tiny pin knots and will quickly cut both softwoods and hardwoods. Wooden handle with a steel ferrule. 22½" overall with a 10½" (265mm) blade. Made in Korea.

60T55.01 Steel-Backed Dozuki \$18.95

B. Folding Dozuki

A folding saw is convenient for working on the job site as it easily fits into a pocket or it can be stored in a tool bag. Made exclusively for us, the saw has a 16 tpi Japanese-tooth pattern blade that provides a fine, smooth cut. The 2½" deep and 0.010" thick blade cuts with a thin kerf and is flexible for trimming out. After use, the blade folds into the slotted wooden handle to a compact length of just under 12". Despite the fine teeth, it will cut a 2x4 faster than any traditional Western saw.

60T56.01 Folding Dozuki \$19.95

C. Veritas® Dovetail Saw Guide System

Hand-cut dovetails remain the mark of the skilled cabinetmaker. This guide and saw system lets amateurs achieve professional results and the seasoned expert to produce dovetail joints more quickly and with less effort. The 1:8 dovetail guide

(the traditional ratio for hardwood) clamps in position to hold the saw at the correct place and the correct angle for a perfect cut. ¾" rare-earth magnets imbedded in the aluminum guide



and covered with a layer of low-friction UHMW plastic keep the saw perfectly aligned as you cut. You just need to chop out waste from the tails and pins. Clamps onto material ¼" to 1" thick. Our dovetail saw has been specifically designed for use with our dovetail guide. The 22 tpi blade is 2" x 8½" long and has 0.005" of set per tooth. The dozuki tooth form is effective in both crosscuts and rip cuts. Well-made system. A 1:6 guide (for softwood) is also available.

05T03.02 Veritas® 1:8 Guide and Saw \$35.95

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Hardware Catalog: is available free of charge. Ask for FWH2101.

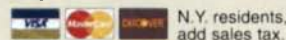
Woodworking Catalog: is \$5 (includes a \$5 coupon) or FREE with purchase. Ask for FWW2101.

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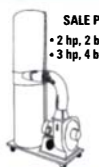
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Tools & Materials



Easy adjustment. Move a rip fence as little as 0.001 in. simply by turning a handle on the Micro-Rip.

Micro-adjustments for rip fences

Getting a perfect table saw cut sometimes means moving the rip fence just a few thousandths of an inch. For most of us, though, the success of such a tiny adjustment has a lot to do with our skill at rapping the fence with the heel of a hand, a technique that has never once been mistaken for anything high tech.

Now there's another way. The Micro-Rip, made by Tahoe Tools, lets you dial the rip fence to the left or right, in increments of 0.001 in. It's designed to work with several fences—the Biesemeyer (commercial and home-shop models), Delta Unifence, General heavy-duty T-square fence and Jet Xacta Fence. The construction of the Micro-Rip is rock-solid, with ¼-in.-thick welded steel the main component.

It took just two screws to mount the Micro-Rip to the commercial Biesemeyer fence in the *Fine Woodworking* shop. The screws attach a small, steel plate to the top of the Biesemeyer fence. Then, the Micro-Rip slips on the front rail of the fence, and a long, threaded rod screws into a welded nut on top of the plate.

Using the tool is pretty straightforward. Just slide the rip fence, along with the attached Micro-Rip, to the approximate position on the saw. (A strip of ultra-high-molecular-weight plastic helps the Micro-Rip slide easier while protecting the tape scale on the rip fence.) Then turn the handle on the underside of the Micro-Rip to clamp it to the fence rail.

Now turn the handle at the end of the threaded rod and read the disc-shaped dial to set the adjustment. No need to worry about backlash (clearance between the threads in the rod and nut that can lead to inaccuracy) thanks to a pair of jam nuts, one of them welded to the dial. Once the adjustment is set, lock the fence and cut.

When you need to use the right side of your rip fence, the Micro-Rip can be removed quickly simply by unthreading the rod from the nut on the plate.

The current price for the Micro-Rip is \$109.95 (shipping and handling included). For more information contact Tahoe Tools (530-525-6486; www.tahoetools.com).

—Tom Begnal

Ready-mix epoxy

I rarely use epoxy. And when I do, the need is usually for just a few, small dabs. So it's a nuisance to measure out the resin and hardener and then mix them. Those syringe-type applicators make things easier, because they dispense equal parts of hardener and resin, but mixing is still required. And the next time I need some epoxy, I find the end of the nozzle has become permanently plugged. Or the dispenser has disappeared somewhere in my shop.

That's why this new product from Elmer's caught my eye. It's a single-use packet that dispenses a small blob of ready-to-use epoxy. The resin and hardener are measured and mixed as you squeeze them from the base of the packet to the top.

It's a no-brainer to use. Place the packet on a hard surface. Then, with the edge of a pencil pressed against the base of the packet, slide the pencil to the top. After that, just tear open the tip of the packet and squeeze out the epoxy.

Expect the Easy Mix epoxy packets to show up in your local hardware store or home center around Jan. 1. To find out more, check with your local retailer or contact Elmer's (888-435-6377). —T.B.



No-fuss epoxy. Elmer's new adhesive packets let you mix and dispense just the right amount of epoxy for small jobs around the shop.

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READER SERVICE NO. 90

Tools & Materials (continued)

Auto-feed screw-gun attachment for drills

The Rapid Fire drill attachment seemed like a great idea when I first saw it demonstrated at a home center. The device fits onto the end of a $\frac{3}{8}$ -in. drill and turns it into an auto-feed screw gun. You can drive 30 screws before reloading.

When I got my own Rapid Fire, I found that it fit only one of my four $\frac{3}{8}$ -in. drills. Most of my drills have very little clearance between the shoulder of the chuck and the motor housing, where Rapid Fire's backing plate must fit.

I was impressed with the initial performance of the tool while doing some drywalling. It occasionally jammed but was easy to clear. After a while I must have gotten a bit aggressive with the Rapid Fire because it suddenly developed a wrist-jarring shudder. I discovered that I had bent the mandrel, rendering it useless for anything other than beating eggs.

I suppose if you're careful, you could get some life out of the tool. (Keep in mind, the instructions warn that it is "not intended for professional use.") Rapid Fire screws are available for drywall, subfloor and decking applications.

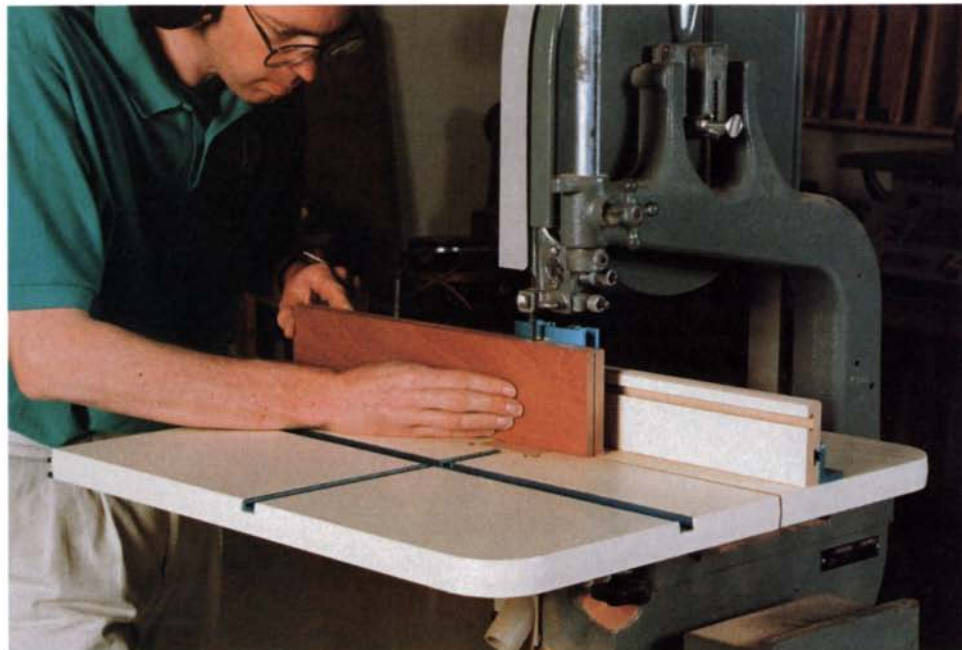
The Rapid Fire sells under the Vermont American label for about \$50 and is available at many hardware stores. The same unit can also be found under the manufacturer's own label, Quik Drive. (Quik Drive also makes a professional-quality auto-feed screwdriver that costs about \$300.)

—Anatole Burkin



Fire at will. Turn your drill into an auto-feed screw gun.

Rockler bandsaw table



Support your local workpiece. With a surface area of 4 sq. ft., this add-on bandsaw table provides you with an extra-large work surface.

Bandsaws for the home shop offer tables in one size only—small. And when cutting curves on a large piece or resawing long stock, a small table provides little support.

A lot of woodworkers simply mount a larger top, usually plywood, to the table. But screwing or clamping the new top to the ribbed underside of the cast-iron table can sometimes be a fussy job. Not only that, the rip fence that comes with the saw won't work once the larger top is added.

Rockler has introduced a 24-in. by 24-in. bandsaw table that includes a rip fence, a single-point fence, a circle-cutting attachment and a slot for a miter gauge. The table is made of $1\frac{1}{8}$ -in.-thick medium-density fiberboard (MDF) faced with melamine. A square MDF throat-plate insert fits into a cutout in the center of the table.

Mounting the table to a 14-in. Delta takes just a few minutes. A steel bar screws to the underside of the Rockler table, then the bar is slipped into the miter-gauge slot on the cast-iron table. A pair of hold-down clamps thread into the bar to keep the top securely in place.

I did notice a bit of misalignment in the top, where there is a long, narrow slot that allows the table to be installed around the blade. But this was an easy fix. I simply screwed a $\frac{3}{4}$ -in. by $1\frac{1}{2}$ -in. by 4-in. cleat

across the slot on the underside of the table, and the surfaces lined up perfectly.

Also, the MDF insert sat a bit below the top of the table. So to get everything flush, I added a few layers of masking tape around the underside of the insert.

The fence slides both left and right in an aluminum track, and a plastic handle locks it in place. You can adjust the fence to compensate for blade drift simply by turning a pair of knurled, plastic knobs.

Like many bandsaw rip fences, the end flexes a little when lateral pressure is applied. Usually this isn't a problem, but if you don't want the end to move at all, secure it to the table with a clamp.

The circle-cutting attachment and optional resaw attachment worked okay. Both can be set up in a matter of minutes.

Keep in mind that adding any table can reduce the resaw capacity of the saw by the thickness of the table. On the Delta, the 6-in. resaw capacity shrank to $4\frac{1}{8}$ in.

The table has one other wrinkle. To change a blade, you must remove the top—a nuisance if you change blades a lot.

All things considered, Rockler's table is a useful addition to any bandsaw with a small table. It's available from Rockler (800-279-4441) for \$149.99. Add \$15.99 for the resaw attachment.

—T.B.

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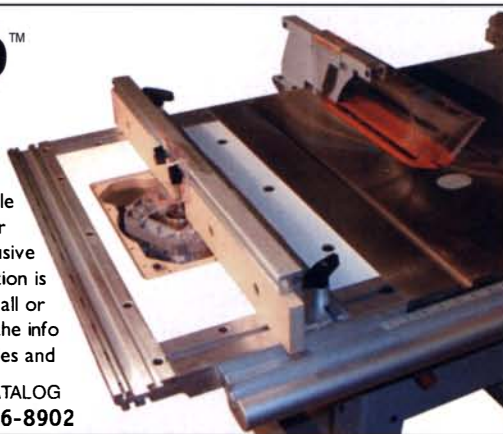


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thru			thru		
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6"	120	22.30	125
6"	180	44.55	250
6"	220	44.55	250
6"	320	44.55	250

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Tools & Materials (continued)

Veritas chisel plane

This hybrid plane is well made and useful. It's designed to accept a 1-in. chisel, which serves as a thick, chatter-free plane iron. But avoid using a chisel that's large and bulky, because it could make the plane top-heavy.

Once the chisel is mounted, you end up with a nice shoulder plane or rabbet plane. The tool can also be used to cut a 1-in.-wide dado, up to a depth of $\frac{3}{8}$ in. Plus, I can foresee using inexpen-

sive 1-in. chisels here, adapting them for specialty tasks, such as plowing grooves for doing inlay work.

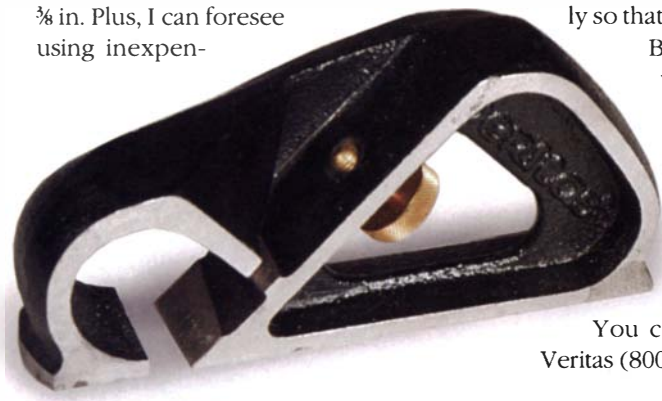
I found the nose of the plane too short for some tasks, like hinge mortising. A second, longer-nosed version would be an ideal companion.

My plane took a little tuning up before it could be used. The sole needed flattening. And the casting had to be reworked slightly so that the chisel would seat properly.

But once tuned, the plane worked very well, holding the chisel firmly in place as I made an assortment of cuts. And adjusting the chisel is easy. To set the depth of cut and lateral alignment, tap the end of the chisel handle with a small hammer.

You can get the chisel plane from Veritas (800-871-8158); it costs \$29.50.

—William Tandy Young



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Gifkins dovetail jig

The Gifkins dovetail jig is a simple, accurate jig designed for making through-dovetails with a router table.

This Australian-made jig was accurate right out of the box. On my first try, it took about 30 minutes to cut nice-fitting dovetails on all four corners of a test box.

The main body is made of a laminated, high-density fiber/resin material with a T-slot in the top. An interchangeable, phenolic template mounts to the base. Sacrificial backer boards, screwed to each side of the body, prevent tearout on the back side of the cuts. Cuts are made with special bearing-guided router bits (supplied) that follow the edge of the template. Dovetail cuts are made with a dovetail bit. A straight bit cuts the pins.

A double-sided stop rides in the T-slot, with one side of the stop on each side of the jig. The T-slot allows the stop to be accurately positioned anywhere along the length of the jig. And because the stop has two sides, the workpiece ends up in exactly the same position when it's moved from one side of the jig to the other.

Removing or adding shims behind the sacrificial backer board



Parts of the whole. The basic Gifkins package includes the jig with backer boards, an adjustable stop, a phenolic template (choose from four options), a straight router bit, a dovetail router bit, extra shims and an instruction manual. The jig is shown mounted to the template that's used with thin ($\frac{1}{2}$ in. or less) stock. The thicker template and bigger bits (right) are used when working with thicker stock.

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Tools & Materials (continued)



The latest jig for through-dovetails. Teamed with a router table, the Gifkins dovetail jig is easy to set up and use.

on the straight cutter (pins) side of the jig will correct an ill-fitting joint. The stop does not have to be moved to change shims, allowing quick adjustment of the jig.

Four different templates are available. The A10 and A20 are used with ¼-in.-shank bits and can cut dovetails in material up to about ½ in. (13mm) thick. The A10 spaces the pins of the dovetails at ⅜ in. (20mm); the A20 spaces them at 1½ in. (28mm). The other two templates (the B10 and B20) are used with ½-in.-shank bits and can cut material up to ⅞ in. (22mm) thick. You get a pin spacing of 1½ in. (38mm) with the B10, and 1⅝ in. (48mm) with the B20.

I'd say the biggest drawback of the jig is the lack of adjustment of pin spacing. To get evenly spaced half pins, you must change the dimensions of the box to accommodate the spacing on the template being used. The template dictates the maximum width of stock: 9 in. for the A10; 12 in. for the A20; and 12¼ in. for the B10 and B20 templates.

The basic unit includes the jig and stop, one template, the special dovetail and straight router bits, extra shims and an instruction manual. It sells for \$249 delivered and is available from The Japan Woodworker (800-537-7820; www.japanwoodworker.com).

—Roland Johnson

Tom Begnal is an associate editor; Anatole Burkin is the managing editor; William Tandy Young is a woodworker and author from Stow, Mass.; Roland Johnson runs a woodworking business in Sauk Rapids, Minn.

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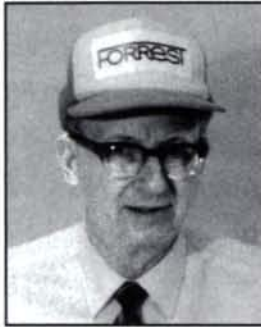
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8" x 40 T (3/32" Kerf)	\$99	\$89	\$84
7 1/4" x 30 T (3/32" Kerf)	\$89	\$82	\$79
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The 10" x40T earned the Editor's Choice for the best performance regardless of price. *American Woodworker* April 1998, pp 68-69.

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When Mistakes Happen

How to fix dings, cracks, splits and more without starting over

BY JEFF MILLER

After reading article after article filled with pictures of flawless work, you might get the impression that experienced woodworkers never make mistakes. I can assure you that isn't true. Pros simply know how to salvage their goofs. What makes me an authority? Well... lots of mistakes, of course.

Sure, I get angry with myself (or at others) when things go wrong. But in a perverse sort of way, I've come to enjoy the challenge of salvaging woodworking disasters. I now have an arsenal of repair tricks at my disposal.

It's important to realize that you can't salvage everything. There are times when you have no other choice but to throw in the towel and start over. But that happens much less than you might think, whether the defects are manmade or natural.

Mental attitude goes a long way toward saving a project that suddenly heads off in the wrong direction. The level of anxiety is always highest the instant you discover the problem. But self-flagellation doesn't accomplish very much. Step back and take a few deep breaths. Do whatever it takes to stop obsessing. Grab a cup of coffee or walk around the shop. Then figure out what went wrong.

It's a good idea to come up with several options to solve a problem. Anything involving a large hammer doesn't count. Then prioritize the options—from the quick and easy to the dreaded scrap it and start over. Don't rush into anything—with one exception. If you're in the middle of a glue-up and notice a major problem, now is the best time to pull apart the piece; before the glue sets. Otherwise, give yourself a little time to think before rushing into a fix. □

Jeff Miller owns a custom furniture shop, writes and teaches furniture making in Chicago.



Stubborn joints cause many problems during dry-fitting or final glue-up. Working from opposite sides a little at a time, use a bench vise to pull apart tight joints.

FIXING STRUCTURAL CRACKS



Overly tight joints may crack when fit together. After disassembly, pare the tenon for a looser fit.

Cracks may develop during dry-fitting and disassembly of parts. They are most often the results of joints that are too tight. Or they may be caused by hidden, internal stresses in lumber. In either case, the fix is the same. Get glue deep into the crack, then clamp it.

Getting glue into a fine crack may be the most difficult part of the job. My favorite glue applicator is a piece of the wrapper taken from a candy bar or bag of snack food. The thin wrapper won't easily tear or get soggy and is readily available. Spread glue on a strip of the wrapper and work it deep into the crack.



Get glue deep into the crack for a good repair. A piece from a snack-food package or candy wrapper can be used to force glue into a crack.

COVERING DEEP SCRATCHES



Don't give up on a piece, even if the damage seems severe. Shopmade veneer can be used to cover up cosmetic damage.

Scratches or gouges may be too deep to remove by sanding. If the part isn't too large, such as a table leg, you may be able to veneer an entire face to cover up a defect. (Veneering just one side of something larger, such as a panel, may cause it to warp.) For a veneer patch, choose stock that matches the original in grain and color. Use your bandsaw to cut an oversized piece of veneer. After gluing the patch, plane or sand it smooth, then chamfer or ease the edges to protect the veneer and to help disguise the seam.



Align the grain of the veneer. Trace the shape using the part to be fixed, and cut it slightly oversized.

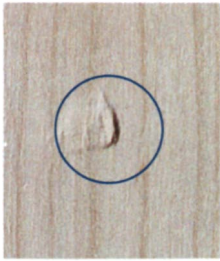


Glue the patch in place. Use cauls to protect the stock from the jaws of the clamps.



Plane the patch flush with the stock. Last, ease the corners to protect the veneer and help blend it in.

STEAMING OUT DENTS



Dents seem to appear out of nowhere. Most are easy to repair, especially if the wood fibers have only been compressed and not severed.

You can sometimes swell compressed wood fibers simply by placing a drop of water right on the dent.

More often, you'll also need some heat to help swell the fibers. A clothes iron turned to a high setting works well. Place a drop of water on the dent, then touch the tip of the hot iron to the water. As the water turns to steam and rises, the wood fibers swell. The process may have to be repeated a few times. Severed fibers may call for additional work—either filling or patching in addition to steaming.

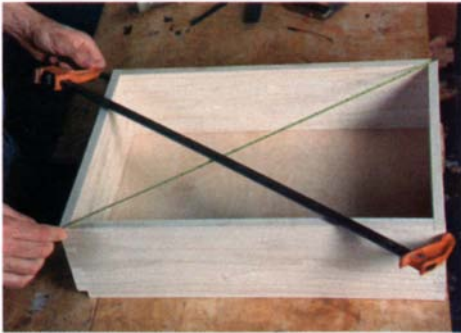


Place a drop of water on the dent. Don't flood the area. Repeat as necessary.



Touch only the tip of the iron to the spot. The steam swells the wood fibers and returns them to the surface.

ALIGNING PARTS



Despite careful preparation, when the clamps come off after a glue-up, nasty surprises occasionally surface. Among the most common problems are out-of-square drawers and carcasses.

If a drawer or case looks more like a parallelogram than a rectangle, the bottom (for a drawer) or back (for a case) can be used to bring it square. First, measure the diagonals, then place a clamp corner to corner on the longer diagonal (see the photo above). Pull the box until the diagonals are equal and install and glue or screw in the drawer bottom or back panel.

FILLING DEFECTS WITH SAWDUST

Many types of commercial fillers are available for repairing small defects. Most of them, however, look just like fillers once they've been applied. For a more natural look, apply a drop of cyanoacrylate glue directly to a defect, and then sand immediately with 220-grit or 320-grit sandpaper. You might have to repeat the process after about 20 minutes to fill in a larger defect. This is a little sneaky. The repair is not at all invisible; it usually looks more like a natural blemish, such as a pin knot or a mineral deposit.

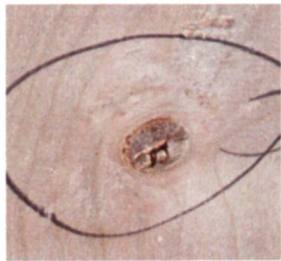


Cracks may be the result of natural defects. A screw driven too deeply may also cause them.

Place a few drops of cyanoacrylate glue on the crack. Then sand over the area with fine (220-grit) paper. Repeat as needed.



PLUGGING KNOTS



Although it's best to avoid stock with knots, there are times when you're down to your last board foot of lumber. All that's keeping you from completing a project is a dime-sized knot. A defect that large can't be filled, but it can be removed and plugged with another piece of wood. Look through your pile of offcuts and find a piece containing a pin knot. The grain around knots usually swirls and curves, features that help disguise the repair. Use a tapered

plug cutter to remove the pin knot (the patch) and then set the patch into place, orienting the grain for the best appearance.



Drill out the defect. The pin-knot patch (right) was bored out from scrap stock using a tapered plug cutter.



Apply glue and tap the patch in place. The old knot was drilled out at an angle to remove as much loose material as possible.



Work away at the patch. Plane cautiously over the knot to avoid tearout. Switch to a scraper when the patch is nearly flush.

Finish off with sandpaper. Sometimes a dab of dye, slightly darker than the surrounding wood, is needed to blend in the patch.



REPLACING EDGES

When a piece of wood breaks off an edge, and the piece gets lost, you can still salvage a part as long as you have some matching wood. It's not enough to use the same species. You must find a piece that has similar grain and color. If you can cut and replace wood along the grain lines, the patch will be practically invisible.



Slice off the ragged edge, leaving a smooth, flat surface. Cut a patch with a table saw tilted at an angle.

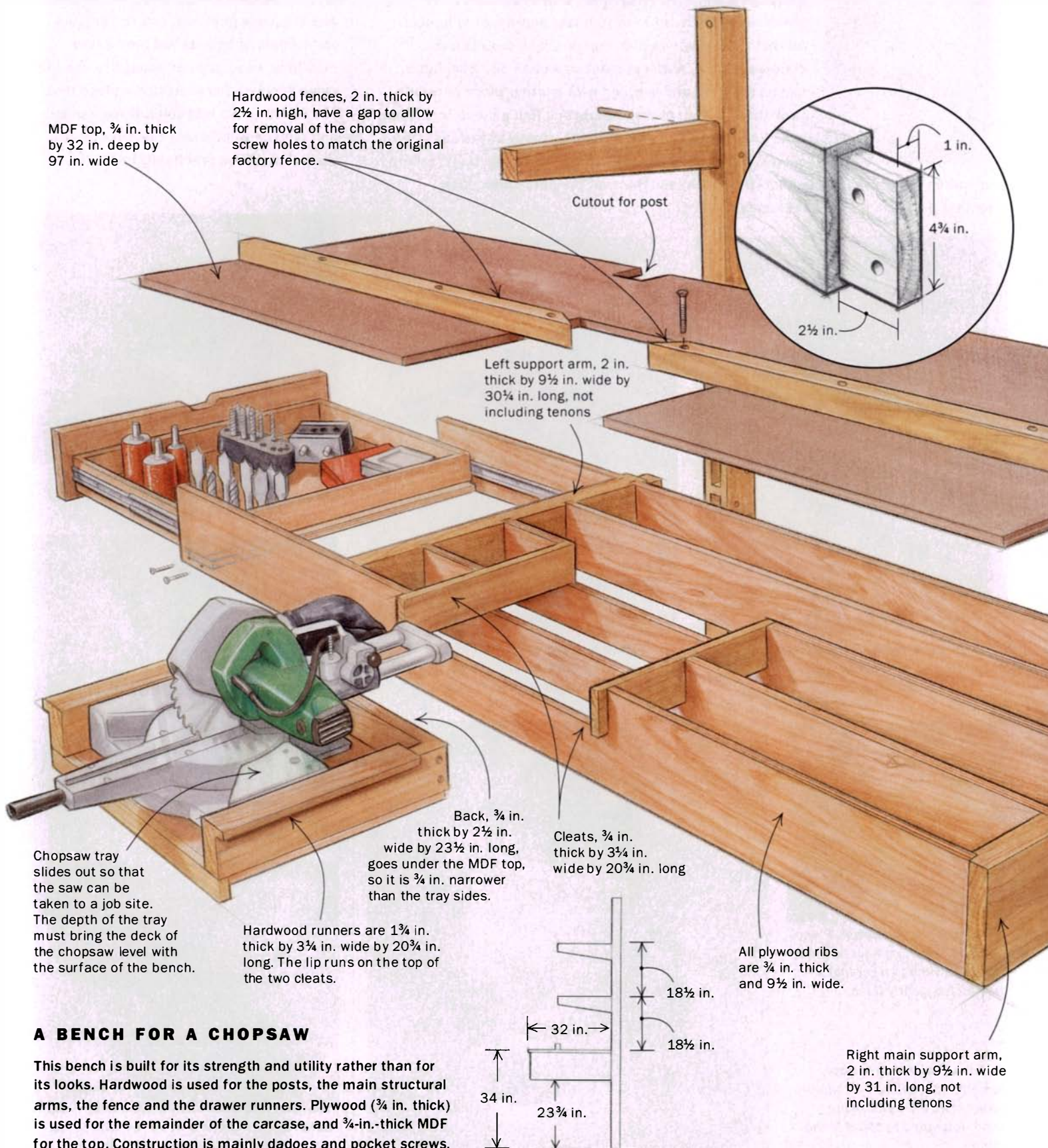


Glue the patch in place and hold it with masking tape. It is easiest to work with an oversized patch.



Remove the excess material. Use the tool of your choosing: a chisel, plane or sander.

Stack and Saw Lumber



A BENCH FOR A CHOPSAW

This bench is built for its strength and utility rather than for its looks. Hardwood is used for the posts, the main structural arms, the fence and the drawer runners. Plywood ($\frac{3}{4}$ in. thick) is used for the remainder of the carcass, and $\frac{3}{4}$ -in.-thick MDF for the top. Construction is mainly dadoes and pocket screws.

on the Same Rack

BY CHRIS GOCHNOUR

Storing lumber effectively is a challenge in any shop, but it's especially challenging in a small shop. When I designed my current lumber rack, the efficient use of space was a priority. I wanted my lumber to be accessible and close to the chopsaw, where I cut it to rough length. Gradually, I developed the notion of a combination crosscutting table and lumber rack. While I was at it, I decided to make the chopsaw easily removable so that I could take it to installations.

The rack's framework consists of two hardwood posts and a series of cantilevered arms that hold the lumber and support the crosscutting table. The posts are lag-bolted to the stud wall. I chose bolts

ery for these arms, stacking two tenons for each arm rather than making a very wide one. This improves the joint because less material is removed from the post, which minimizes the risk of splitting. It also avoids wood-movement problems that can occur with wide tenons.

The arms for the chopsaw table have a series of dadoes cut on the inside faces to accept plywood ribs that support the tabletop. I made the top of the table out of medium-density fiberboard (MDF), because it is very flat and a good utility work surface. I also built a hardwood fence with stops for repetitive cutoff work.

The chopsaw is mounted on a small tray that slides into place and is secured with

Cantilevered arms and a built-in chopsaw table provide plenty of storage, easy access and efficient crosscutting in a small space



long enough to give me 3 in. of threads in the studs, and I mounted the posts 6 ft. apart to correspond with the wall studs.

The arms, also hardwood, are tenoned into the posts and secured with glue and draw-bored pegs. I chose to taper the arms so that I could have the strength of a large tenon mounted into the posts but more room for lumber on the outside. For ease of assembly, I glued the arms into the posts before bolting the posts to the wall.

The arms that support the crosscutting table are almost twice the width of the others and are not tapered. I modified the join-

two screws. With this setup, I can remove the two bolts and take the saw with me. In the shop, my fence replaces the factory fence. But when I take the saw on the road, I remount the factory fence.

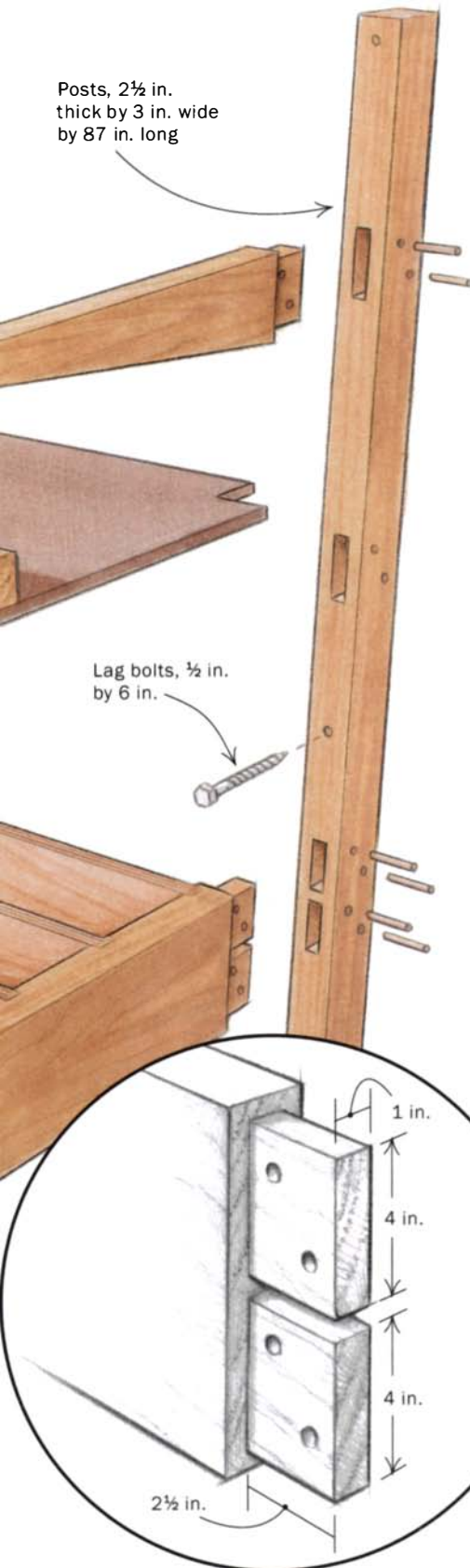
My drill press is just a few feet away from the table, so I installed a drawer at one end to hold drill bits and drill-press accessories.

My rack is just inside the large door I use for bringing lumber into the shop. I simply back in my truck and unload lumber right onto the rack. Let the work begin. □

Chris Gochnour is a furniture maker in Salt Lake City, Utah.

Posts, 2½ in. thick by 3 in. wide by 87 in. long

Lag bolts, ½ in. by 6 in.



Turning Bowls from Green Wood

The material is a joy to work, and checking *can* be prevented

SIX REASONS FOR TURNING GREEN WOOD

BY HOWARD LEWIN



1. Fresh logs are often free



2. There's a wide selection of species



3. Large blanks are easy to come by



4. It cuts fast with little dust



5. It's easy to turn thin walls and unconventional shapes



6. Final shape changes during drying

I've heard it too many times, even from expert wood turners: Don't bother with green wood. Sure, it's wonderful to turn, but the bowls always crack. Well, they're wrong. It is possible to turn and dry green bowls successfully, and you won't need any polyethylene glycol (PEG), complicated procedures or other hocus-pocus to do it. There are just a few techniques to be mastered and a couple of tricks to be learned. Soon your success rate will make green wood fun and worthwhile.

The lure of turning green wood has always been strong. I can think of at least six good reasons why you should try it. First, freshly downed logs are often free. This lets you experiment and grow as a turner without worrying about cost. I live in Los Angeles, where tree trimmers have to pay to dump their loads. I let them dump wood at my studio. They grind up the small branches and sell that as mulch. I keep the logs, freshly cut and delivered free. Even if you can't swing a deal like mine, you can probably meet your local tree trimmer on site and take some logs away. Less work for him.

Second, the selection of green wood is almost unlimited. Wherever

you live, a variety of species is available to turners who keep their eyes and ears open. Third, you're not limited in size to what's in the lumberyard. Ask your local lumber salesman for a 12-in. by 12-in. by 12-in. walnut bowl blank. You'll get a blank look.

Fourth, turning green wood is more pleasant. New wood is softer, making the cutting easier and faster. Tools stay cooler, keeping them sharper longer. Green wood produces less dust and creates larger shavings, which are easier to pick up. Green bowls can be wet-sanded, which creates no dust at all. And green wood is easier to cut with chainsaws and bandsaws. Shall I go on?

A fifth reason to turn green stock is that it allows total freedom. Because the wood is soft and cuts easily, bowls and vessels can be shaped with very thin walls. End-grain



vessel shapes become not only possible but also easy. One of my favorite shapes includes the bark and the center of the log, with heartwood bull's-eyes on the sides. These forms are very difficult to achieve with dry wood. Also, when the wood dries, the pith sometimes bulges out in an interesting way. And that's the sixth benefit: The final shape of the vessel is often undetermined. Once the piece has been set aside to dry, mystical changes take place. I have had bowls almost close and others twist like a pretzel, all without cracking. And there are tricks for manipulating the final shape in strange ways.

Getting started

Now you know why you should try green wood, but you need to understand how. It starts with a chainsaw; I recommend having two. Use a gas-powered one for felling and cutting up trees, and get an electric one for use in your shop. There's no exhaust, and it's easier on your ears (and your neighbors') on a leisurely Sunday morning.

Watch out for nails in wood that was in a yard or near a road, and cut logs about 6 in. longer than you need, to allow for checking. Most beginners run into trouble cut-

ting the log down the middle. This is an important cut in preparing green wood for turning, because many bowl forms are made from log halves or quarters. Also, it lets you get at the center of the log if you plan to remove the middle 2 in. or 3 in., which contains the pith and the densest heartwood. This pith heartwood, as I call it, is the area most likely to split, so its removal will help prevent checking if a blank must be stored for a while.

When cutting a log lengthwise, the temptation is to set it on end and cut down. This is slow going because you are cutting into end grain the entire length of the log. Lay down the log and cut parallel to its length. You'll get longer shavings and a faster cut. To prevent dangerous kickback, never tilt the chainsaw bar forward while its tip is engaged in the wood. Clear the long shavings often so they don't bind the chain. And be sure to prop the log so that it won't roll. When you're almost through the log, roll it over or set it on end to finish the cut.

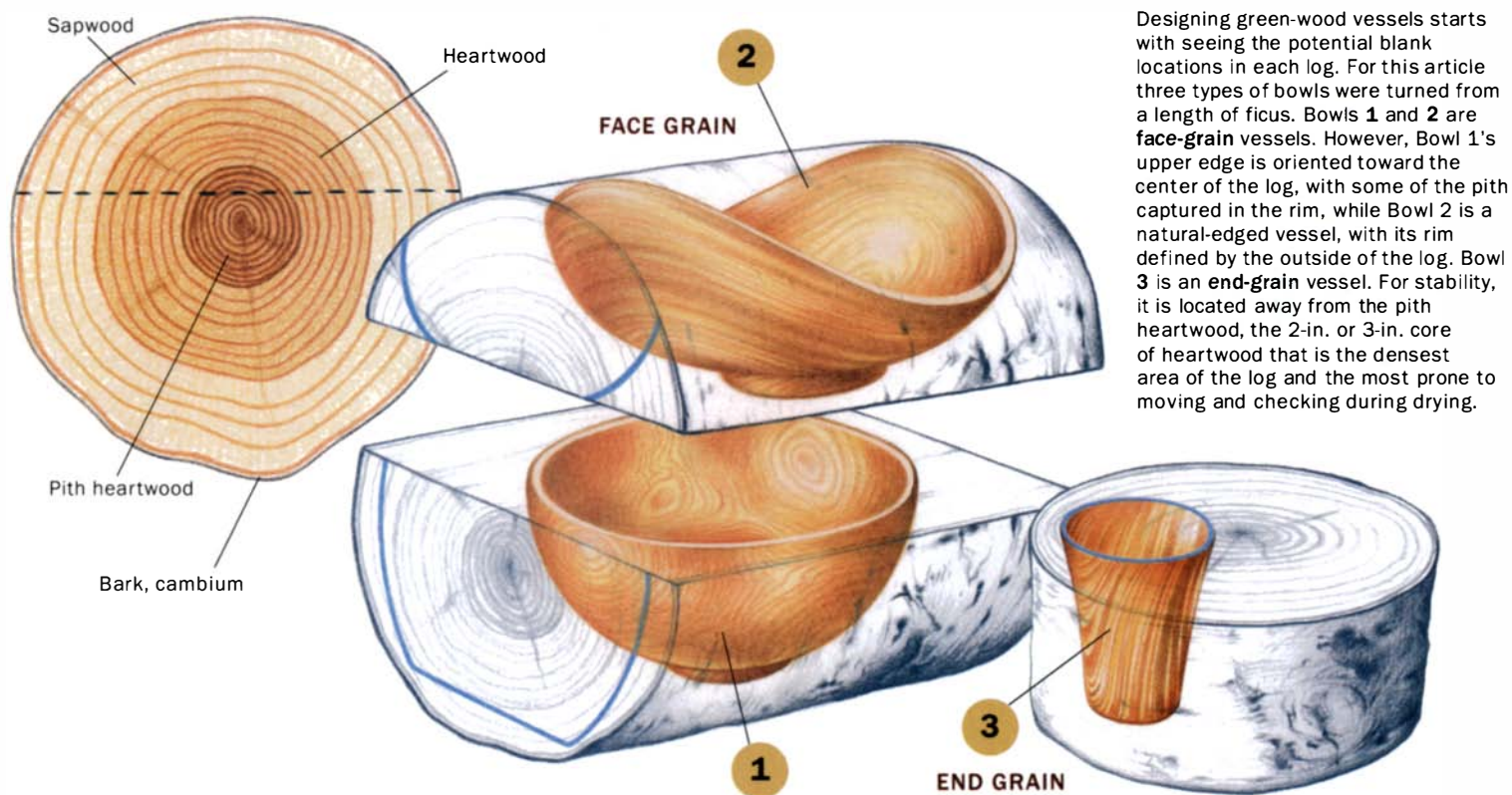
Don't cut the wood into blanks until you need them. Work from one end of the log, and keep the ends of the log sealed with



wax or paint. Don't expect a log to stay check-free for more than a few months, depending on local heat and humidity.

Use a bandsaw to cut log halves into blanks. Don't overload your machine. If you can afford it, you'll need a bandsaw that can cut about 12 in. high with a 20-in. throat and a 2-hp motor. Most of what you turn will fit into this dimensional range. Use a skip-tooth blade with about three or four teeth per inch. A hook-tooth blade

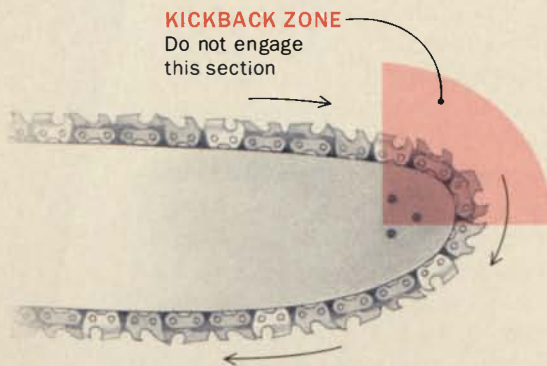
LOCATING BOWL BLANKS WITHIN THE LOG



Designing green-wood vessels starts with seeing the potential blank locations in each log. For this article three types of bowls were turned from a length of ficus. Bowls 1 and 2 are face-grain vessels. However, Bowl 1's upper edge is oriented toward the center of the log, with some of the pith captured in the rim, while Bowl 2 is a natural-edged vessel, with its rim defined by the outside of the log. Bowl 3 is an end-grain vessel. For stability, it is located away from the pith heartwood, the 2-in. or 3-in. core of heartwood that is the densest area of the log and the most prone to moving and checking during drying.

CHAINSAW RELEASES BLANKS FROM LOGS

The first step in turning a green bowl is chainsawing. A 16-in. bar is big enough for most work yet easy to handle. The author uses a gas-powered chainsaw outdoors and an electric one inside. As always when chainsawing, beware of kickback when the tip of the bar is buried in the wood.



CROSSCUTTING



The first slice gets rid of small checks at the end of the log. Any cracks must be eliminated, or they will grow later during drying.

The next crosscut establishes the length of the blank. Be sure to raise the log off the ground slightly to protect the saw teeth, and wedge it to prevent rolling.



Use a marker to plan your bowl-blank locations. This ficus log will yield two face-grain bowls, one with the pith heartwood near its rim, and the other with natural (bark) edges. Ficus, known commonly as a narrow tree used for interior decoration, grows quite large in warm climates.

CUTTING LENGTHWISE

Lay the log on its side. Placing the log on its end to make the cut (inset) means you'll be cutting into end grain the entire way. The sawdust will be fine, and the going slow. Cutting the log on its side will be much easier. Clear the long shavings often by lifting the saw out of the cut. When the saw's tip is buried in the wood, never tilt the bar forward or dangerous kickback will result.



will not shed wet sawdust well. I use an old tablesaw blade to mark an outline on the blank. Then I cut away as much of the unnecessary wood as possible.

Choosing blanks—A word here on locating bowl blanks in the log. With face-grain bowls, there is going to be some distortion during the drying process no matter what you do. However, the farther away from the pith heartwood, the less a face-grain bowl will move. With end-grain bowls and vase forms, there's very little movement, especially in wood away from the center. Personally, I like to include the pith heartwood in the bowl. The subsequent movement adds mystery to the final piece. I often mount the pith-heartwood side on the faceplate and turn natural-edged bowls so that the heartwood and its color are in the bottom and wall of the bowl.

Seal the end grain of green turning blanks and keep them out of the sun. But don't put them in plastic bags. They will begin to rot, and you'll never get that odor out of the wood. If you want spalting, set one end of the log on soil and wait a few months. Leave it there too long, and you'll get complete dry rot.

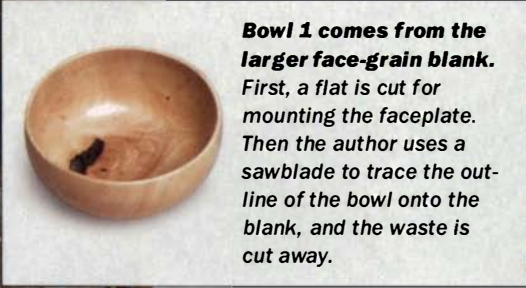
Mounting techniques—Three- and four-jaw chucks and expansion chucks tend to crush green wood. A screw chuck (simply a heavy wood screw protruding from a flat plate) is a viable alternative, but the bottom of the blank must be very flat to snug up against the plate. Also, green wood provides weaker threads than dry wood for this type of chuck. However, a bit of cyanoacrylate glue in the screw hole will add some holding power.

The best and safest mounting device is the faceplate. For most bowls, a 3-in. plate is sufficient. There should be at least six screw holes, large enough for #10 screws. I use 1-in. or 1¼-in. drywall screws with coarse threads for most bowls; they work great. Generally, use longer screws for end grain, because the threads don't grab as well there. And it's a good idea to flatten the blank's mounting surface.

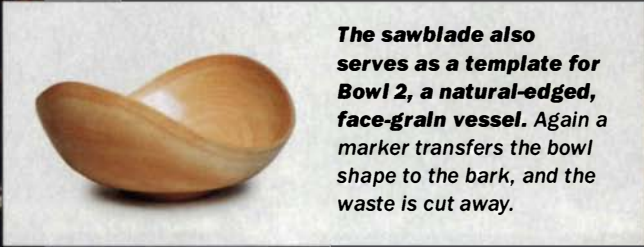
A few general tips on turning bowls: A variable-speed lathe is great because it lets you gradually adjust the speed right up to the point before the lathe begins to vibrate. Adjust the speed and the tool rest often, keeping the leverage point as close to the work as possible. An excellent safety pre-

BANDSAWING THE BLANKS

After chainsawing the log, the bandsaw is your next stop. Remove as much waste as possible while keeping the blank somewhat balanced. A large bandsaw and a massive lathe are nice to have, but smaller equipment just means smaller vessels.



Bowl 1 comes from the larger face-grain blank. First, a flat is cut for mounting the faceplate. Then the author uses a sawblade to trace the outline of the bowl onto the blank, and the waste is cut away.



The sawblade also serves as a template for Bowl 2, a natural-edged, face-grain vessel. Again a marker transfers the bowl shape to the bark, and the waste is cut away.



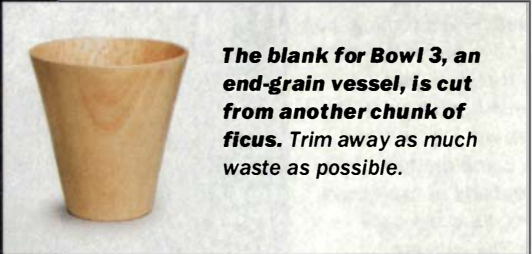
caution is to keep the lathe's drive belts loose enough that they will slip when the gouge gets caught in the work. This has prevented many disasters in my shop.

Turning the outside—Slide the tailstock and live center up against the blank for added holding power while roughing and shaping the outside of the bowl. Use long, hefty bowl gouges as opposed to scrapers, which will cause tearout. Examine the wood carefully for any checks or cracking. All checks must be completely turned out, or they will grow later.

When cutting on the inside or outside, choose the direction of your cut carefully. Avoid cutting against the grain, which will cause tearout and grab the tool.

Thin, even wall is the key

Once the outside of the bowl has been shaped, slide the tailstock away and begin the hollowing process. Turn the bowl to a uniform wall thickness of $\frac{1}{4}$ in. to $\frac{1}{2}$ in.—thinnest for harder woods, which move more. To gauge wall thickness as you work, check the light passing through the wall of the bowl and listen to the tool res-



The blank for Bowl 3, an end-grain vessel, is cut from another chunk of ficus. Trim away as much waste as possible.

onate on the wood. The uniform thickness of the wall and bottom is one of the keys to success with green wood. As the bowl dries, it will do so evenly. Another key element is the thin wall. With most of the mass gone, the wood can relieve stress by moving freely rather than cracking. Whatever the thickness, however, it must be consistent throughout the vessel.

Once you begin hollowing, speed is of the essence. The bowl will start changing shape as it gets thinner and begins to shed water. There is no time for a coffee break at

this stage. With practice you will be able to turn a 12-in. bowl in 30 minutes. Start by plunging about 1 in. to $1\frac{1}{2}$ in. into the center of the bowl and moving outward to the wall until $\frac{1}{4}$ in. is left. Repeat this process, leaving $\frac{1}{4}$ in. at the wall each time.

This method leaves strength and rigidity at the base of the thin wall you are cutting. Do not hollow out the bowl and then try to retrace your steps and thin out the wall. It will be too soft and flexible for cutting.

There is an important difference in technique for hollowing end-grain and face-

TURNING THE BOWLS: FACE GRAIN VS. END GRAIN

Today's long, heavy, deep-fluted bowl gouges slice easily through green wood, with thick shavings streaming off the blank. The shearing action leaves bark edges intact and works well on interrupted cuts, such as when the blank is being roughed. A note of

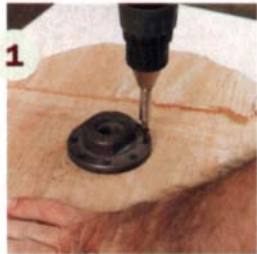
caution for green wood: Work your way out to the thin wall and then leave that edge alone as you move deeper into the bowl. Returning to a thin edge turned previously is dangerous because it already will have started to dry and move.

FACE GRAIN

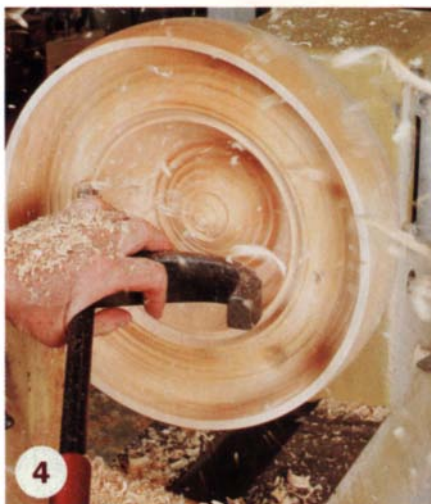
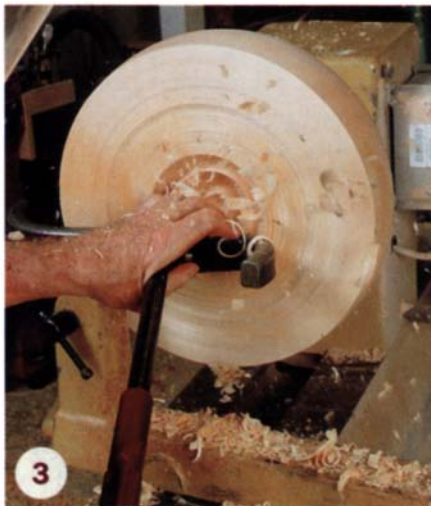
END GRAIN



Rough the outside with the tailstock and revolving center jammed into the workpiece for added support. 1. Use a faceplate to mount green wood on the lathe. Other



mounting devices won't grab the soft, wet fibers as well. When turning, be careful to direct the cut with the grain, not against it; otherwise, the fibers will tear out and may catch the tool. 2. For the outside of face-grain bowls, as is the case here, the cuts are pushed from the center and bottom toward the outside and top of the bowl (here left to right). 3. For hollowing, the tailstock is pulled out of the way. After a small plunging cut is made at the center, each successive cut begins at the outside edge of the last cut and moves in toward the center. 4. Leave $\frac{1}{4}$ in. of wood at the wall, then begin the next series of cuts at the center again and work out to the wall, and so on.



Cuts are made in the opposite direction for end-grain vessels. 1. Outside roughing cuts move from the rim of the vessel toward the bottom, here from right to left. 2. Then the tailstock is pulled away, the tool rest is reoriented, and hollowing cuts are plunged in at the center and pulled back toward the wall. 3. When $\frac{1}{4}$ in. of wood is left at the wall, the next cut begins at the center again, and so on. 4. With today's



sharper, longer gouges, scrapers are not needed for the final cut on any surfaces. A planing cut, made with the tool's bevel riding along the surface just cut and acting as a lever point, leaves an even surface for sanding.

grain bowls. For an end-grain bowl, after plunging into the center, pull the cut toward you and away from the center. This way, the fibers you are cutting are supported by the fibers behind them, and you are not cutting directly into the grain. For a face-grain bowl, do the opposite. After plunging into the center, start at the outside of the plunged hole and cut away from yourself, toward the center of the bowl.

When nearing the bottom of the bowl, leave only the overall bowl thickness (usually 1/4 in.) between the inside surface and the tips of the screws used to mount the bowl. Later, when hollowing the bottom of the bowl, go just far enough to turn out the screw holes, and the bottom thickness will be right.

After turning the bowl, allow the surface to air-dry before sanding. Leaving the bowl on the faceplate for a day is usually sufficient, depending on conditions, but a few hours might do in hot, dry weather. If you power-sand, as I do, put the lathe on a slow speed and don't apply too much pressure in one area. Any heat buildup will cause the bowl to crack. Wet-sanding is also fine, especially if you don't have time to air-dry the bowl's surface.

I like to leave a foot on the bottom of my vessels. To finish this type of bowl, jam- or reverse-turn the screw holes out of the bottom and hollow out the foot, continuing the uniform wall thickness into the foot as shown at right. For a round bottom, you just turn off the bowl with a parting tool. Don't power-sand the bottom; it is prone to cracking and should be left until the bowl is completely dry.

The trick to drying

Place the wet bowl into three brown supermarket bags, one inside the other, and wrap each tightly. If your area of the country is drier or more humid, three bags may be too many or too few. I've found Los Angeles to be a three-bag town (there's a joke there somewhere). Do not use plastic bags. Check the bags periodically. When the bags are bone-dry, the bowl is dry. That's it. The bags slow the drying process, allowing moisture to leave the bowl slowly. This process can take anywhere from one or two days to three weeks, depending on location, season and wall thickness. If you have chosen your bowl blanks for movement, as I often do, mysterious events take place inside these brown bags.

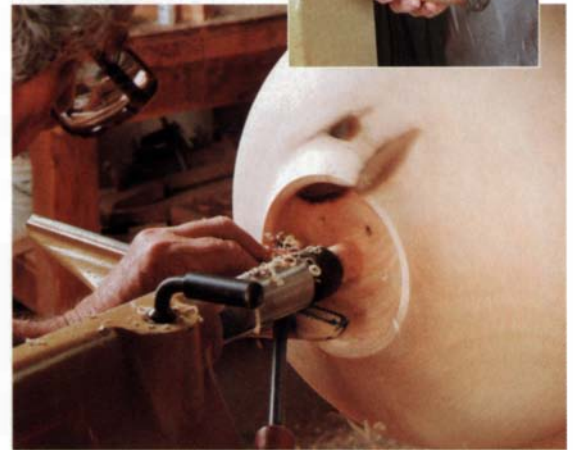
FINISHING UP

The bowl is sanded while still on the faceplate, then the faceplate is removed, and the bowl is reversed and mounted on a jam chuck for turning the foot. Controlled drying comes next—then a final light sanding before finishing.



REVERSE-TURNING

A jam chuck is screwed on for reversing the mounting position and turning the foot of the bowl. A hardwood block with a rubber foot attached makes an effective jam chuck. Turn the foot until the screw holes disappear. At that point, the bottom of the bowl and the sides of the foot should be the same thickness as the wall. This uniform thickness will allow the bowl to relieve stresses as it dries, preventing cracks.



SANDING

Give the bowl about a day to air-dry before sanding it. If you choose power-sanding, don't linger too long in one area or the bowl will heat up and crack in that spot.



Another drying technique is to nuke the bowl in a microwave oven. However, a microwave can't vent moisture well, so you will have to make many trips to the oven, giving the bowl one-minute bursts on the high setting, and taking it out each time to let off steam. I can accomplish the same thing with paper bags without any of the effort. The upside to microwave heating, though, is that you can bend the hot, thin walls toward each other, for example, like a pitcher. You will have fun explaining how you turned the bowl this way.

Here's the bottom line

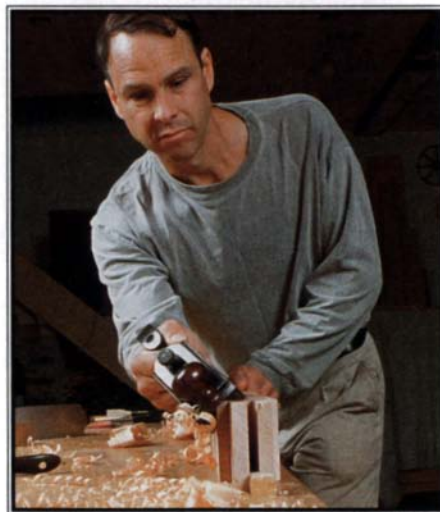
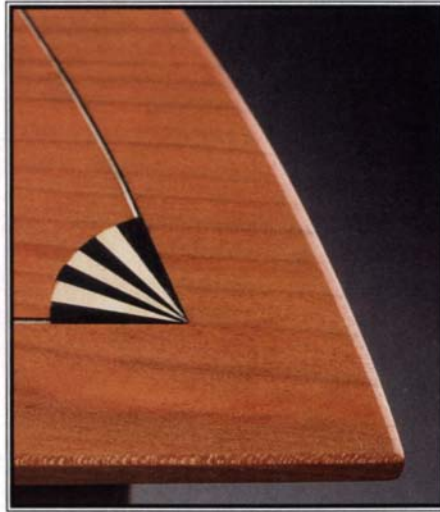
Cut your blank out of a green log, the wetter the better. Turn the whole bowl in one session, keeping the wall thin and uniform. Sand lightly. Allow the bowl to dry in paper bags, sand lightly

again, if necessary, and apply a finish. That's it. The true test is to go out to your shop and try it. The wood is free, and the design possibilities are endless. □

Howard Lewin is woodworker and woodworking teacher in Los Angeles.



Chamfers



Where and why to use beveled edges,
and how to cut them with hand tools

BY GARRETT HACK

Time is hard on furniture. The wear and tear, bumps and bruises that add character to some furniture can just as easily leave it disfigured, depending on the degree of damage. How gracefully a piece of furniture ages has to do with many aspects of the design, not least of which is how you deal with the edges. If you leave edges sharp, in time they'll be rounded over and chipped away, probably not as you intended. Cut a chamfer—a bevel across the edge, however small—and the edge will be more apt to keep its shape. Also, chamfers generate interesting

shadow lines that can create a sense of depth or lightness, and they offer one more surface to decorate and add detail to your work.

Look at almost any style of furniture closely, from curvilinear Art Nouveau to rectilinear Craftsman, and you'll see different sizes of chamfers. Shakers used them on the edges of lipped drawers, as a simple molding (alone or in opposing pairs) or to outline a curved table leg. Federal and Chippendale furniture sometimes have chamfers on the outside corners of chests of drawers to reduce their visual mass.

The block plane is fast and reliable. Shown here shaping the top edge of a small table, this tool is lightweight and easy to adjust. By holding one finger under the body of the plane, you can control the angle of the cut for a consistent bevel.

Chamfers are both practical and decorative. By cutting a chamfer, you create a new edge that reflects light differently than either of the two surfaces it joins. It catches your eye by highlighting the shape of a curve or by subtly altering a sense of scale. I've used chamfers to make large parts, such as square tapered legs, appear more slender. A chamfer cut along each corner of the leg gives it a slimmer look. Similarly, a chamfer can outline a shape and draw attention to it. A shadow line can also have the opposite effect, such as the feeling of greater depth on a shallow molding, much the same way the field in a raised panel can appear more raised than it really is.

Cut wide chamfers along the outside edges of a chest of drawers to make the case appear more slender, and you've created a place for some decorative detail. Scratch in some reeds or flutes, or add an inlay or two. Carve an end to your chamfer with a neat flourish such as a lamb's tongue or a curved stop. Chamfers are small surfaces to let go with your creativity.

Cut chamfers with your choice of tools

Unless you are cutting large chamfers or one to some exacting specifications—such as those on a tapered pencil post—you don't have to be all that meticulous about cutting chamfers symmetrically or consistently. Your eye might notice some variation in the width of a chamfer but not slight changes in the bevel angle along its length. In fact, some slight irregularity makes a chamfer more visually appealing.

I cut most of my chamfers freehand with a block plane, guiding it with my hands and body. A block plane will cut a clean chamfer around a convex curve; but for a really bold curve or a concave one, a flat- or round-soled spokeshave is a better choice. Stanley once made a small chamfering shave (No. 65) with adjustable guides to help cut consistent or wide chamfers around curves. But for large chamfers and clear-cut accuracy, the Stanley No. 72 chamfering plane is the ideal tool. It can also be fitted with a beading attachment to cut moldings or inlay grooves within a wide chamfer. For stopped chamfers and decorative flourishes, a chisel, small files and a scraper will suffice.

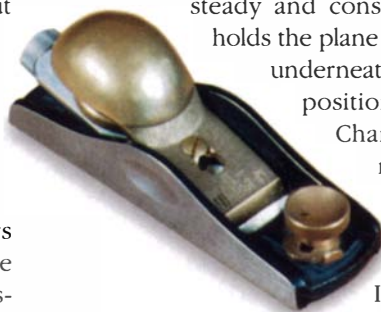
Block planes—Typically, I use a block plane to cut chamfers around the edges of a tabletop, either straight or curved (see the photo above). Chamfers are often cut at a consistent 45° bevel, es-



pecially when breaking a square corner, but that's not a rule written in stone. One advantage of working with hand tools is that you can fine-tune the chamfer angle and depth as you progress. When it looks right, stop. When you start to cut a chamfer, the first few passes let you get a feel for what it will look like and how the grain of the wood is behaving. You may need to change the cutting direction along an edge to prevent tearout and get a perfectly smooth and polished chamfer.

When working freehand with a plane, you must clamp the workpiece in place, so that you can use both hands to make steady and consistent planing strokes. One hand holds the plane in position, the other guides it from underneath, and both are somewhat locked in position by the upper body and arms.

Changing the bevel angle is then just a matter of repositioning hands and body. For more accuracy, scribe light pencil lines along the edge and top surface to define the cut. If I have lots of chamfers to make, I'll





Spokeshaves are good for concave curves. Lightweight enough to use with one hand, this Stanley No. 54 has an adjustable mouth to help control the depth of the cut.

sometimes use two block planes—one set for rapid wood removal, and the other for a light, polishing cut.

Spokeshaves—I turn to a spokeshave when I have to cut a chamfer on a tight or concave curve (see the photo above). A flat-soled spokeshave works fine most of the time, unless the curve is too tight, in which case a shave with a curved sole works better. The technique is the same as using a block plane, except that the two long spokeshave handles can be an advantage for keeping the tool steady and at a consistent bevel. The challenge—especially with a curved edge—is to keep the tool cutting smoothly for the final cut.

Getting the feel for the task comes with practice, learning how to rotate the shave into or out of the cut.

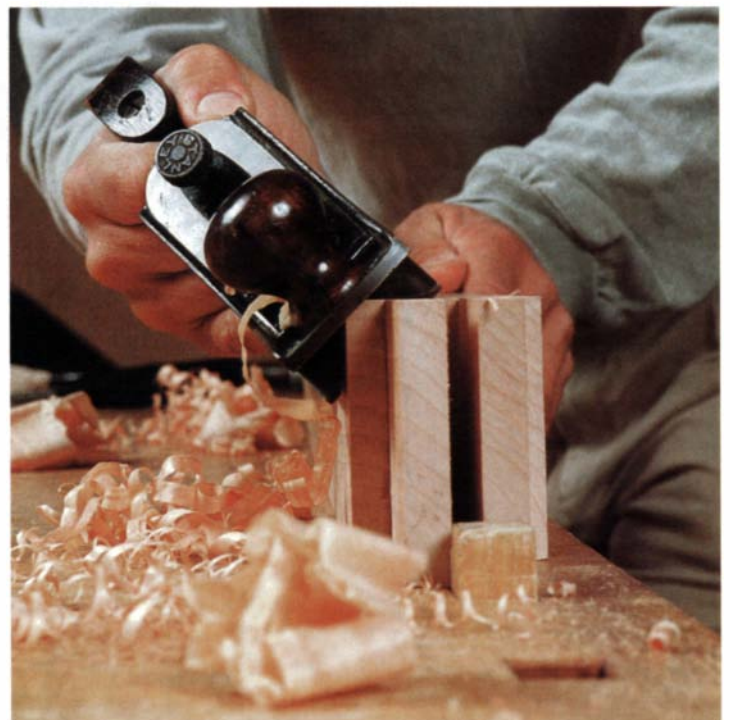
I rarely use the Stanley No. 65 chamfering shave, but it can cut precise chamfers along curves because it has two guides that ride along both sides of the cor-



ner, the width between them determining the width of the chamfer. (Kunz makes a similar shave sold by Woodcraft.) Being able to shift the guides is a nice feature because you can use fresh areas of the cutting edge, not just the center. This tool still requires a bit of operator control, but with the guides in place, it gives you chamfers at a consistent width and a true 45° bevel.

Chamfering planes—When furniture makers worked entirely by hand, plane makers responded by devising many specialty tools, such as chamfer planes, to do the work more easily or accurately. Stanley produced the No. 72 (see the photo below) with an unusual, angled sole that rides securely along any square edge. (You can still occasionally find this tool at flea markets and auctions.) The cutting iron and small flat sole at the front of the plane adjust up and down to cut any width of chamfer and act as a depth stop. Some wooden chamfer planes are still available; either used English versions or modern Japanese planes.

The beauty of these planes is the ease with which they will cut a consistent bevel along a straight edge. I recently used the No. 72 to run some large chamfers along the stretchers and posts of a long trestle table, where uniformity was an important aspect of the design. As with the chamfering shave, the tool rocks around when getting started and is firmly guided by the sole only when you get close to the final cutting depth. Over the years I've found that I can work nearly as accurately with a block plane, or



This old tool cuts with the accuracy of a router bit. The Stanley No. 72 chamfer plane was designed for cutting chamfers. The original also came with an attachment that fits on the front of the plane and accepts specialized cutters for dressing up the chamfer with beads or coves.

for longer chamfers, a No. 4 bench plane, without all the set-up fuss that the No. 72 demands.

Bullnose rabbet and chisel planes—If you have a frame-and-panel door, a chamfer cut along the inside of the stiles and rails makes a simple yet elegant transition from frame to panel. Chamfering all of the inside edges of a drawer makes it more user-friendly and helps it slide more smoothly upon the runners. With doors and drawers the chamfers are best cut after assembly, but doing so makes it more difficult to work cleanly into the corners.

This task is made easier by the right tool.



The Stanley No. 90 bullnose plane is a good choice for cutting inside chamfers (see the photos below). The mouth designed to cut rabbets and the small sole ahead of the iron are especially useful for working in tight spots. Also, the entire top at the front of the plane can be removed to convert the tool into a chisel plane. I start inside chamfers with a few quick cuts, roughly defining the miter and scoring the long-grain

fibers of one side to prevent any tearout later. I then cut the chamfer as close to the corner as I can and pare away the small amount



Use the Stanley No. 90 bullnose plane for cutting inside chamfers. Start inside chamfers with a few quick cuts, then cut close to the corner. Pare away the remaining wood by using the tool as a chisel plane.

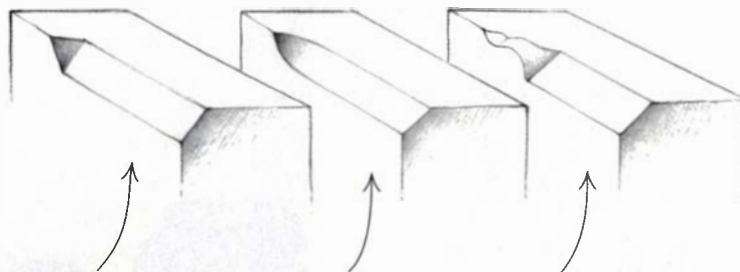
of wood remaining by using the tool as a chisel plane. It's important to make only light cuts and to keep the pressure toward the back of the plane to prevent the iron from digging in too much.

Decorative details add charm to chamfers

You can cut chamfers all the way along an edge and miter them together at corners, but there are times when it's neater to stop the chamfer. Take, for example, the chamfered corner of a cabinet

carcase that has moldings along the base and under an overhanging top. If you cut a bold chamfer all the way along the corner of the cabinet, that would make it run right under the top molding and behind the mitered corners of the base molding. The result would be an unattractive gap behind the mitered moldings. A stopped chamfer will prevent this problem. A stopped chamfer

STOPPED CHAMFERS



A plain stopped chamfer is usually made with a clean chop of a chisel.

A curved stopped chamfer is made with a spokeshave or carved with a knife.

A lamb's tongue is carved with a chisel and shaped with rasps and scrapers.

is also appropriate when you want to preserve an unchamfered area on a bedpost where it has been mortised for a rail. Luckily, there are several ways to end chamfers that are wonderful details in themselves (see the drawings above).

The easiest way to end a chamfer is with a square chop, but a more elegant way is to make a gradual sloping cut. You can curve this slope on both concave and convex shapes, or a combination of the two—as in one of my favorites, called a lamb's tongue (see the photo at right). Before cutting the chamfer, carefully lay out where the stops are and make a few trial cuts to see what shape fits. Wasting some of the wood at the stop before cutting the chamfer is not a bad idea. Depending upon the shape of the stop, you can cut it with a spokeshave, chisel or small files, but be careful not to overdo it.



Shaping a lamb's tongue. After marking the location on the workpiece, this fancy stop detail is carved entirely by hand, using chisel, rasp and scraper.

Within wide chamfers on higher-style work, it's not uncommon to see chamfers taken one more step to molded details or an inlaid line. If you can find one, the Stanley No. 72 has a beading attachment to hold scratch cutters for just this sort of work. You could also make your own basic wooden one. Whether you end up cutting some highly decorated chamfers or simple ones with a few quick strokes of a plane, time will treat those chamfered edges more kindly. □

Garrett Hack is the author of The Handplane Book and Classic Handtools (The Taunton Press, 1997 and 1999, respectively).

Nail Guns for Cabinetry

A guide to using finish nailers, brad nailers, pin nailers and staplers

BY ROLAND JOHNSON

Nails enjoy a long history in woodworking. Although many of today's craftsmen, unlike their Pilgrim counterparts, avoid nails in fine furniture, these fasteners still have a place in cabinetry. But you won't see a lot of hammers swinging in cabinet shops. Today's woodworker has at his disposal all types of pneumatic guns for driving finish nails, brads and staples. These tools allow you to work faster, suffer less fatigue, align parts more accurately and won't mar a workpiece the way an errant hammer blow might.

The range of choices in pneumatics is great. But for cabinet work, there are only four categories of guns worth considering: finish nailers, brad nailers, pin nailers and staple guns. Each type of gun is best suited for specific tasks. Don't expect one to do everything.

Finish nailers

A finish nailer is the largest gun a woodworker would need. Most weigh around 5 lbs. and can shoot nails up to 2½ in. long. Many finish nailers on the market have an angled nail carriage, which makes it easier to install molding in tight quarters and to do overhead work, such as installing crown molding. A finish nailer can cost from under \$300 to well over \$400.

The nails for this type of gun



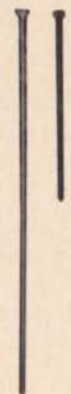
FINISH NAILER

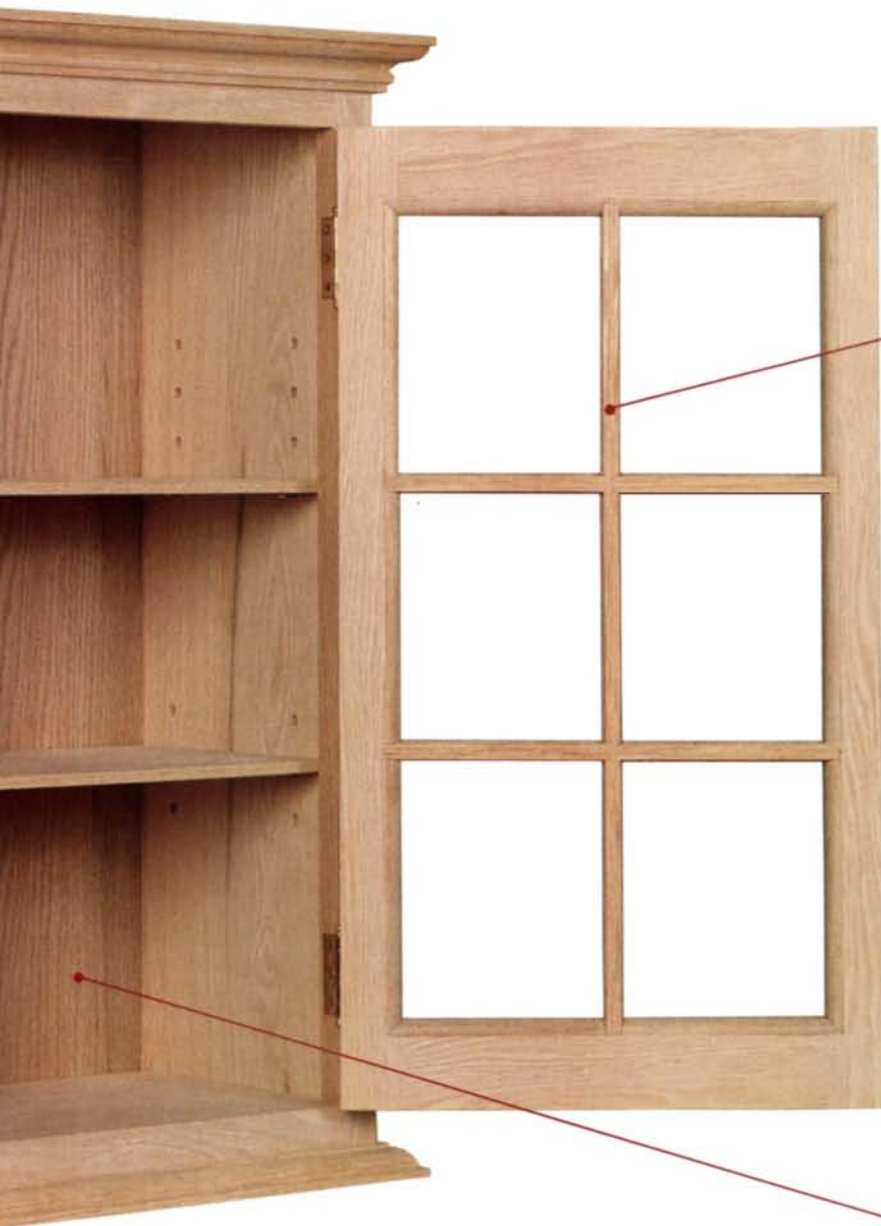
Used for cabinet carcass construction, face-frame attachment, door jams, casing, baseboards, plinth and corner blocks, large crown moldings, jigs and fixtures. Guns come in 15-gauge and 16-gauge models and fire nails from 1¼ in. to 2½ in. long.



BRAD NAILER

Typical uses include cabinet molding construction and attachment, casing at the jamb edge, cabinet backs, beaded wainscot as well as jigs and fixtures. Fires brads from ⅝ in. to 2 in. long.





PIN NAILER

Used for attaching delicate molding and stop molding for glass. They are also useful for holding trim in place while glue dries where clamping would be awkward. The lightest type of nailer fires 23-gauge headless pins ranging in length from ½ in. to 1 in.



STAPLE GUN

Uses include attaching cabinet backs made of plywood thin enough that a brad might blow right through and for small jigs and fixtures. Staples range in length from 7/8 in. to 1½ in.



How much air do you need?

If you are not ready to go to the expense of plumbing your shop for compressed air or even buying a compressor, a portable air tank is an adequate substitute. The author's 6-gal. air tank can be filled at a gas station and has more than enough capacity to complete a small cabinet.

Stray nails and gun safety

Make sure your hands are out of the path of a driven nail. I shot a nail into the side of my hand while holding a piece of wood that wasn't as thick as the nail was long, and I can still remember the pain. Always make sure you are aware of the length of nail loaded in the gun. If the nose of the gun has to be held at an oblique angle to nail some molding, the path of a nail may follow the grain and go off its intended course. Pulling the nails through usually causes further damage. It's best to cut the nail with nippers, recess the nail with a nailset and fill the hole.

Treat a nail gun as you would any gun. Ear protection and eye protection are important. Nail guns emit a loud exhaust report each time the gun is fired, especially the large finish guns. Be aware of where the exhaust port is on the gun, because the exhaust can blow sawdust or other debris with considerable force.

A nail can glance off the workpiece if the nail gun is held at too severe an angle or can ricochet off a hidden piece of metal such as a screw head. Always be aware of anyone around you when firing the gun, and make sure they are not in the path of the nail if it were to go slightly astray. Never disable the safety.



Not where he intended. The nose of the gun is angled so that the nail would enter the side of the cabinet and not penetrate the inside. Unfortunately, this angle combined with the grain of the molding to steer the nail out of the side of the cabinet.



A clean snip. The neatest way to cover up an errant nail is to snip off the protrusion as close to the wood as possible.



Punch it home. Sink the stub of the nail with a narrow-headed nailset.

are typically 15 or 16 gauge, roughly the diameter of hardened finish nails. Many of the 15- and 16-gauge nails have a polymer coating that lubricates the nail as it is driven and bonds it to the wood when it cools. This feature is great for holding parts together, such as cabinet carcasses, but makes the nail almost impossible to pull out if you make a mistake. For exterior applications, nails are also made in aluminum or stainless steel to avoid rusting.

Brad nailers

A brad nailer is smaller and lighter than a finish nailer and shoots 18-gauge brads from $\frac{3}{8}$ in. to 2 in. long. A brad nailer is ideal for small moldings, installing cabinet backs or other applications where a small-diameter, small-headed nail is needed. A brad nailer is in the \$100 to \$200 price range.

One thing to note about brad nailers is that some guns have a wider nose than others (see the right photo above). Wide-nosed guns may make it difficult to place nails in tight quarters.

Pin nailers

A pin nailer is roughly the same size as a brad nailer, but it drives headless 23-gauge pins, ranging in length from $\frac{1}{2}$ in. to 1 in. Use a pin nailer for delicate molding applications, such as stop molding for glass, or in situations where filling the nail holes would be a chore or the moldings would be split by countersinking a brad head. A pin nailer is also useful for holding trim in place while glue dries where clamping would be awkward. Pin nailers range in price from \$75 to more than \$125.

Staple guns

A staple gun is my choice for attaching cabinet backs made of plywood, where a brad might blow right through. Staples also help keep splitting to a mini-



Different noses. Although both are brad nailers, the model on the left has a smaller nose than that on the right, which makes precision nailing easier.

mum when fastening near the end of a board.

The average woodworker can get by with a gun that handles $\frac{1}{4}$ -in. crown staples, from $\frac{7}{8}$ in. to 1 $\frac{1}{2}$ in. long. There are staple guns that can handle $\frac{1}{2}$ -in. crown staples, but these guns are more suitable for upholstery work. You can buy a staple gun for around \$100.

Air supply

Pneumatic nailers are not big consumers of compressed air. A small air compressor will supply all the air needs of any finish, brad or pin nailer or of any staple gun. An inexpensive method of getting into pneumatic nailing is to get a portable air tank, which can be filled at a local service station. I have a 6-gal. model fitted with a regulator and coupler that I use for small projects. A tank this size has more than enough capacity to complete a small cabinet like the one shown on p. 59.

Maintenance of a pneumatic nail gun is easy. Many guns do not require lubrication. For a gun that does need lubrication, simply trickle a few drops of oil into the air inlet of the tool each day before it is used. Do not use too much oil, because the excess could be sprayed onto the workpiece and cause finishing problems. □

Roland Johnson is a woodworker who lives near St. Cloud, Minn.



A Light Settee in Cherry

Straight lines simplify the design,
and a woven seat adds character

BY MATTHEW TEAGUE

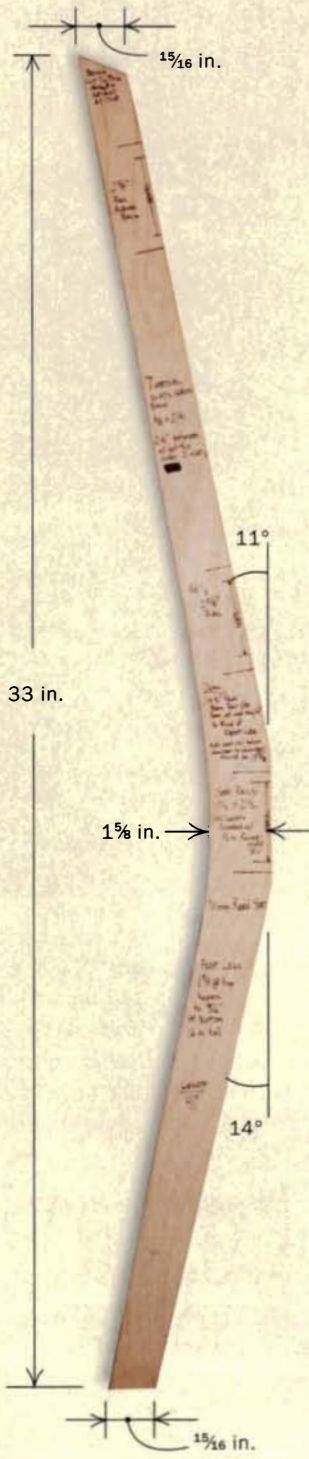
I can't draw well, but it's never kept me from trying—on newspapers, leases, whatever happens to be in front of me. And when I needed a coffee table, I was drawing them everywhere. One design began on a Post-it note while I was on the phone—which may explain, in retrospect, its odd transformation. When one table leg turned out a little canted, I drew another line off the back, making it a chair. Then when I tried to turn the chair-like doodle into a perspective drawing, the lines were too long—yet further proof that I can't draw. But when I looked back down, my coffee table had turned into a vaguely elegant settee. I drew little cross-hatched lines across the seat and was rather pleased.

I spent a bit more time on later



LEG TEMPLATE SERVES AS A STORY STICK

All mortises can be marked directly from a story stick, which is simply the rear-leg template marked with mortise locations and notes on construction. Should you ever want to build the bench again, the layout information is in one handy place.



One board, four legs. Nesting the two rear legs allows you to cut all of the legs from one 10-in.-wide 8/4 board. The legs are bandsawn to shape after layout.



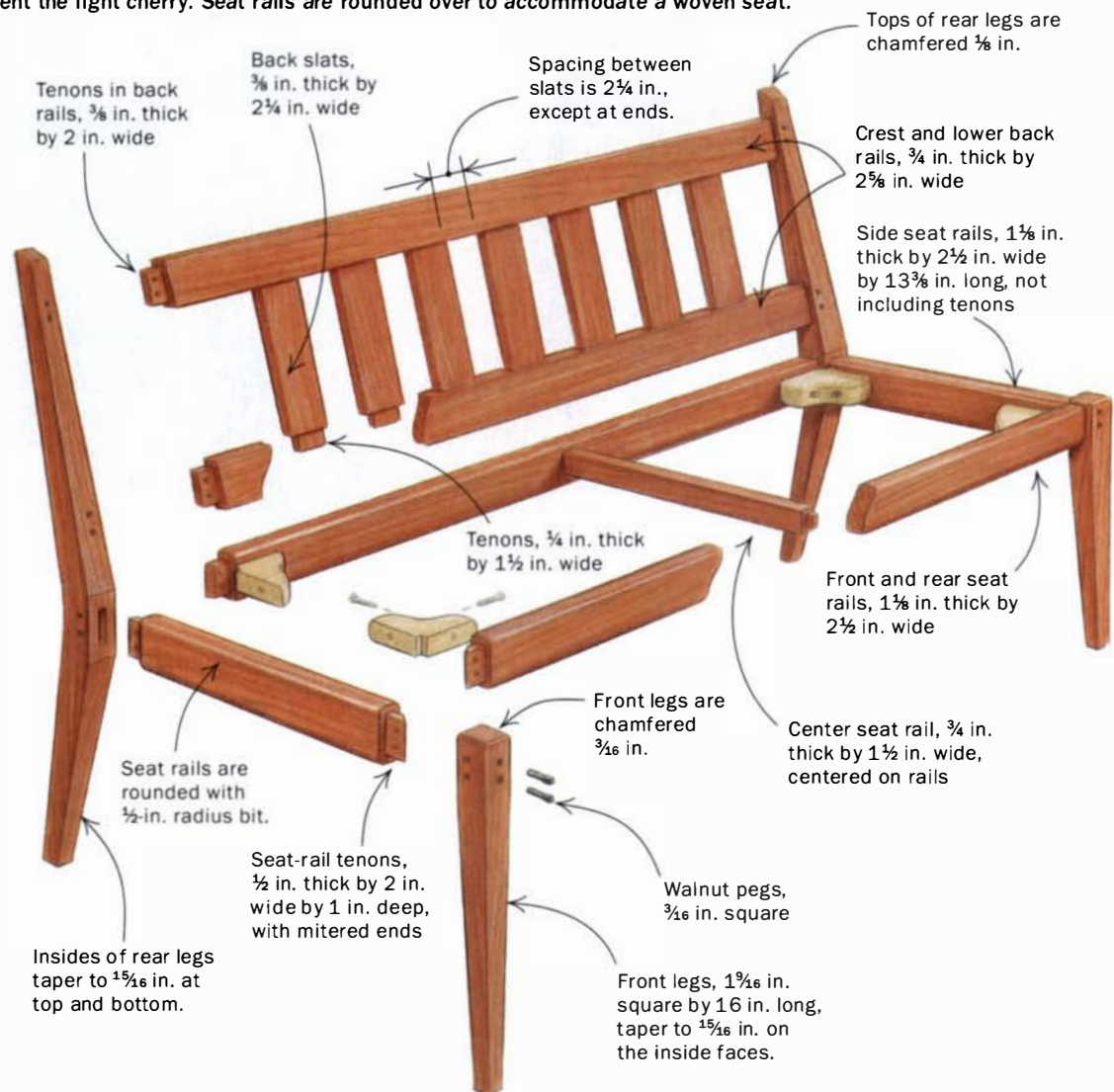
A perfect match. Clamp the two rear legs side by side, then hand-plane them smooth. Do not plane an angle into the flat surfaces where the seat rails join the legs.



Fair the transition curve. The curve at the back of the leg is smoothed with a spokeshave. Any slight tearout can be cleaned up with a card scraper.

A BENCH FOR TWO

This design uses mortise-and-tenon joinery throughout, with square walnut pegs to accent the light cherry. Seat rails are rounded over to accommodate a woven seat.





Mark out the legs. Tick marks on the front of the legs indicate which faces will be tapered after the mortises are cut.



A story stick saves time. Layout is simplified by marking out all mortises directly off the rear-leg template.



Cut the mortises for both legs at the same time. Use a router and edge guide, and clamp the legs together to provide a larger bearing surface for the baseplate.

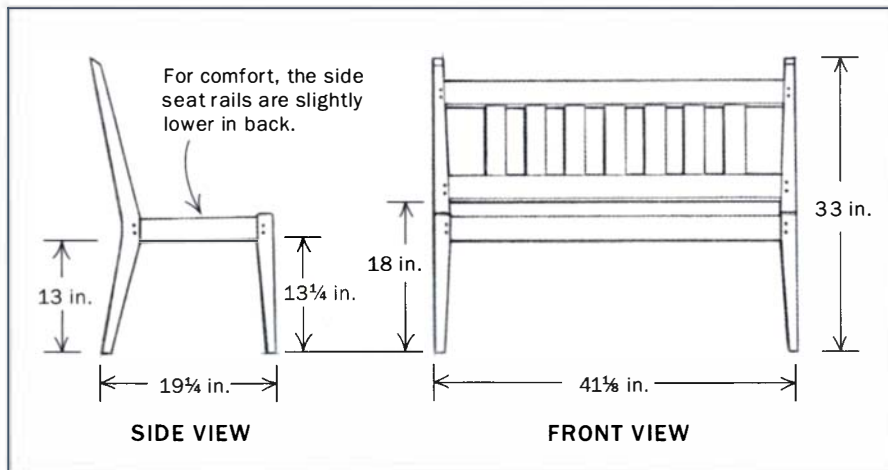


Square up the mortises. When cutting mortises with a router, you either have to chisel the mortises square or round over the tenons.

drawings: I designed a stretcher system, tried two dozen shapes for the back and various seat treatments, but in the end I kept returning to the Post-it note sketch of my coffee table. I liked its lightness and the simplicity of its straight lines. I bumped up the size of the seat rails to avoid using stretchers and to give the undercarriage a more delicate look. And I chose to use a woven seat for its light appearance.

My settee appears rooted in the Shaker and Arts and Crafts traditions, but the woven seat and walnut accents lend the piece a contemporary look, which suits my tastes. It's a small, low bench, perfect for an entryway or along a short wall.

Building this settee calls for only about 15 bd. ft. of wood—8/4 for the legs, 5/4 for the seat rails and 4/4 for the back. I chose cherry because it is easily worked with hand tools and because its light color lends the unimposing look that I wanted the piece to have. But the design would work just as well using other woods.



Shape and mortise the legs

I always make templates for the rear legs of chairs and benches. I mark out all of the mortises and write down construction notes on the template itself. This way, if I ever want to make the piece again, I have a reliable story stick. For this piece, I made a template for the rear legs by bandsawing the profile out of plywood and cleaning it up with files, planes and a spokeshave.

To make both the front and rear legs of this piece, you need only a single 8/4 board about 40 in. long and 10 in. wide. Mill the stock down to 1 5/8 in. and then lay out the rear legs, one nested

against the other. The offcuts will provide enough stock to mill the front legs.

Rough out the profiles of the rear legs on the bandsaw, then clean up the front surfaces with a handplane. Because the fronts of the two rear legs are the reference surfaces for locating the mortises, they must line up perfectly. Clamping the two legs together while handplaning is an easy way to ensure matching legs.

After the flats of the legs have been handplaned, shape the curve at the back of the legs using a spokeshave. Take light cuts and work with the grain, and as soon as the wood begins to tear out, try shaving from the other direction. Light tearout can be cleaned up with a card scraper.

Before laying out the mortises, check the grain direction of the legs and mark which surfaces will get tapered later—you don't want the tapers to fight against the grain. Also, label the tops of the legs as front, rear, left and right.

Before tapering either the front or rear legs, mark out and cut the mortises for the seat

rails as well as those for the crest and lower rails on the back. This way you can rout to a flat-bottomed mortise, even though the shoulders on the back-rail tenons will be angled later to match the taper of the legs. The mortises for the seat rails are 2 in. wide and 1/2 in. from the outside of the legs. The mortises for the back are 2 in. wide and 5/8 in. from the front of the leg.

I cut the seat-rail mortises using a 1/2-in. straight bit and an edge guide mounted on my plunge router. Clamping two legs together provides a wider flat surface for the router to bear against as you cut. Be sure to stop the router exactly at the mortise line. Work the



Mark tenon shoulders from the assembled back. With the rear seat rail clamped in place, make sure the assembly is square, then clamp the crest and lower back rails into place. The tenon shoulders, which are angled slightly to match the leg tapers, can be marked directly off the leg.

router back and forth in the mortise, dropping down only about $\frac{1}{8}$ in. with each pass, until the mortise is a hair over 1 in. deep. The mortises for the back are cut using the same method, but with a $\frac{3}{8}$ -in. straight bit and slightly deeper. I square up the ends of the mortise with a chisel, but you can just as easily round over the corners of the tenon.

Tapering the legs—Though the settee has a rectangular seat, tapering the inside of the legs makes it appear as though the back flares outward. The back legs taper from full width $\frac{3}{4}$ in. above and below the seat-rail mortises to $\frac{1}{2}$ in. at the top and bottom. Leaving a flat surface where the seat rail joins the leg allows you to use simple, right-angle joinery.

Place the handplaned surfaces on the bandsaw table and cut the tapers on the inside of the legs. While at the bandsaw, go ahead and taper the front legs. The bandsawn surfaces are smoothed with a handplane. To ease joinery, be sure you don't change the angles of the flat areas where the seat rails join the legs.

Cut and tenon the seat rails

Because this piece has no stretcher system, the seat rails must be meaty, and the joinery tight. Mill the seat rails to $1\frac{1}{2}$ in. thick and cut them $2\frac{1}{2}$ in. wide. After the rails have been cut to length, tenon them. I used a horizontal router table similar to (and inspired by) Ernie Conover's setup on pp. 68-69, but you can cut the tenons using a handsaw, bandsaw, tablesaw or whatever method you're accustomed to. I cut tenons to the full

depth of the mortise, then trimmed the tenons at 45° on the ends. Mitered tenons provide more glue surface.

A center rail reinforces the woven seat. Locate the center of the front and rear seat rails and cut mortises $\frac{1}{2}$ in. deep by $\frac{1}{2}$ in. wide by 1 in. long to accept the center rail. The rail, made of $\frac{3}{4}$ -in. stock, is positioned $\frac{1}{2}$ in. below the height of the seat rails. If the seat ever sags with age, it will sag into a handsome two-seater with clearly delineated bucket seats—a look I've wanted to emulate since seeing it on an old English Arts and Crafts settee.

All of the edges of the seat rails have to be rounded, because the reed lengths will break if you try to bend them around the sharp corners. Round the edges of the rails using a $\frac{1}{2}$ -in.-radius roundover bit at the router table.



Cutting angled shoulders. After the bulk of the tenon has been cut on the router table, backsaw to the angled shoulder line. Quick work with a chisel trims away the excess.

Join the back to the legs

Once the seat rails have been tenoned, dry-fit the back and clamp it up to make sure that the joints close up and that the assembly goes together squarely. Then lay out the crest and lower back rails and clamp them into place on the legs. Working from the clamped-up back, mark out the angled shoulders of the tenons.

Tenon the back rails slightly short of full depth, then backsaw to the line at the shoulders. A little cleanup with a chisel and shoulder plane helps the joint close up tightly.

The crest and lower back rails are mortised to accept the back slats. To lay out these $\frac{1}{4}$ -in.-wide by $1\frac{1}{2}$ -in.-long mortises, find the centers of the two back rails, then clamp the two pieces together with their

centers aligned. Use a square to mark out both sets of mortises at once. Cut the mortises about 1 in. deep.

To get a quartersawn look on the back slats, I resawed them from 8/4 stock I had left over from the legs. After tenoning the slats, hit the surfaces with a handplane and dry-fit them to the back rails.

Glue up one section at a time

To make sure there won't be any surprises during the glue-up, dry-fit the entire piece. With clamps in place, check to see that all of the joints close up, and fix any trouble spots.

After a successful dry-fitting, start gluing the back slats into the crest and lower back rails. You'll need only a few clamps to pull the joints closed. Glue the back and rear seat rail to the rear legs and set the assembly aside. Then glue the long front seat rail to the front legs.

Once the front and back assemblies have dried, make sure that the side rails still fit easily into place (excess glue can dry in the bottoms of the mortises). Brush glue onto the ends of the tenons and into the mortises, and don't forget the center seat rail as you join the front to the back. Clamp up the assembly and let it dry.

When the glue has cured, glue and screw thick corner blocks into place. Though the corner blocks are set about 1/2 in. below the top of the seat rails, it's a good idea to round over their edges. This way, should the seat ever sag, the reeding won't rub against sharp edges, possibly cutting into it.

Add decorative pegs and apply a quick finish

After the corner blocks have been glued and screwed into place, I pegged the structurally important tenons using square walnut pegs, which accentuate this design nicely. Use a brad-point bit to drill 3/16-in.-dia. holes through the legs and into the tenons, then square up the front third of the hole using a chisel.

To make the pegs, rip a scrap of walnut just shy of 3/16 in. deep on adjacent sides, leaving a sliver of wood to hold the strip in place. Then cut the 3/16-in.-square strips away from the stock and cut them to 2-in. lengths. Round over the end and lower half of each peg with a small carving knife. Put a drop of glue on the ends of the whittled pegs, and use a metal hammer to tap them into place. Stop hammering when the peg bottoms out (you'll hear a difference in tone), or you risk splitting the leg. Cut off the ends of the pegs with a small saw, then use a chisel or low-angle block plane to trim them flush to the legs.

I've tried countless combinations of varnish and oil on cherry, and all of them seem to work fine, though recently I've been using Minwax Antique Oil Finish. A mix of varnish and oil, this finish goes on quickly and easily and seems foolproof to me. Wipe on the first coat with a rag, give it 10 minutes to dry, then buff it off with a dry rag before the surface gums up. After the first coat dries, sand it with 400-grit paper, apply a second coat using 600-grit paper instead of a rag, then buff the coat dry. The finish is buttery soft but still pretty dull after two coats, so wipe on another coat with a rag, give it 10 minutes, then buff the surfaces dry. As you add coats in the same manner, the finish begins to build—the more coats, the glossier the finish.

Weave the reed seat

Perhaps it's because I remember gathering oak splints with my grandfather, who wove baskets on slow Sunday afternoons, but



Square pegs in round holes

The dark walnut pegs lend a subtle accent to this cherry settee. Driven through the tenons, the pegs also ensure that the joints stay tight.



Squaring a drilled hole. Begin by drilling through the leg and tenon with a bit just smaller than the width of the peg. Make sure you don't drill through the other side of the leg. Use a 3/16-in. chisel to square up the first third of the hole.



Making peg stock. Rip adjacent sides on a small strip of walnut—3/16 in. wide and just under 3/16 in. deep. Leave a sliver of wood at the corner to keep the strip from shooting out of the tablesaw. The sliver also makes it easier to pull away the square peg material from the stock.



Whittling pegs. With the pegs cut into 2-in. lengths, round over the first third with a small knife. Rounding the ends of the pegs prevents them from splitting the legs.



Driving it home. After applying a small amount of glue to both the peg and the hole, tap the peg in place with a hammer. Keep the peg aligned and stop hammering when the peg bottoms out (you'll hear a change in tone); otherwise, you risk splitting the leg.

WOVEN SEAT FINISHES THE SETTEE



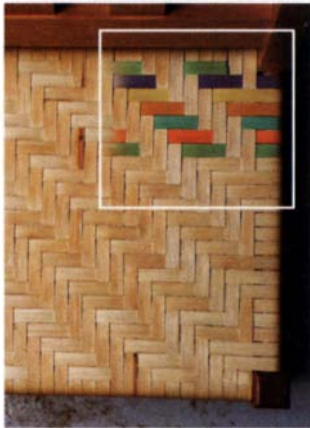
Right-side up. By bending the reed to a tight curve, one side will fray while the other won't. Orient the frayed side so that it can't be seen.



Securing the reed. Begin by tacking a length of reed to the seat rail at the rear left corner of the seat.



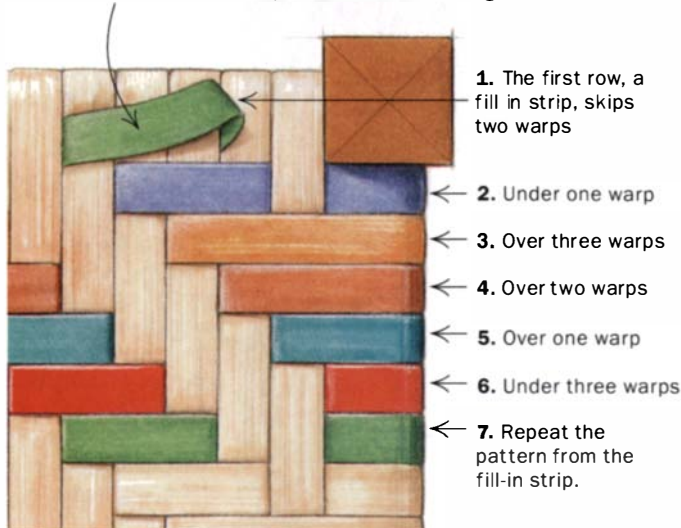
Beginning the warp. The first length of reed goes under the front seat rail and over the back and continues in this way to the end of the seat.



HERRINGBONE WEAVE

Woven of $\frac{3}{8}$ -in. reeds, this herringbone pattern makes an attractive and comfortable seat. Though the weave may appear complicated at first glance, it is nothing more than a repeating pattern weave of over three, under three. After the first six rows, the pattern repeats itself to the front of the seat. To ensure that the seat stays tight, the same pattern is repeated on the bottom of the seat.

The first and last weavers are fill-in strips. Instead of wrapping around the seat rails, 6 in. to 8 in. of extra length is simply tucked inside the seat—the tightness of the weave will hold the fill-in strips in place. Before weaving the last rows, add another fill-in strip between the front legs.



I've always loved the look of woven seats; they're inviting, comfortable and clearly handmade.

Because the seat is rectangular, the weaving for the settee is pretty straightforward. But weaving is slow work, so wear comfortable shoes and be ready to stand for a while. For this seat I used $\frac{3}{8}$ -in.-wide reeds (the material is actually the inner core of the climbing rattan vine), but oak or ash splints can be woven the same way. Reeds, and splints for that matter, are bought by the coil. I used about four coils of reeds to weave the seat for this settee. You should buy more reeds than necessary because, especially on a long seat like this, you'll want to use only the longest lengths so that you won't have to join the lengths of reed too often. You can buy reeds at many hobby and craft stores and through Connecticut Cane & Reed Co. (860-646-6586).

Before weaving, the reeds are first soaked in warm water (those who know suggest 140°F, but I've never put a thermometer to mine) for 45 minutes or so. After soaking, start with a long length of reed and orient it so that the correct side will be facing out on the weave. By bending the reed to a tight curve, you'll notice that short fibers fray loose on one side but not on the other. The side where the fibers break loose should go to the inside of the seat. Begin by using a #3 or so upholsterer's tack to secure the reed to the seat rail at the left rear side of the bench, then begin wrapping the warp (the reeds that run front to back). Start by going under the front rail and then over the back rail and continue in this fashion, keeping the weave tight.

When you reach the end of the length of reed, you'll have to join that piece to another. Make sure all joining is done on the bottom of the seat. There are numerous ways to join reeds, but the method I've used successfully is to notch the end of both lengths and tie them together with string or copper wire. The other method I use is simply to staple the two reeds together. Many weavers balk at this method, but when pressed they admit to using it almost every day. No matter how you join the reeds, once the seat is woven, they can't go anywhere. If you do use staples, you can even remove those left visible after the weaving is complete.



Ending the warp. When you reach the side rail, pull the reed underneath the seat and use a #3 upholsterer's tack to secure it to the seat rail.

Weaving begins underneath the seat at the rear left corner. Instead of tacking the reed in to place, simply fold under the first 6 in. or 8 in.

Weaving a herringbone pattern. As you continue weaving the pattern into the seat, the weave gets tighter. You'll need to guide the last few rows using a dull knife.

Continue weaving tightly across to the right end of the bench. When the warp is complete, work an upholsterer's hammer into the warp and tack the end of the reed to the seat rail, which should keep the warp tight. As you work, remember that reed shrinks slightly in length as it dries, so use a spray bottle of water to keep the seat damp.

Before you start the weft, or main weave, add a fill-in strip at the back of this bench on the top only. A fill-in strip runs between the two rear legs but is not attached to the bottom of the seat. Drop a length of reed into the warp, and fold it over, leaving about 6 in. inside the seat. Go under two, over three, as shown in the drawing on the facing page. Simply continue the pattern as you weave the strip into the warp. At the end, stuff about 6 in. of the strip inside the seat. The fully woven seat will be so tight that there will be no risk of the fill-in strip going anywhere.

The weavers (the lengths of reed that run left to right) create a three-over, three-under herringbone pattern. Start by tucking a weaver under the bottom left corner, weave it through the warp, going over three, under three all the way across, and then carry it over the side rail. The first weaver on the top of the seat (row 2 in the drawing on the facing page) goes under the first reed in the warp, then over the next three. Continue the three-over, three-under pattern all the way to the right seat rail, where the reed continues around the seat rail and under the seat.

Flip over the settee and weave the bottom in the same pattern: But begin by going over two, under three, over three, under three, until you reach the left seat rail. Wrap the weaver around the seat rail and continue with your second row across the top. But when you start the second weaver (row 3) across the top, begin by going under two and over three, then continue the three-over, three-



JOINING REEDS
When you reach the end of a length of reed, join another piece on the bottom side of the bench. Cut two notches on each piece, then line up the notches and bind them with a heavy thread. Another option is to staple the two pieces together.

under pattern to the end of the rail. The pattern continues this way throughout the seat.

When adding weavers along the bottom of the seat, it is no longer necessary to join them. Simply overlap the old weaver and the new weaver for about 6 in. and continue weaving. The tightness of the weave will keep the seat from coming loose. The more weavers you add, the tighter the weave gets. Everything should proceed smoothly until you reach the last third of the seat. At this point, it becomes increasingly difficult to fit the weavers through the warp. To help make the weaving easier on the last few rows, cut the leading end of the weaver into an arrow, and use a dull table knife to help open up the warp and guide the weaver through. I've also used locking pliers, hemostats and needle-nosed pliers to grasp the end of the weaver and work it through the warp.

Once you reach the front of the seat, you can add a fill-in strip, as you did at the back, or leave it as it is. All that's left is to pull staples, trim string and burn off any frayed strands of reed. Woven seats are typically treated with a few coats of linseed oil, cut two-thirds with thinner or turpentine, and recoated every year or so. For convenience, I used the same Minwax finish I used elsewhere on the settee.

The settee is as simple to make as the feeble drawing I first made, but I like its character—especially the lightness of the piece and the walnut accents. I think the verticality of the reeds across the wide seat rails works well with the vertical slats in the back. I've built a couple of these pieces now. But I still don't have a coffee table—so I guess it's back to the drawing board. □

Matthew Teague is an associate editor.

Horizontal Router Table

This easy-to-build table
cuts tenons fast and accurately

BY ERNIE CONOVER

Being a traditionalist, I favor using mortise-and-tenon joints in all frame construction. For years I have cut tenons on the tablesaw with a tenoning jig, and I still favor this method for large tenons. For $\frac{3}{4}$ -in. stock, I became convinced that it would be child's play to build a simple table that would effectively cut tenons in almost all situations. This table, designed and made with the help of my friend Dave Hout, can be built in about two hours, works better than commercial tables of a similar ilk and is small enough to be stored out of sight when not needed.

I made the table of medium-density fiberboard (MDF), but good-quality veneer-core plywood would work, too. Simple biscuit joints hold the table together. I used $\frac{3}{4}$ -in. material for the bottom and sides and a double thickness for the top. The same material can be used if you wish to construct a miter gauge. The swing arm was made of $\frac{1}{2}$ -in. veneer-core plywood, as were the front and back ends, and the adjusting screw block can be made from any hardwood. While it is tempting to cover the table with plastic laminate, a couple coats of white shellac will give plenty of wear resistance.

Any $1\frac{1}{2}$ -hp router that handles $\frac{1}{2}$ -in. bits will work in the table. The router does not have to be super-adjustable. Because the majority of tenons cut by my machine are $\frac{3}{4}$ in. long, the router-bit depth is seldom changed. The adjustment that controls tenon thickness is tweaked frequently, but it's done using the screw in the screw block, not the router itself. In short, when it comes to routers, an old clunker will do.

The table is easy to use. A



$\frac{1}{4}$ -in. tenon is correct for $\frac{3}{4}$ -in. stock, yielding approximately a $\frac{1}{4}$ -in. shoulder, depending on the stock thickness. In most situations the shoulder dimension can be carried all the way around the tenon. This works splendidly because four quick cuts yield a perfect tenon. With a narrow rail (1 in. or less), a smaller shoulder at the top and bottom is desirable. In this case, you can either move out the $\frac{1}{8}$ -in. spacer below the adjusting screw to reduce the shoulders by the same amount or place a $\frac{1}{8}$ -in.-thick shim under the rail while cutting. For a haunched tenon, a spacer block of the same thickness as the groove in the adjoining post is interposed between the stock and the swing arm before starting the cut where the haunch is desired.

A backer board to help avoid tearout is seldom necessary if you use the sequence of cuts shown in the photos on the facing page.

The first breakout is to the back side of the rail, and the remaining three breakouts are inconsequential. I use a $\frac{1}{2}$ -in. solid-carbide spiral-fluted (two flute upcut with $1\frac{1}{4}$ in. of flute) router bit. The upcut design pulls the stock against the swing arm, which is just where it should be. Resharpened bits are fine for use in this table because the exact diameter of the bit is inconsequential.

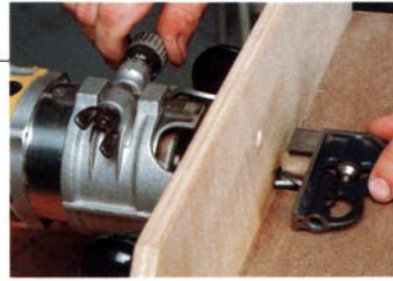
By plunging the bit through the swing arm after mounting the router, you get a zero-clearance opening that prevents small tenons from dropping into a void around the cutter. Most shavings end up under the table, but to ensure this you may have to widen this opening below the surface. By closing the open ends of the box with $\frac{1}{2}$ -in. plywood, a shop vacuum or dust collector can be connected to the table to minimize dust. Once finished, you will find the table so useful that it will not gather dust! □

Ernie Conover runs Conover Workshops in Parkman, Ohio.

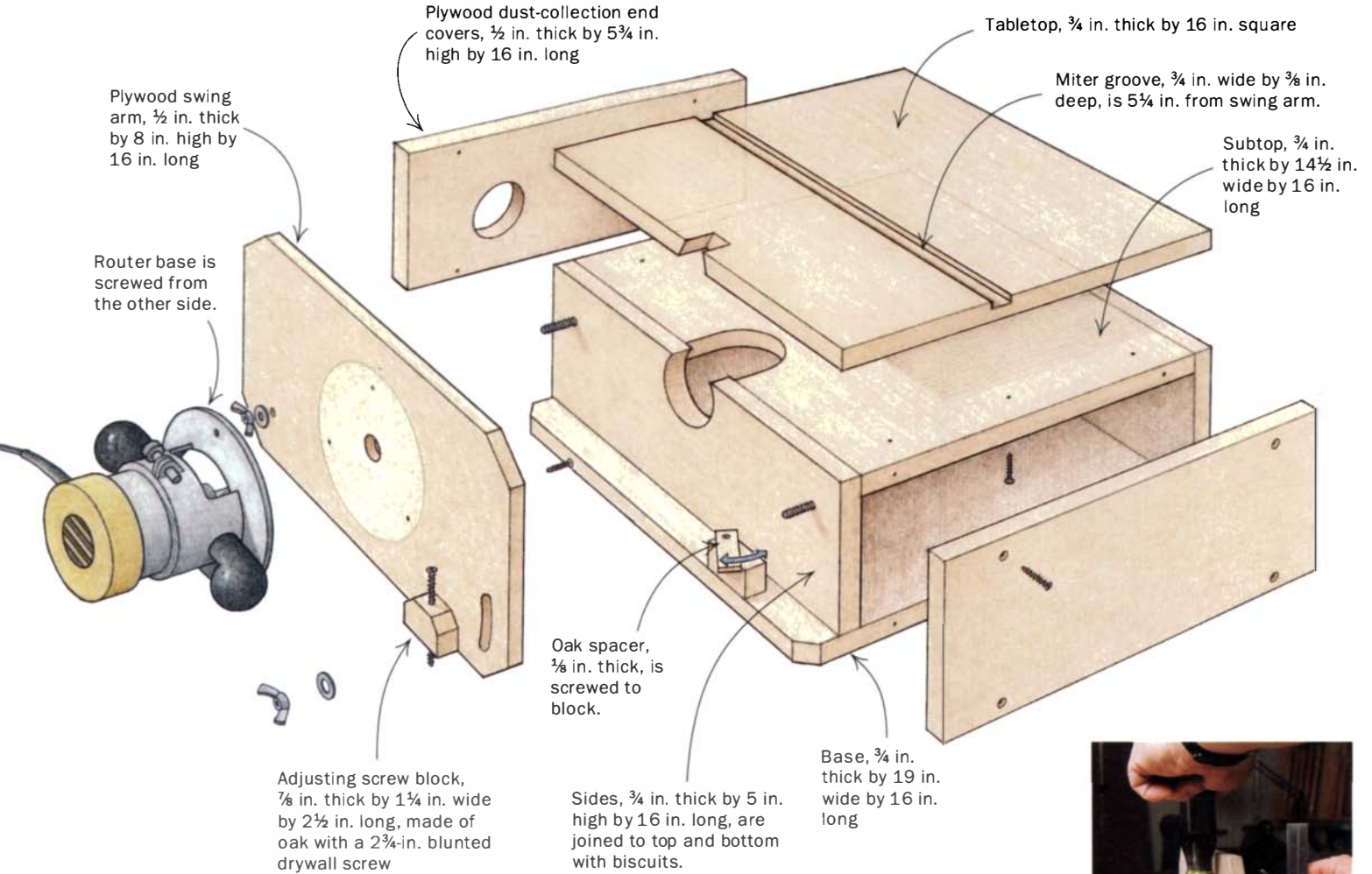
SIMPLE TO BUILD, EASY TO USE

This horizontal router table is made of $\frac{3}{4}$ -in.-thick MDF and $\frac{1}{2}$ -in.-thick plywood joined with biscuits. Almost any type of non-plunging router is suitable, and depth and height adjustments are easily made.

SAFETY NOTE: When working with most table-mounted routers, stock is fed from right to left. But because the router for this table is mounted horizontally, stock must be fed from left to right, as in the photo on the facing page.



Depth adjustment. The depth of the cut is controlled using the adjustment gauge on the router.

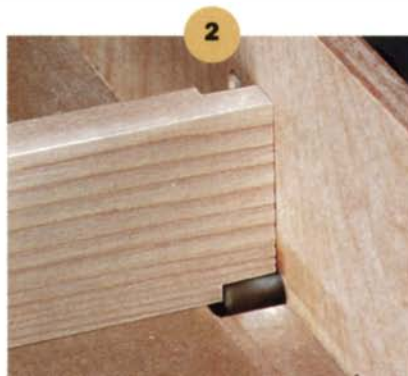


Height adjustment. Fine-tune the height of the router bit by turning the screw in the screw block. When correct, tighten the wing nuts on the swing arm.



ACCURATE RESULTS

By turning the wood in a clockwise motion away from you, the breakout is confined to the initial cut. Follow the sequence in the photos below to maintain consistent height and depth through all four cuts.



Glazing with Polyurethane



This nearly foolproof method offers durability and full control over the color and depth of finish

BY M. DAVID BECTON

I like the look of a glazed finish. It gives wood a color and depth that's hard to match. So I developed a simple glazing method using polyurethane varnish. By using polyurethane varnish, I am able to create a durable, hard finish that has excellent resistance to heat, moisture and solvents. And it can be wiped on with little fuss, a nice advantage for anyone without spray equipment. I use a mineral-spirits-based clear, satin, gel-polyurethane varnish. Bartley (800-787-2800) makes one called "gel varnish" that works well.

In addition to great depth, there are several other good reasons for choosing a glazed finish to color wood. It's a great way to dark-

en light-colored areas of sapwood in a board. Then, too, you can darken or lighten an entire project to suit your taste. Also, blotchy areas can be blended out. And finally, glazing allows you to tame any wild grain, and it's just about foolproof.

With this method there aren't a lot of hard-and-fast rules, so each step can be customized as needed to get the finish color and depth you want. Usually a sealer coat, typically thinned shellac, is applied to the bare wood. Then, depending upon the color you're looking for, a coat of stain may be added. The glazing coats follow: usually one to three of them, but there can be more. These colored coats are sometimes the same color, but the colors in each coat are

GLAZING FROM START TO FINISH



Adding layers of polyurethane glaze to a cherry porringer table, the author transformed the unfinished piece (left) into a table with deep, rich, warm colors (far right).



Sand. To achieve a smooth, glazed finish, hardwoods, like this cherry, should be sanded through 180 grit.



Apply shellac. To control blotching when the color coats are applied, a washcoat of thinned shellac is added first.



Add stain. The author wanted a yellow tint, so he added a coat of golden oak stain.

typically changed as needed to achieve the final color. As a last step, a clear topcoat is added to help protect the glaze.

Coloring the polyurethane

To add color to a gel-polyurethane finish, mix in Japan colors, universal tints or even artist's oil colors. Most oil-based paints also work. But to avoid drying problems, don't mix more than one part coloring agent to eight parts gel-polyurethane.

Another good option, and one I used for the porringer table shown here, is to mix in one of the gel-stain products made by Bartley. Bartley's gel products can be mixed in any proportion.

As you might expect, matching the glaze to your desired color is a matter of trial and error. It's best to work with small amounts while trying to nail down the color. Also, jot down notes on the proportions of gel and color that were used so that you'll be able to achieve the same color again.

One more point here. It would be prudent to do all of the finishing steps first on a test board. That way you'll be able to look at the test board and see whether the final result is what you want.

If you're unhappy with the look of a glaze coat as it is being applied (and before it dries), simply wet a paper towel or rag with mineral spirits and wipe off the entire coat. Then, with the slate clean, make adjustments in the color and try again. And the coat underneath won't be affected. Sometimes it can take several adjustments until you get the color you want.

Surface preparation is critical

If I've learned one thing in 20 years of finishing, it's that the quality of the sanding process on bare wood can make or break the quality of the final product. Heavy mill marks can be removed with 80-grit sandpaper. For lighter mill marks, use 100-grit paper followed by 120 grit. Depending on the hardness of the wood and how rich a finish you want, you might use an even finer grit, say 180 or higher.

Once the sanding has been completed, brush on a washcoat of shellac to all the surfaces. The shellac prevents the stain from splotching and streaking.

Dewaxed shellac works very well, but white or amber shellac may also be used. Keep in mind that each coat of shellac adds some color, usually a very light amber.

For hardwoods, like the cherry used in the porringer table, use one part 3-lb.-cut shellac and one part denatured alcohol to get a 1½-lb. cut. For softwoods, the mix should be thinner; one part 3-lb.-cut shellac and three parts alcohol. As you apply the shellac,

PREPARING THE SURFACE



The first step is to sand thoroughly. Don't rush the sanding process. A little extra time here pays dividends later.



Brush on shellac. A washcoat of thinned shellac added before the stain helps control blotching.



Apply the stain. To help achieve the result you want, the wood-coloring process starts with a coat of oil-based stain; golden oak was used for the porringer table.



First glaze coat. A polyurethane gel provides the first coat of glaze. The author used Bartley's golden oak gel stain.



Second glaze coat. For an aged and weathered look, a 50-50 mix of two polyurethane gels—walnut and clear—is applied.



The topcoat. A clear topcoat adds depth to the finish. Plus the topcoat provides some extra abrasion protection.



APPLYING THE GLAZE



A cloth pad helps control the application of the glaze coats. The pad is made from a couple of rectangular-shaped pieces of an old cotton T-shirt. Wrap one piece around a folded piece to create a soft pad that will fit comfortably in your hand.

The first coat of glaze. A brush is used to apply the first glaze coat, a gel stain. The cloth pad allows the author to remove just the right amount of glaze from the surface to get the desired result.



try to avoid overlapping the brush strokes. That way, you won't spread too much shellac in one area.

After the shellac washcoat dries, cut down any nibs—crystallized dust and raised grain that dry in the finish—with 220-grit sandpaper. Silicon-carbide paper, used dry, is my usual weapon here. By taking a little extra time to get a nice, even washcoat, the subsequent coats of finish will go on easier and more consistently.

Stain the surface, if needed

At this point, start the coloring process by applying a light to medium shade of stain. Because I wanted the porringer table to have a yellow tint, I used a single coat of Minwax golden oak stain. Had I been looking for a brown tint, I would have used Minwax provincial stain. But don't feel locked in by what I do. You can use any color of oil-based stain that gets you toward the final desired color. However, if a stain isn't going to help you achieve the color you want, simply skip this step.

Apply the stain with a brush, then wipe off the excess with a soft rag. When working on a flat surface, like a tabletop, flood the wood with stain. Then use the brush to work in the liquid before removing the excess with the rag. You can remove either a little or

a lot of the stain. For better control, it's best to apply the stain to one section at a time. Start with the least conspicuous area and then move to the most conspicuous.

One final point on stains—give them plenty of drying time, especially alkyd stains, which need 24 to 48 hours to dry completely. Rush this step, and you're simply begging for adherence problems with the polyurethane coats that will follow.

Apply the glaze coats

Once the shellac and stain coats have been completed, you're ready to start the glazing steps. The glaze is simply brushed on, then wiped off with a cloth pad. Using a pad to wipe off the glaze helps control the application better than a brush can.

The pad is made from a couple pieces of an old cotton T-shirt. One piece is cut into a rectangle, then a smaller piece is folded and placed inside the rectangle. When the rectangle is wrapped around the inner piece, the result is a nice, soft pad—much like a French polishing pad—that fits comfortably in your hand.

First coat—The first coat of glaze is the foundation for all of the remaining coats. Subsequent coats simply build on the first coat.

The secret to the glazing steps is to go slowly and work only one area at a time. Brush on the glaze kind of thick and then, depending on the desired look, either wipe off just about all of it or leave most of it on. And don't try to get to the final color in one coat. Several lightly colored coats look better than one dark coat.

For the cherry porringer table, I used a single coat of Bartley's golden oak gel stain, wiping off the stain lightly with the pad. But you can choose any color oil-based gel stain you want. Or you can add color to a clear gel.

Sanding—After this and all subsequent coats of glaze have fully dried, you need to do a little light sanding to smooth out the tiny nibs left in the dried finish. This sanding step also helps level out any uneven brush strokes.

Sanding between coats has an added benefit of leaving a better surface for the next coat to grab. Unlike lacquer, polyurethane does not melt into the coat below it, so the sanding scratches create a foothold for the new coat.

I find that 400- to 1,000-grit wet sandpaper dipped in soapy water does a nice job. But it's important to sand with a light touch. The first coat is thinner than paper, so it won't take much sanding to cut through it.

Be sure to remove all of the sanding dust completely before you add the next coat of glaze. If you don't, the new glaze coat will trap the dust particles on the surface. A good going-over with a vacuum will remove most of the dust. Then wipe it down with a tack rag to pick up the rest.

Second coat—Once the first coat has been sanded, it's time to apply color to the gel. But before starting, you'll need to make another cloth pad, because there's more brushing and wiping to do.

I wanted the porringer table to appear aged and weathered. The idea was to have the finish look almost dirty from many years of service. And to do that I needed a dark color, one that was almost black. So I added Bartley's walnut stain, mixing one part stain to one part Bartley's clear gel. This mixture tends to be thick, though, so I usually add thinner until the blend becomes about the consistency of cake batter.

If the wood surface has a fairly consistent color throughout, you can simply brush on the glaze and wipe it off as needed. Try to avoid putting it on so heavy that you end up with raised brush marks. It should flow smoothly and lie flat on the surface.

If the glaze is globbing up the surface with streaky color, you're probably putting on too much. Try applying a lighter coat. To make the rag glide just right, it's sometimes helpful to thin the glaze with mineral spirits or Penetrol. But keep in mind that thinning the polyurethane mixture is also going to dilute the binding qualities. That means it won't adhere as well to the previous coat. So don't add more than one part glaze to one part thinner.

If there are light and dark areas you'd like to even out, use the glaze to darken the light areas. Then decide how much glaze, if any, you need to add to the dark zones.

If you don't like the color you're seeing as it's applied, just wipe it off with a paper towel or rag, wetted with mineral spirits. Then adjust the color and try again.

Let each coat dry thoroughly. If you don't, and you need to wipe off the next coat, you are probably going to remove both coats instead of just one. In most areas of the country, a glaze coat will dry

ADJUSTING THE TONE



Mix the second coat. The author wanted a "dirty" color, like that found on many antiques, so he mixed walnut gel stain and clear gel-polyurethane finish. Japan colors, universal tints, artist's oils and oil-based paints are other good options for coloring polyurethane gels.



Brush on the second coat. A heavy coat of glaze is applied with a brush, then it's partially wiped off with the cloth pad. Less is wiped off in areas that need to be darkened.



You can't go wrong here. If the color of a glaze coat isn't what you wanted, simply wipe it off before it dries, remix the colors and try again.

ADDING THE CLEAR TOPCOAT



Mix the topcoat. Once all of the glaze coats have been added, a topcoat is prepared using clear gel-polyurethane that has been thinned with mineral spirits or Penetrol. The mixture should have the consistency of 30-weight motor oil.

Wipe on a topcoat. The topcoat brings out all of the color and depth in the layers of glaze.



overnight, but in Georgia, where it can get pretty humid, I generally wait a little longer.

Additional glaze coats—The long drying time between each of the coats has one advantage. It gives you plenty of time to study the evolving color and depth of the finish and decide whether the color of the next glaze coat needs to be darkened, lightened or perhaps changed entirely.

In most cases, you'll be able to get the color and depth you need with just the first coat of glaze, plus two or three additional coats. For the porringer table, I added two coats on top of the first coat.

A clear topcoat for depth

A clear topcoat will give the layers of colored finish some additional depth. Plus the topcoat offers a little more scratch protection.

For small projects, I like to use Deft's polyurethane finish. It comes in a spray can for easy application and has a thin consistency, so it doesn't look quite so thick after it has dried.

On projects that are too big to be easily finished with a spray can, I apply clear, gel-polyurethane thinned slightly with Penetrol. First I sand the surface thoroughly with 1,500-grit paper dipped in soapy water. Then I rub on the gel with a clean cloth pad.

I usually don't apply a topcoat to all of the surfaces of a project. Instead, it's

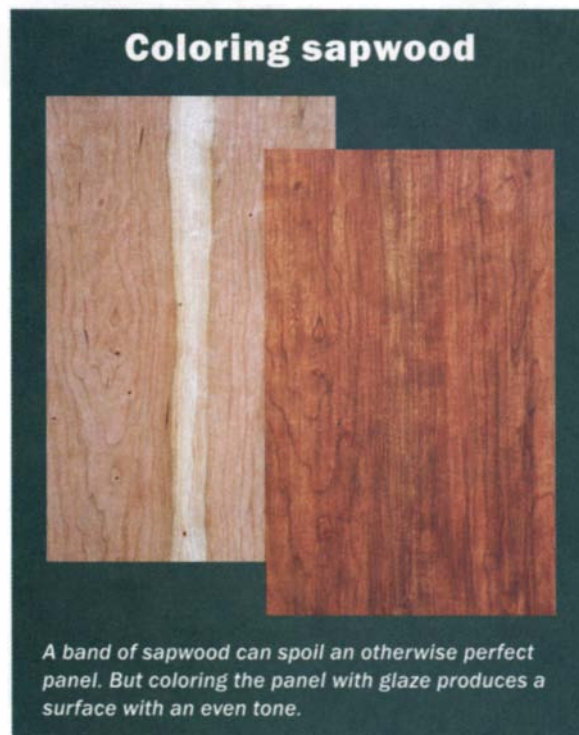
applied only to large, horizontal surfaces that tend to catch your eye quickly and stand out. So, on the porringer table, only the tabletop got the topcoat.

Buffing adds a rich luster

I could stop at this point and be more than satisfied with the results. But I prefer to include another step: buffing the finish. And like the topcoat, I use this step only on tabletops and similar horizontal surfaces. All that's needed here is some buffing paste. I like a product made by 3M called Finesse-It (ebony). If not available locally, you can order it by mail through Wood Finishing Supply (800-451-0678). This product is best used with an electric buffer and a wool polishing pad, but it can also be applied by hand with a cloth pad.

Work on a small section at a time. Start by applying a dab of the compound to the tabletop, then buff it out with the electric polisher or cloth pad. For the final step, use a soft rag to wipe off any of the compound remaining on the surface. It's a great way to polish the surface and to bring out all the color and depth of your glazed finish. □

M. David Becton has been building and finishing furniture for 20 years. He lives in Americus, Ga., where he operates a custom-furniture business (www.bectonltd.com).



A Breeding Ground for Furniture Makers

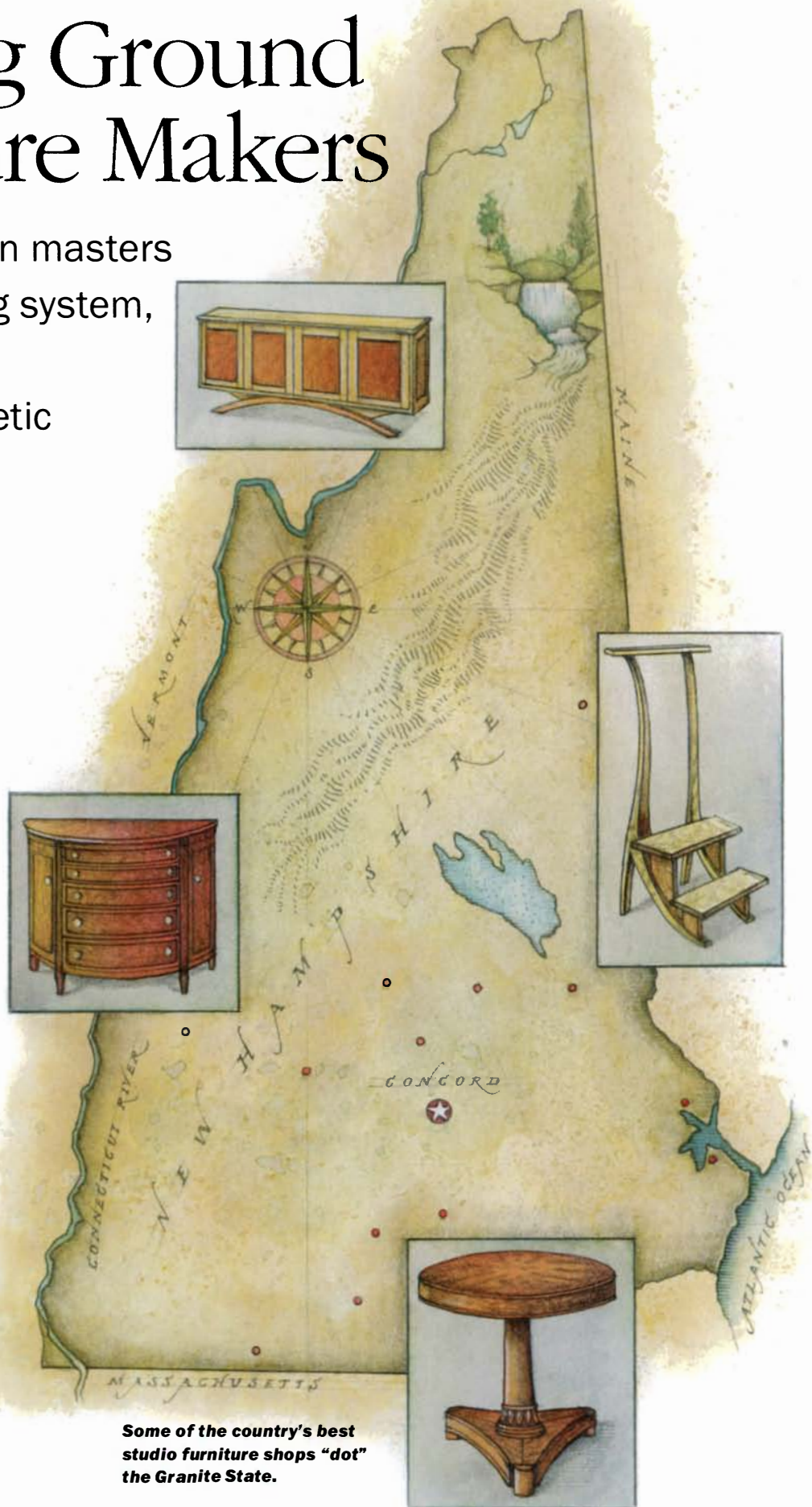
New Hampshire's modern masters have crafted a mentoring system, a marketing approach and a blossoming aesthetic that may land them in the history books

BY ASA CHRISTIANA

Three years ago, after a furniture-making apprenticeship in North Carolina, Thomas McLaughlin was ready to return to his native New England. The obvious location was Massachusetts, where he grew up and where his children's grandparents were waiting, but a chance meeting with a New Hampshire craftsman changed his plans.

During a summer vacation in the White Mountains, he ran across the shop of David Lamb, an established furniture maker in Canterbury, N.H. Over the next few summers the two became friends and began sharing portfolios. McLaughlin was astonished by the level of Lamb's work. He also was intrigued by the abundance of studio furniture makers in the state and the three-tiered guild system at work there, attracting people to custom woodworking, helping them turn professional and then supporting them afterward.

He heard about the Guild of New Hampshire Woodworkers, formed in 1993, which has an inclusive, educational mission and an extensive video library of members' techniques and projects. Then Lamb told him about the more exclusive League of New Hampshire Craftsmen, the nation's oldest state craft organization, which has a well-attended annual juried fair, permanent gallery and network of seven retail



Some of the country's best studio furniture shops "dot" the Granite State.



“We have a friendly competition, trying to outdo each other.” — *Loran Smith, New Durham*

Making a name for New Hampshire. The state’s top furniture makers banded together in 1994, forming the New Hampshire Furniture Masters Association to market their work to buyers beyond the region. Gathered in Canterbury, N.H., at the group’s recent annual meeting are, from left along the curved back row, Thomas McLaughlin, Howard Hatch, Ted Blachly, Terry Moore, Garrett Hack, Jon Brooks, Jon Siegel, Jere Osgood, Jeffrey Cooper and Jo Stone; and in the right foreground, from left, are Loran Smith, Wayne Marcoux, Bill Thomas, Omar Clairmont and David Lamb.

shops. What piqued McLaughlin’s interest most, though, was a brand-new, third organization, launched by the state’s master furniture makers, Lamb among them.

The new group was called the New Hampshire Furniture Masters Association and was the brainchild of local stockbroker Anthony Hartigan (see Notes & Comment, *FWW* #138, p. 24). Hartigan devised an innovative method for marketing studio furniture outside the small state. In a nutshell, the group finds local patrons to commission pieces that are put up for auction at an annual, well-publicized event. If and when a piece sells at auction (each has a minimum selling price), the artist simply makes a duplicate for the patron. If the piece doesn’t sell, the patron gets the original.

The keys to success for the new venture were educating affluent local citizens

about the tradition of fine furniture making in the state and the concept of patronage, and publicizing the auction to potential buyers in Connecticut, New York and beyond. The first exhibit and auction was held in 1996, and the new approach was an instant success.

Last September the group held its fifth annual exhibit and auction at the posh Mount Washington Hotel and Resort. The event offered the work of 30 furniture makers and, as a new twist, welcomed seven guest artists from outside New Hampshire, including Silas Kopf, Kristina Madsen and Hank Gilpin.

Lamb assured McLaughlin that he had the right stuff for the Masters Association, and McLaughlin was convinced he could “hit the ground running” in New Hampshire. In the end, his relocation decision was

easy. He set up shop in Canterbury in 1997, making 18th-century reproductions. “It has worked out well,” he said.

McLaughlin regularly has pieces in the Masters Association auction and the League’s annual fair. He is an active member of both groups and of the Guild and teaches furniture-making classes at Canterbury Shaker Village.

A three-tiered system

The creation of the New Hampshire Furniture Masters Association completed the state’s furniture-making hierarchy, said Terry Moore, a founding member of the Masters Association and the Guild. Woodworkers typically start in the Guild, work to get juried into the League and then work toward the Masters Association, he explained. The Masters group represents the highest level of craftsmanship, supporting the state’s top furniture makers and giving up-and-coming woodworkers something to strive for.

Moore pointed to the recent career of Loran Smith as “the common progression.” Smith had been making high-end kitchens when he began to attend Guild meetings. This is the usual first step, Moore said, because the Guild is basically educational, and members can just sit back and absorb. The Guild has annual shows, but they are not formally juried.

The Masters members began to notice Smith’s furniture at the Guild shows. “It was obvious that this guy had what it takes,” Moore recalled. After three or four years, Smith exhibited a serpentine chest of

The Guild of New Hampshire Woodworkers has an inclusive, educational mission. Some of the group’s 300 members attended a recent seminar at the workshop of David Lamb, in Canterbury. Inside, Loran Smith, the group’s current chairman, gave a demonstration on molding techniques. Like many in the Furniture Masters group, Smith and Lamb remain active in the Guild, helping others reach their potential.



drawers with inlay, and Masters members said, "This guy is ready." Smith was juried into the League shows and invited into the Masters Association.

Smith's furniture-making career hit a high point recently when he sold a Federal sideboard to U.S. Sen. Judd Gregg and was invited by Gregg's wife for a VIP tour of the White House.

The League and the Masters Association are similar in that each has a juried show and demands more than one piece from a woodworker, but the Masters' jury process is tougher, and its deadlines, from proposal to delivery, are tighter. "The Masters separates the men from the boys," Moore said. Members are expected to propose at least two new pieces each Feb. 1 and deliver the finished work by June 1 for the catalog photo session. They must also know how to price their work. The deadlines push members to grow each year and to generate new designs. "They force us to think about what we are doing and how we do it," Moore said.

Both the League and the Masters Association help aspiring furniture makers realize their goal of getting out of commercial jobs and into studio work. "I'm a product of the system," Moore said. "I was building kitchen cabinets when I stumbled onto Living with Crafts." Living with Crafts is a 20-year-old exhibit that presents furniture in a series of room vignettes at the League of New Hampshire Craftsmen's Fair, which is held each year at the Mount Sunapee Resort in Newbury.

The New Hampshire definition of fine furniture

At the heart of the League and the Masters groups are their three-person juries. Currently, Moore and Jere Osgood serve on both juries, exerting a unified force on studio furniture making in the state. The juries are strict but supportive. Applicants who fall short on their first try are deferred, not failed, and are given specific pointers for future success. According to Moore, deferred woodworkers often are invited to bring pieces to a jury member's shop for informal mentoring.

Pieces are graded on a one-to-five scale for originality or for execution of a traditional design, for artistic decisions such as clarity of intent and integration of elements, for command of the medium, for attention to details and for functionality. In

THE HOTHOUSE EFFECT: NEW HAMPSHIRE'S CROSS-POLLINATION

The founding members of the New Hampshire Furniture Masters Association created an environment in which the states' best could inspire each other to new heights. Members' influence on each other is evident in this year's auction catalog. The hot-house effect is strong but subtle, always stopping short of imitation and allowing a wide range of design voices to coexist.



Contrasting edge detail marks the group's work. Subtle varieties of this motif have spread from the work of founding members Terry Moore (demilune commode in fiddleback mahogany with ebony detail) to newer members like Wayne Marcoux (sofa-hall table in cherry with bloodwood detail). Two tables by David Lamb, another founding member, employ contrasting edge beading. His center table has crotch and mottled mahogany veneers and raised beading in cocobolo; his demilune table is made of mahogany with stone top, feet and apron detail.





“I’m inspired to push my usual work to a higher level. It’s not easy when you’re alone in your shop to go that extra mile.”—Thomas McLaughlin, Canterbury

Willing to learn. After Gerald Fitzgerald’s work was accepted into the League of New Hampshire Craftsmen’s Fair, the jury had one further suggestion for him: to play down the use of contrasting wood in his Arts and Crafts-inspired tables.



hibit on his second try. His first attempt was a set of contemporary Arts and Crafts-style tables with half of the components made of bird’s-eye maple and the other half of black walnut. The jury deferred him based on the overall execution of the pieces. They pointed to metal fasteners used to attach the tabletops, corners left too sharp, light machine marks detected when they held each surface in a raking light and the quality of the topcoat, Fitzgerald recalled. For his next attempt, he attached the tabletops with wood buttons, put a 1/16-in. roundover on all edges as the jury suggested, did more scraping and sanding of each surface and switched from a brushed-on to a wiping varnish. Fitzgerald’s work was juried in, but Moore added a final piece of advice, saying that the use of contrasting wood was too extreme. Although Fitzgerald thought that was “a matter of opinion,” he limited the use of contrast in the new tables he crafted for the show, making them of cherry with walnut used only for wedges in the through-tenons.

concrete terms, the juries expect pieces to be completely finished, including backs, bottoms and insides. There can be no glue drips, tearout or rough surfaces left anywhere. Joinery must be mechanically sound and tightly fitted.

“Then, pay as much attention to the finish as you did to the joinery,” Moore tells potential exhibitors. They must prepare surfaces well; apply the finish carefully with no runs, drips or overspray; and “finish the finish” with wet sanding, steel wool or other fine abrasives. A coat of wax is usually recommended.

Pieces must be refined beyond the level of a project plan in a woodworking magazine. Sometimes a prospective member is a good craftsman but hasn’t found his or her design voice yet. On the other hand, a straight reproduction of a Shaker table might score low on originality but could still make the grade because it is well done and “fulfills its intent” as a reproduction. “We try to judge pieces for what they are,” Moore said.

Reacting to constructive criticism—Gerald Fitzgerald of Middleton, N.H., made it into the League’s Living with Crafts ex-

Fitzgerald puts great value on the access he gets to the state’s best makers. For example, Osgood recently took time to look over some boxes Fitzgerald built and then encouraged him to make his own hardware from brass and leather.

The jury sees two reactions to criticism and deferment. Some, like Fitzgerald, re-

main “humble and teachable,” Moore said. Others just get angry and defensive, saying basically, “I’ve been selling them this way for years.”

Moore’s reply to the disgruntled applicant is, “That’s fine. Maybe you don’t need our help. But if you want to sell them through us, you’ll have to make some adjustments.”

He told me about one woodworker active in Guild who entered a Queen Anne chair for consideration by the League. The cabriole legs were well done, but they were not highly polished, and there were gaps in the joinery where the legs met the crest rail. Overall, there simply was not enough attention paid to detail.

The jury pointed out these things, suggesting that the man clean up the shoulders of his tenons. The furniture maker chose to ignore the advice and brought back the same chair when he reapplied, protesting, “This is the way a country craftsman would have built the chair 100 years ago.”

The jury countered by sticking business cards in all of the joints and failing the chair again. The League’s “Guidelines for Wood,” sent to prospective exhibitors, calls for all pieces, including reproductions, to “be the best quality by *today’s* standards.”

“There can be no laziness evident or inattention to detail,” Moore said. “Why relax

The right stuff. Loran Smith first caught the attention of the New Hampshire Furniture Masters Association with a serpentine-front chest of drawers in the Federal style. Now an Association member, Smith recently sold this Federal sideboard—of mahogany, with crotch veneer, makore banding and maple stringing—to U.S. Sen. Judd Gregg of New Hampshire.



your standard after putting 40 to 50 hours of work into a chair?"

Inspired by each other

Even the most established Masters Association members benefit from the yearly pressure to develop new pieces and the interaction with other members. If not for these factors, Moore said he would not have attempted or completed his harlequin desk, which involved veneering a harlequin pattern of diamonds over bulging panels (the piece is featured on the back cover of this issue). "We have a friendly competition, trying to outdo each other," Smith said.

"Every exhibit inspires me to take more risks, to break away," McLaughlin said. "I'm also inspired to push my usual work to a higher level. It's not easy when you're alone in your shop to go that extra mile." Being around craftsmen like Moore, Lamb and Osgood, McLaughlin has learned "the disposition of 'no compromise' that you have to maintain to do great work."

A "New Hampshire school" emerges—

Moore believes that the influence the Masters Association members have on each other is creating a New Hampshire aesthetic that will someday be recognized in history books. "It's the hothouse effect," he said, describing the fertile environment that allows design motifs to move through the group. The cross-pollination is evident in this year's Masters auction catalog. For example, Moore and Lamb tend to use a contrasting edge detail, such as that on their demilune commode and center table, respectively. But they have noticed subtle variations spreading through the group. "In 100 years people will say, 'That's typical New Hampshire detailing,'" Moore said.

If the group's work is beginning to gel into a distinct school of design, the reasons are manifold. Aside from influence on the group of the dominant jurors and mentors, there is the simple fact that so many members work or have worked together. Masters Association member Ted Blachly, for example, worked with Moore in 1992 and has assisted Osgood since 1993.

The Osgood effect—Osgood's influence is strong on the group, from his meticulous approach to his well-known design elements. The latter also can be seen in this year's catalog. Subtly reminiscent of Os-



The influence of Jere Osgood is pervasive.

Osgood exhibited these curly maple library steps this year, but his characteristic tapered bent laminations showed up in the legs of Wayne Marcoux's sideboard, made of curly maple with contrasting bloodwood detail around the edges of dyed panels. Marcoux's piece was on the cover of this year's auction catalog. Also, Ted Blachly's cheval-glass mirror, in rosewood with brass detail, has a leg-meets-leg element, at the frame's pivot point, that reflects a favorite Osgood motif.



good's work are the tapered bent laminations in the legs of Wayne Marcoux's sideboard, the leg-meets-leg motif at the top of the stand on Blachly's cheval-glass mirror and the saber-shaped legs on Moore's harlequin desk. Moore said he is "flattered" that Osgood remains so involved in the League and the Masters groups. "He's one of the best we have today in the world, and financially, he doesn't need to be here."

McLaughlin said Masters Association members share a desire to "preserve and protect this art form, fine woodworking."

To that end, the group's next goal is to open a furniture-making school, according to current chairman Howard Hatch. The project is in its conceptual stage, and the group is scouting locations for the facility. Hatch said the school will cater to all levels, not just to professionals.

The state's furniture makers are not only bullish on their future, but they also are taking steps to guarantee it. "In the upcoming decade," Moore said, "New Hampshire is the place to be for furniture makers." □

Asa Christiana is an associate editor.

Shopmade Tension Gauge

Built-in bandsaw gauges are notoriously inaccurate. Here's an inexpensive tool that eliminates guesswork

BY JOHN WHITE

A bandsaw blade that's not properly tensioned is going to cause problems no matter how well the rest of the saw is tuned up. And if you're doing an especially tough job, like resawing a wide board or ripping thick hardwood stock, the problems are going to be even worse. In many shops, however, the only way to measure blade tension is to use the gauge built into the back of the bandsaw. Yet these gauges are notoriously inaccurate. That usually results in a blade that is undertensioned.

A blade under too little tension leads to all sorts of grief. It can bow backwards and sideways, causing the blade to cut slowly. It easily wanders from a cut line. And when resawing, the cut often takes on an unwelcomed barrel shape.

But too much tension on a blade creates its own set of headaches. It can overstress the wheels and bearings of the bandsaw, and sometimes the frame, too.

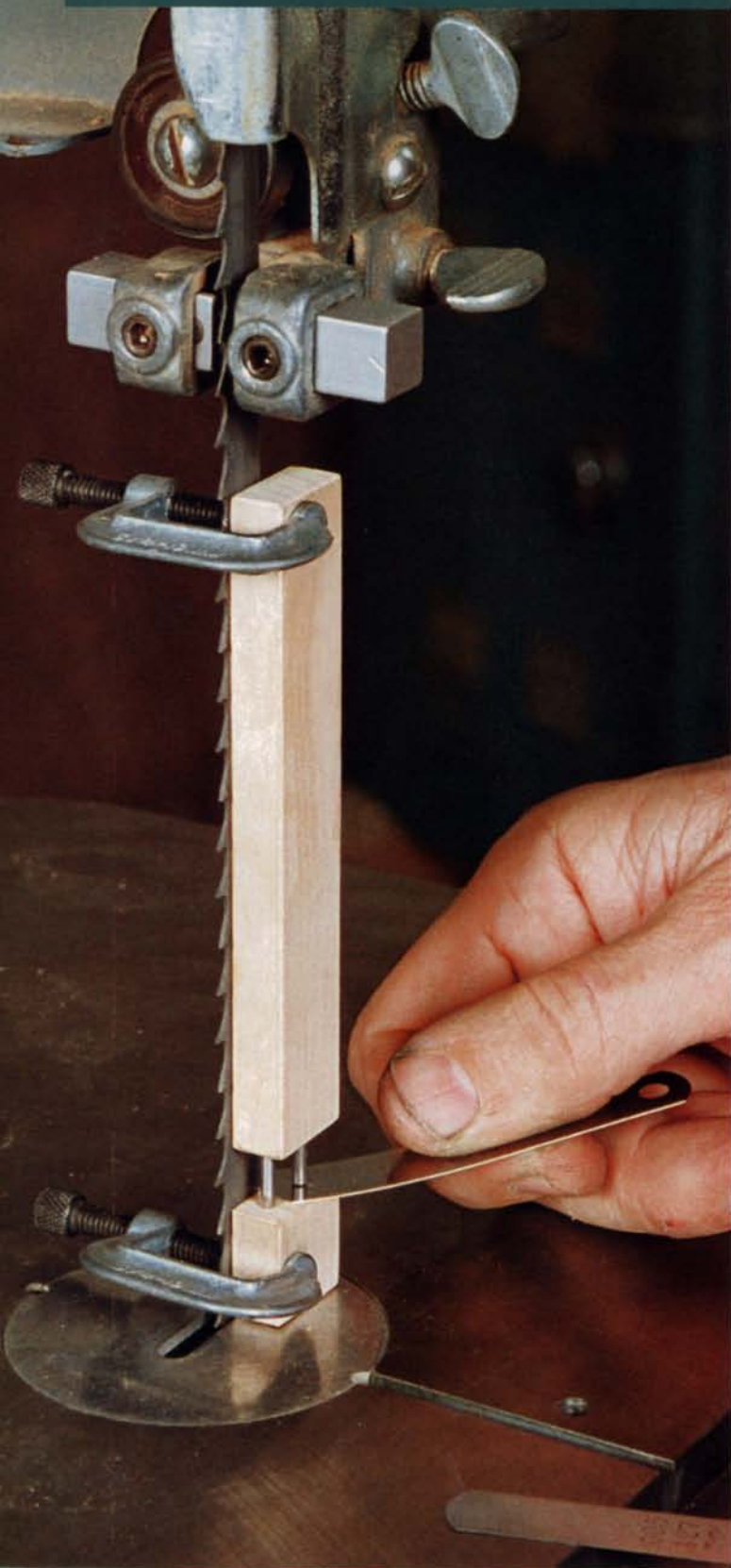
That's where this unassuming little tool comes in handy. Used with an ordinary automotive feeler gauge, it allows you to set the correct tension on your steel blade quickly. And it works with any bandsaw or blade.

Making the gauge

There's nothing fussy about making the tool. A fine-grain hardwood is best here because you want the ends to have hard, flat surfaces. Maple, birch and beech are all good choices.

Start by cutting the hardwood to a $\frac{3}{8}$ -in.-thick by $\frac{3}{4}$ -in.-wide by $5\frac{3}{8}$ -in.-long strip. Then, in one end of this strip, drill a $\frac{3}{2}$ -in.-dia. hole for the alignment pin, making the hole 2 in. deep. A T-shaped fixture I made came in handy here, allowing me to clamp the strip so that it is perpendicular to the table.

Next, using a fine-toothed crosscut blade on the tablesaw, carefully cut a $\frac{3}{4}$ -in.-long block from the drilled end of the strip. Before cutting this short block, make index marks on both sides of the cut



line. These marks enable you to line up the two pieces in their original orientation when the gauge is assembled. Polish the cut face of the short block by running it across very fine sandpaper laid on a flat surface. Do not round the face. For accuracy, it must be absolutely flat.

Next, drill a 1/2-in.-deep, 3/32-in.-dia. hole for the measuring pin in the end of the long block, next to the hole for the alignment pin. Make the measuring pin by cutting a 6d finish nail 7/8 in. long. It's a good idea to round the working end of the pin slightly, shaping it with a file and then polishing it with a fine stone or emery paper. Then tap the pin into its hole, making sure you don't accidentally use the alignment-pin hole.

Now cut the alignment pin. Once again use a 6d finish nail, but this time cut it 1 3/8 in. long. This pin should fit tightly in the short block but slide in the hole in the long block. The simplest way to achieve this is to place the pin in a drill chuck with about 3/4 in. exposed and then slightly reduce the pin diameter with a fine file as it spins. The mild steel in the nail will cut quickly, so check your fit frequently and stop as soon as you have a sliding fit. The gauge will be more accurate if there is no excess play. Smooth the ends of the pin and tap its larger-diameter end into the short block, making sure the index marks are facing each other.

That's all there is to making the gauge. But before it can be used, you need to know just how much tension to apply to the blade. And as I learned, the answer to that question depends on the kind of bandsawing you're doing.

How much tension?

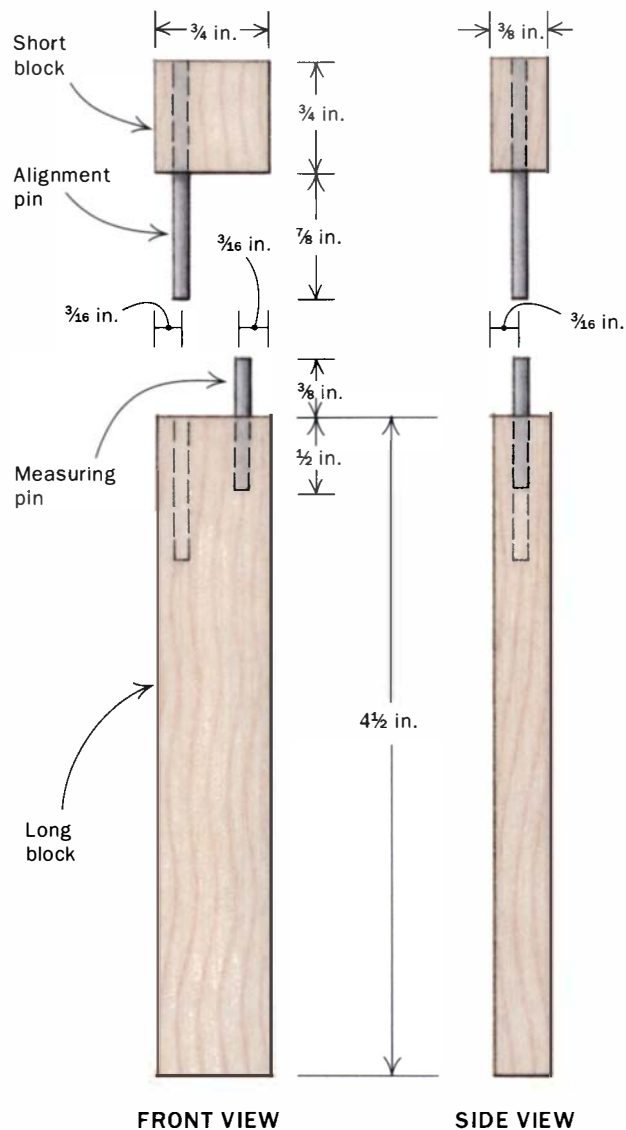
For tough jobs like resawing or cutting thick stock, blade makers suggest a maximum blade tension of 15,000 lbs. per square inch (psi) when using a consumer-grade bandsaw (such as the 14-in. Delta or its cousins). Use the same tension regardless of whether the blade is carbon steel, bimetal or carbide-tipped.

Keep in mind that you don't have to use such high tensions for all work. On a consumer-grade saw, you'll extend the life of the blade, tires and bearings if you lower the tension to about 8,000 psi when cutting thin stock and softwoods.

Any tension beyond 15,000 psi could cause problems with the structure of a consumer-grade saw. But for some of the heavy-

BANDSAW TENSION GAUGE

Not much bigger than a pen, this tension gauge can be made for pennies with a small piece of hardwood and two finish nails.



Drill the alignment-pin hole. Cut a hardwood strip to size, then drill a hole in the end for the alignment pin. A T-shaped fixture keeps the strip square to the table.



Mark and cut. After adding a pair of index marks, the tablesaw is used to cut off the short-block portion of the tool.

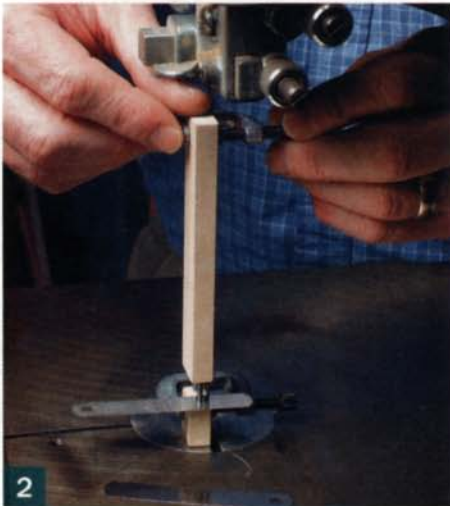


File down the alignment pin. If the alignment pin (a 6d nail) is to slip smoothly into a mating hole, it must be filed down a bit as it spins in the drill press.

USING THE GAUGE



Relax the blade tension. Then clamp the short block of the gauge to the side of the blade, just behind the teeth.



Leave room for the feeler gauge. Clamp the long block to the blade so that a 0.005-in. feeler gauge fits between the block and the measuring pin.

Add tension to the blade. Once a 0.008-in. feeler gauge slips between the short block and the measuring pin, back off a bit.



duty, industrial-quality bandsaws, the blade can be tensioned up to 30,000 psi if it's going to be used for resawing.

It's interesting how "psi" translates into the number of pounds of tension applied to the blade and the wheel. A ½-in.-wide by 0.025-in.-thick blade requires a pull of about 188 lbs. to achieve a tension of 15,000 psi. And because both the cutting and returning halves of the blade are under tension, the bandsaw's tensioning spring must push up the top wheel with twice this force, a total of 375 lbs.

The suggested tension, measured in psi, remains the same no matter what size blade you're using. So, for example, because the

¾-in.-wide blade has a smaller cross-sectional area than the ½-in.-wide blade, you need only about 140 lbs. of pull (280 lbs. on the top wheel) to produce 15,000 psi of tension.

But knowing how much to tension the blade is only half the story. You also have to be able to tell how much tension is actually being applied, which is where this gauge comes in.

The gauge is easy to use

The best way to determine blade tension is to measure the amount the blade stretches as it's pulled taut. As you might expect, steel

doesn't stretch easily. In fact, a 5-in. length of blade stretches only 0.001 in. (that's one thousandth of an inch) for every 6,000 psi of tension that's applied.

Based on this principle, several companies make a tension meter with a dial indicator that reads the amount of blade stretch. However, at \$130 to \$320, these instruments don't come cheap.

That's the beauty of the gauge I designed. It measures stretch, just as the expensive version does, but you won't have to stretch your budget to get one. To check the accuracy of my gauge, I set it up in tandem with a top-of-the-line tension meter. The measurements on my gauge were within 10% to 15% of the readings on the tension meter.

And using the gauge is as simple as making it. First install a blade on your bandsaw, then tension it lightly and adjust the tracking and guides while moving the blade by hand. When the blade is running properly, power up the saw and let it run for a minute or two to warm up the blade and tires, then cut the power and unplug the saw.

Next, back off the tension until there is just enough pull on the blade to prevent it from going slack and slipping off the tires. Usually this is going to be a little below the tension mark for a 1/8-in.-wide blade on the machine's built-in scale.

Raise the upper blade guide out of the way and lightly clamp the gauge to the side of the blade just behind the teeth (see photo 1 on the facing page). The measuring pin should be toward the back of the blade. Loosen the upper clamp and pinch a 0.005-in. feeler gauge between the measuring pin and the long block (see photo 2 on the facing page). Leave the tool in place, and tighten both clamps.

Now recheck the gap with the feeler gauge. It may change slightly from the torque of the clamps, but it isn't important that it be exactly 0.005 in. A starting gap of 0.004 in. or 0.006 in. will work just as well.

To tension the blade, begin by choosing a feeler gauge that equals the width of the starting gap, plus an additional 0.001 in. for each 6,000 psi of tension you want to apply to the blade. For example, if your starting gap is 0.005 in. and you want 15,000 psi of tension, start with a 0.008-in. feeler gauge (see photo 3 on the facing page). This is going to give you 18,000 psi of tension, but don't worry; it's going to be adjusted lower almost immediately.

With the 0.008-in. feeler gauge in hand, increase the blade tension while using the gauge to check the gap under the pin. When you reach 18,000 lbs., the feeler gauge is going to fit just under the pin. Once there, you can back off a little on the saw's tension adjustment to end up in the range of 15,000 psi.

Now you can mark your saw's tensioning scale at the pointer, noting the width of the blade. The recalibrated scale will allow you to tension the same-width blade quickly in the future without using the gauge every time. To guard against the spring becoming weaker, it's a good idea to use the tension gauge and feeler gauges to recheck the scale occasionally.

With a little practice, this little bandsaw tool will allow you to set the blade tension in less than five minutes. And with tension set just right, you can look forward to getting better performance from your bandsaw. □

When he's not writing about woodworking, John White helps keep the Fine Woodworking shop in tip-top shape.

A spring with spunk

If you tighten the tension gauge on any small, consumer-grade bandsaw, such as the 14-in. Delta, there's a good chance you won't come close to reaching the 15,000 psi of tension that's recommended for resawing on these lighter-weight machines. With a 1/2-in.-wide blade, you're likely to find that running the saw's Indicator off the end of the tensioning scale, beyond the 3/4-in.-wide blade setting, increases the gap by only 0.001 in. (6,000 psi) or perhaps not at all.

If you continue to crank down on the tensioning knob, the gap (and the tension) is going to finally and suddenly increase but only because you've crushed the coils of the spring until they're touching. However, running the saw with the spring collapsed will damage the saw. That's because the spring also serves an important secondary function as a shock absorber.



A better spring.
The spring on a consumer-grade bandsaw (top) won't be able to apply as much tension as the aftermarket spring made by Iturra (bottom).

If your saw can't reach 15,000 psi of tension, it's because the springs on these smaller machines go soft quickly, and a fatigued spring exerts far less force than it was originally designed to apply, no matter how far it is compressed.

The answer is to buy a new spring. Iturra Design in Jacksonville, Fla. (888-722-7078), makes one from a better grade of steel, and there's more of it, so it lasts longer. Plus it is stiffer, so you can add more tension. For \$14.95 the Iturra spring is a good investment.

By the way, you can extend the useful life of any spring (and blade) if you remove most of the tension when the saw isn't being used. This is especially important with the Iturra spring. Just be sure to remember to re-tension the blade before turning on the saw.

Current Work

Current Work provides design inspiration by showcasing the work of our readers. Send photos and entry forms to Current Work, *Fine Woodworking*, 63 S. Main St., Newtown, CT 06470. For more details and an entry form, visit our web site: www.finewoodworking.com.



Eric Espinosa

Espinosa designed this coffee table (28 in. deep by 48 in. long by 17½ in. tall) so that it would be strong enough for two small children to stand or play on, without sacrificing its appearance. Built using primarily a single 48-in.-wide slab of bubinga and accented with ebony, the table can be shipped in parts and easily assembled. Photo by Katherine Bird



Jacob Marks

A relative newcomer to furniture making, Marks' two dining chairs are his first. He said building them posed a formidable engineering challenge and that the process "spurred my maturation as a furniture maker on levels I could never have anticipated." The chairs (16 in. deep by 17 in. wide by 57 in. tall) are made of rift-sawn white oak.



Courtland P. Smith Jr.

Inspired by a photograph of a tazza in John H. Evans' book *Ornamental Turning* (Astragal Press, 1993), Smith made this cherry pedestal bowl (11 in. dia. by 13¾ in. tall) using a conventional lathe and a Legacy ornamental mill.



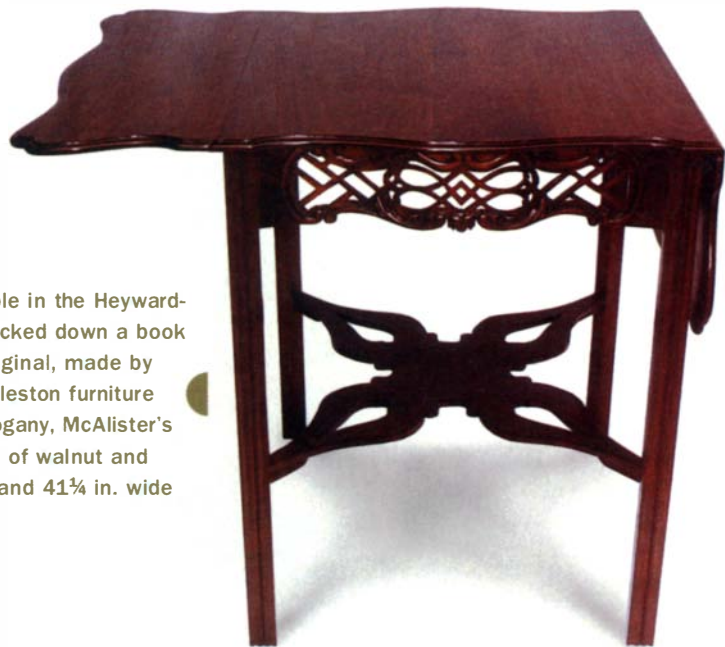
Barton M. Bauers Sr.

Made of Brazilian mahogany with cedar as a secondary wood, this nightstand and chest (11 in. deep by 20½ in. wide by 30½ in. tall) is an original design. A woodworker for more than 60 years, Bauers once took jobs on commission, but now he builds only what challenges him, and then he usually gives the piece away. This piece was a gift for his wife.



John W. McAlister Jr.

McAlister saw the original version of this table in the Heyward-Washington House in Charleston, S.C. He tracked down a book that contained measured drawings of the original, made by Thomas Elfe, a prominent 18th-century Charleston furniture maker. Though the original is made of mahogany, McAlister's version (24½ in. deep by 28 in. tall) is made of walnut and measures 23 in. wide with the leaves down and 41¼ in. wide with the leaves up.



David B. Conley

This Hepplewhite sideboard is a reproduction (slightly altered) of a piece that appears in Albert Sack's *The New Fine Points of Furniture, Early American* (Crown, 1993). Conley built this sideboard (26½ in. deep by 72 in. wide by 40 in. tall) using Pennsylvania cherry, with inlays of maple, ebony and East Indian rosewood. The finish is a hand-rubbed mix of linseed oil and mineral spirits.

Lewis A. Prescott

Both Prescott, an amateur woodworker who lives in Rhode Island, and his son, who lives in California, were quite taken by a desk they saw advertised in an antiques magazine. Just over two months later, and unbeknownst to his son, Prescott had completed the desk as a gift (26 in. wide by 33 in. long by 29 in. high) and shipped it across the country. The desk is made of mahogany and finished with lacquer.



Kurt Andersen

Made of maple and bird's-eye maple, this corner table was built for a friend's meditation room. Andersen, who lives and works in San Francisco, designed this piece to be unobtrusive and delicate. Finished with water-based polyurethane, the table, 19 in. deep by 28 in. wide by 32 in. tall, is now used to hold candles, incense and flowers.



Alan Charney

Charney said his goal was to build a working spinning wheel rather than one that simply looks like a spinning wheel. Referred to as a "walking" spinning wheel, the 44-in.-dia. wheel walks back and forth as you spin the wool on the needle. Made entirely of walnut, the wheel's construction involved steam-bending, riving, hand-chiseling screw threads and turning parts for the spinning-wheel subassembly.



James M. Keiffer

A year ago, Keiffer bought Jim Tolpin's *The Toolbox Book* (The Taunton Press, 1995) and began designing one of his own. Keiffer's version (17 in. deep by 30½ in. wide by 22 in. tall) is made of maple with mahogany drawer fronts and pine interiors. Loaded up with tools, it weighs more than 300 lbs.



Thomas W. Dumke

This tall Shaker chest, otherwise known as Dr. White's Chest, was made using the drawings in Thos. Moser's *How to Build Shaker Furniture* (Sterling, 1980). The chest (19 in. deep by 43 in. wide by 72 in. tall) is made of cherry with poplar as a secondary wood. The finish is hand-rubbed tung oil.



James Madorma

A mechanical engineer by trade, Madorma's woodworking skills are self-taught. His version of a Philadelphia highboy (21½ in. deep by 42 in. wide by 79 in. tall) is made of cherry and was designed to challenge his skills. Aniline dye and gel stain even the wood's tones and give it an aged appearance, as do the antiqued brass pulls.



Rory Sadler

Sadler got the idea for this table—his second project as a student at North Bennet Street School—after studying a marble mosaic floor at the Getty Museum. The table (36 in. dia. by 29 in. tall) is made of walnut, walnut burl and quartered veneer, holly stringing, and a tulipwood/holly/ebony banding. Photo by Lance Patterson



Tips for photographing your furniture

1. Use 35mm color print (negative) film of moderate speed (ISO 200-400).
2. Clean and dust the furniture.
3. No matter how you light the furniture, it will appear more three-dimensional if each plane has a different brightness. Take care, however, to avoid excessively bright highlights or dark shadows.
4. To be sure the photos will be free of distortion, avoid the use of wide-angle lenses, and photograph with the camera positioned even with the center of the furniture both vertically and horizontally.
5. Photograph the furniture from several angles. Include some head-on shots, as well as some shots that show both the front and side of a piece.
6. Keep the background simple. A cluttered or otherwise distracting background may draw the viewer's attention away from the subject.

Fine Woodworking

Index to issues 140 through 146

This alphabetical index covers all the issues of *Fine Woodworking* published during 2000 (FWW #140 through #146). Starting in 1988, *Fine Woodworking* has published annual indexes in the January/February issues, starting with FWW #74. The Taunton Press also sells a cumulative index covering issues #1 through #120 for \$12.95. The format of each index reference is issue number:page numbers. A hyphen between page numbers means the discussion is continuous; commas between page numbers indicate an intermittent discussion. This index, like all previous indexes to *Fine Woodworking*, was prepared by Harriet Hodges, chair maker.

- A**
- Abrasives:**
diamond paste, 140:59
extra-fine, source for, 140:36
wax for, 140:47
- Acrylic, substitute for, cheap, 141:22
- Alder (*Alnus* spp.), knotty, for cabinetry, 142:82
- Altschuler, Stuart M.:
on gilding, 141:110-14
on waxes, 140:46-51
- Angles, right, angle plates for, 140:24
- Aprons, furniture, beaded, 142:79, 85
- Arcs:**
drawing, tool for, 145:42
templates for, 143:36
- Arno, Jon:
on basswood, 141:64-66
on certified lumber, 146:65, 67
on sweet gum, 142:56-59
- Arts and Crafts style:
cabinet in, small wall, 140:52-55
finish for, 141:126
furniture in, 146:63
- Ash (*Fraxinus* spp.), color of, and light, 142:45
- B**
- Baldcypress (*Taxodium distichum*), for exterior use, 143:80
- Bandmills, advantages of, 143:98
- Bandsaws:**
blades for, 140:87-91
heat-resistant, 141:102
lead of, 143:46, 146:32
universal, 142:10
center-finder jig for, 140:18
circle-cutting jig for, 140:22
cutoff box for, 146:28
dovetails on, angle block for, 141:22
dust-collection for, 141:84
green-wood planks with, 143:98, 102
guides for, bearing vs. block, 141:102, 142:8
laminates on, resawing, 145:59
milling on, carriage for, 146:34
resawing on,
fences for, 143:46
jig for, 143:102
tune-up for, 143:45-46
tables for, auxiliary, 146:30-32
taper jig for, 146:36
tenons with, 142:62-63
venerer with, 143:44-49, 144:66-67
See also Fences. Miter gauges.
- Basswood (*Tilia* spp.), qualities of, 141:64-66
- Beaders, power, 142:85
- Beading:
for doors, 142:75, 76
for drawer, 142:54, 55, 143:100
- Beads:
curved, for aprons, 142:79, 85
with skew chisel, 145:84-87
- Becksvort, Christian:
on dovetails, 146:106
on drawers, 141:56-57
on drawer slides, 143:74-77
on plank doors, 145:78-83
- Beds:
Art Nouveau openwork, 141:90
- four-poster,
building, 140:76-82
lacewood-mahogany, 146:85
headboards for, frame-and-panel, 140:76, 80-81
lights in, atop posts, 140:82
Murphy, web site on, 141:26
posts for, "inlaid" chamfered, 140:76-79
rails for, 140:79-80
testers for, 140:81-82
- Benches:**
laminated, 146:119
Lutyens garden, 143:78-85
- Benchstones:**
diamond, discussed, 141:12
oil,
diamond paste with, 140:59-60
flattening, 140:39
method for, 140:58-60
sandpaper-glass, 140:60-61
water,
flattening, 140:58
method for, 140:57
paint thinner for, 144:22
revolving, 140:56
- Binzen, Jonathan, profiles Paul Roman, 146:46-51
- Birch (*Betula* spp.), color of, and light, 142:45
- Bird, Lonnie:
on bandsaw blades, 140:86-91
on cabriole legs, 144:44-49
- Bits:**
router,
bearings for, 143:89
dovetail, 143:89
for plunge cuts, 141:12
stop collars for, 143:89
straight vs. spiral, 140:62-65
up-cut vs. down-cut, 140:64
sharpener for, reviewed, 142:32
spade, improving, 145:18
stops for, tape, 146:32
- Blackburn, Graham, on design, 146:56-63
- Blackwood acacia (*Acacia melanoxylon*), working, 140:77
- Bleaches, for color-fastness, 142:45
- Boardman, Allan, profiles Sam Maloof, 146:52-55
- Boggs, Brian, on Maloof chairs, 146:55
- Bolts, flush, 142:77
- Bookcases, low, with pipestone inlay, 142:92
- Bowls:**
ebony, 146:91
olive translucent, 146:93
"Radish Salad," 143:26, 146:116
sgraffito, 146:94
spalted maple, 146:91
on stand, 146:92
on stilts, 146:93
waney-edged, 143:93
- Boxes:**
clamps for, 141:49
glue masking for, 141:48
hinges for, barbed, 140:83-85
jewelry,
maple-bubinga-wenge, 145:94
tansu-inspired, 142:92
mitered,
gluing up, 141:49
no-measure method for, 143:16
nailed Bible, 146:57
- pencil, 143:90
- Box joints. *See* Finger joints.
- Brass, antiquing, 144:70
- Breadboard ends, for trestle tables, 141:77, 80-81
- Breed, Allan:
on coffin planes, 142:106-10
on Newport secretaries, 144:84-88, 130
- Bridle joints, mitred, 140:54-55
- Brown, Steve, on compound-angle tenons, 143:108-12
- Buchanan, Curtis, on seat carving, 144:114-20
- Bureaus:**
after Chippendale, 144:95
carved, freehand intaglio, 146:118
cherry, 143:93
cherry-bocote, with inlaid clock, 143:91
cherry-maple-purpleheart, 141:90
cupboard-, 146:62
oak, ammonia-fumed, 143:92
See also Commodes.
- Burkin, Anatole:
on dust collectors, 141:82-87
on earmuff-radios, 142:46-48
- Burls, causes of, 141:104-6
- Business, managing, 146:136-42
- Butcher-block construction, warping with, 142:100-2
- Butterfly keys, in Arts and Crafts style desk, 146:63
- Buxton, Jamie, on dovetail templates, 143:86-89
- C**
- Cabinets:**
display,
cherry-pine-oak, 146:101
Krenovian, 143:92
entertainment-center, "post-modern," 142:90
file, disguised, 141:89
fir, watercolored, 146:116
jarrah-pear-tortoiseshell-bone, 145:95
mahogany, on stand, 146:81
with marquetry-inlay doors, 144:96
music, 146:103
parqueted, boldly, 143:49
with projecting nail, 146:10, 12, 51, 114
Renaissance revival, 146:61
17th-century, valuables, 143:124
small wall, 140:52-55
spice, 145:95, 146:118
on stand,
with marquetry princess, 142:91
teak-maple-wenge, 146:102
standing, 141:90
stereo, cherry, 145:94
three-tiered oak-lacewood, 146:85
for tools, 141:51, 52, 55
veneered, stamped-carved, 143:49
wall-hung, 146:38, 108-13
wenge-tulipwood-ebony, 144:94
- CAD, Squiggle program for, reviewed, 140:40
- Calipers:**
digital, using, 144:62-63
for lathe duplicates, 142:68-71
Calisto, Thomas J., on round table, 145:56-63
- Candlesticks, Osolnik, 146:92
- Carts, for lumber, collapsible, 145:93
- Carving:
of bandsawn veneer, 143:49
- basswood for, 141:64-66
bench for, swivel-tilt, 140:34
bicycle, 144:96
of cabriole legs, 144:48-49
of ducks in pond, 144:94
freehand intaglio, 146:118
learning, 144:86, 146:68-70
of moldings, 143:53-56
of Newport shell, 144:87-88
of shoes and gloves, 145:96
1670, 146:57
- Cast iron, maintenance of, 145:108
- Catches, types of, 142:76-77
- Caulk, guns for, as clamps, 145:20
- Center finders, making, 140:18, 146:30
- Chairs:**
after Greene-and-Greene, 146:119
arm, volutes on, 146:58
Arts and Crafts style, 144:95
web-site plans for, 141:26
back splats for, cyma-curved, 145:110-12
Brewster, 146:57
Chippendale, 143:61, 62, 91, 146:58
Conoid, 146:114
desk, 146:120
swivel, 142:91
dining, walnut-pear, 146:102
Eastlake, 146:61
Federal, 143:60
joinery for, compound-angle, 143:60-65, 108-12, 145:10
klismos-type, 146:60
Krenov-inspired, 146:101
laminated plywood, 145:28
leather arm, asymmetrical, 146:84
legs of, evening, 143:14-16
lyre-back side, 146:60
Mission style, 146:63
Morris reproduction, 146:121
Queen Anne, book on, 145:112
rocking,
Appalachian slatback, 146:115
Maloolf, 146:53, 55
Scandinavian side, 146:83
Shaker ladderback side, 146:62
splats of, 146:58-60
steam-bent, 146:116
Wegner classic, 146:118
Windsor, 146:121
business of, 146:136-42
comb-back, 141:88
Moser, 146:117
seat carving for, 144:114-18
wood choices for, 145:100-2
- Chamfers, for bedposts, 140:76-79
- Cherry (*Prunus* spp.):
aging finish for, 140:130
sun-bleached, 142:44
- Chests:**
blanket, coopered, 142:90
oak 1660, 146:57
red cedar, 143:92
- Chippendale:
bureaus after, 144:95
style of, 146:58
- Chisels:**
bevel, tested, 140:10, 12
handles for, 140:132, 141:10, 142:18
honing, on diamond plates, 141:12
prsharpened, 141:10
sharpening, Frid's way, 146:82
See also Skews. Steel.

knives of,
 nicked, 146:28-30
 replacing, 142:42-43
 tables of, adjusting, 142:40-42
 testing, 142:41, 43
 tuning up, 142:38-43

Joining:
 with circular saw, 143:72-73
 for edge-gluing, 141:46
 with planes, 142:98
 on shooting board, 144:100-2
 on tablesaw, 146:36-38

K
 Kelsey, John, and Rick Mastelli, eds., *Furniture Studio*, reviewed, 143:24-26
 Kirby, Ian:
Complete Dovetail, The, reviewed, 141:28-30 (erratum, 142:10)
 on dovetails, 146:106
 Knots, tight, using, 142:82
 Kolle, Jefferson, on sharpening, 140:56-61
 Krenov, James:
Furniture by... Students, reviewed, 144:28
 influence of, 146:98-103

L
 Lacewood (*Cardwellia sublimis*), qualities of, 140:102
 Lacquer, over fillers, 144:52
 Lamination:
 glues for, 141:46
 for "inlay" look, 140:76-79
 of round aprons, 145:58
 Lamp stands, making, 142:49-55
 Landis, Scott, on certified lumber, 146:64, 66
 Lathes, steady rests for, 143:14
 Latta, Steve, on cabinet doors, 142:72-77
 Layout, on wood stock, 140:67-68
 Leather, working with, 140:98-100, 145:120-24
 LeCoff, Albert, symposiums of, 146:93-94
Legs:
 cabriole, 144:45-49, 146:58-59
 laminated, gluing up, 141:44
 leveling, 142:20, 143:14-16
 for Lutyens bench, 143:81
 shaggy, 146:60
 steam-bent, 144:97
 tapered, 142:53
 fluted, 146:60
 mortising, 145:60-61
 with turned feet, 146:62
 tripod, 146:59

LeRoy, Tom, on hand-arm protection, 145:74-77
Lighting:
 in bedposts, 140:82
 blocking, 142:45
 for color matching, 142:121
 and finishes, 142:44-45
Linen presses:
 mahogany-oak-ebony-satinwood, 145:97
 sweetgum 18th-century, 142:58
 Lively, John, on tools, 146:96-97
 Locust, black (*Robinia pseudoacacia*), properties of, 146:78
 Lowe, Philip C., restores Symonds cabinet, 143:124
Lubricants, choosing, 142:36, 145:108
Lumber:
 bowed, planing, 145:90-91
 carts for, 145:93
 cutting station for, 141:53, 55
 from discarded furniture, 143:98
 mills for, miniature, 146:34
 selecting, 140:66-71
 from split logs, 143:96-98
 storage for, 140:71, 141:53, 55
 twisted, planing, 145:90-91
 tying down, 144:72-73
 web site on, 140:26
 wide, advantages of, 140:69-70
 See also Stock preparation.

M
Machinery:
 antistatic treatment for, 140:22
 evolution of, 146:71-77
 rust on, preventing, 145:108
 waxing, 146:30
 workshop design for, 141:54
 See also Lubricants. Roller stands.
Mahogany (*Suaeda* spp.):
 aging finish for, 140:130
 color of, and light, 142:44
 Cuban (*S. mahagoni*), source for, 141:26
 Mallets, making, 146:24
 Maloof, Sam, profiled, 146:52-55
 Maple (*Acer* spp.), color of, and light, 142:45
 Marckworth, John, on drawer slides, 144:74-77
 Marking gauges, Arricawood-bronze, 144:42

Marquetry:
 with bandsawn veneer, 143:49
 examples of, 142:91, 143:49, 144:96, 145:95, 146:114
 Matousek, John F., on horizontal mortiser, 141:67-69
 McDonough, Dick, on dust-proofing saw, 145:64-67
 McMurtrey, J.K., on dial calipers, 144:62-63
 Mehler, Kelly, on sliding tables, 144:78-83
 Metal, marker for, 140:60, 61
 Miller, Jeff, *Beds*, reviewed, 141:32
 Miller Falls, spokeshave No. 1, reproduction of, 140:38
 Minick, Chris:

on color matching, 142:121-22
 on shading finishes, 144:129-30
 on shopmade stains, 140:129-30,
 on simple finishes, 141:125-26
 on varnish, 143:121-22
 Mission style, chairs in, 146:63
 Miter boxes, for small stock, 142:55
Miter gauges, Incra, reviewed, 141:36, 36 (erratum, 142:10)
 Miter-gauge slots, cutoff box for, 146:28
Miters:
 with circular saw, 143:73
 gluing up, 141:47
 no-measure method for, 143:16
 shooting boards for, 144:100-2, 145:20
 sliding jig for, reviewed, 142:34
 splined, 144:68, 71
 hidden, 142:100
 standing, 144:102
 stop, for cock bead, 142:55
 Mock-ups, building quickly, 141:70-73
Moldings:
 carving, 143:52-56
 with combination plane, 140:106-10
 cove, on tablesaw, 146:28
 crown,
 corner-turning, 142:80-81
 curved, 142:79
 installing, 143:20-22
 curved, router jig for, 144:18
 with overarm-router, 142:80
 sanding blocks for, 142:20

Morris, William. See Arts and Crafts style.
Mortise and tenon:
 compound-angle, 143:60-65
 making, 142:50-53
 through, Arts-and-Crafts style, 146:63
 wedged, 146:109-11
Mortise gauges, using, 142:50
Mortisers:
 hollow-chisel,
 evolution of, 146:75
 problems with, 146:150-52
 horizontal, making, 141:67-69
Mortises:
 through-, 141:75, 78
 compound-angle, 143:61, 62-63
 on drill press, 140:73
 by hand, 142:51-53
 for locks, foil-locating, 140:24
 machine for, making, 141:67-69
 with router, 144:22, 146:34
 for tapered legs, 145:60-61
 uneven, causes of, 142:102

Motors:
 capacitors of, repairing, 141:100
 pulley speed with, formula for, 144:108-10
 voltage with, 146:148-50
Music stands:
 bent-laminated, 145:97
 cherry, 146:103
 tripod, 146:84

N
 Nailers, brad, pneumatic, 141:36
 Neptune, Will, on compound-angle joinery, 143:60-65

O
 Oak (*Quercus* spp.):
 color of, and light, 142:45
 finish for, 140:130
 O'Malley, Tony, on garden bench, 143:78-85
 Ottomans, Arts and Crafts style, 144:95

P
 Padauk (*Pterocarpus* spp.), color of, and light, 142:44-45
Paint:
 for abrasion resistance, 145:108-10
 pigmented coatings instead of, 145:108-10
 Panels, raised, spacers for, 141:49
 Parquetry, with bandsawn veneer, 143:49
 Particleboard, veneer-melamine, 144:42
Patterns:
 with router, bits for, 140:65
 for table parts, 141:75

for turning profiles, 142:68, 69
 Phenolic, substitute for, cheap, 141:22
 Photographs:
 cabinet for, 141:91
 scaling from, 144:65
Pianos:
 book on, 142:124
 pear and maple, 142:124
 soundboards for, 143:8
Pigments, natural earth, 140:51
Pine (*Pinus* spp.):
 aging finish for, 140:130
 color of, and light, 142:45
 red (*P. resinosa*), for furniture, 144:110
Planes:
 dial calipers for, 142:20
 dust-collection for, 141:84
 Ridgid TPI 300 benchtop, reviewed, 142:32
 Sears, reviewed, 144:36
 snipe with, eliminating, 145:22
 veneer through, 143:48-49
Planes:
 back-dragging, okayed, 145:114
 bench, new, 145:40
 block, using, 144:58-60
 block low-angle, reviewed, 143:34
 chisel, reviewed, 140:38
 coffin-style, new, 141:38
 combination,
 using, 140:8
 No. 55, 140:106-10
 for concave curves, 141:104
 with difficult wood, 144:54-61
 irons for,
 Japanese retrofit, 143:36
 replacement, 144:56
 sharpening, 144:55
 vibration-damping, 140:20
 jack,
 for flattening, 142:98
 as scrub, 143:12
 using, 144:56
 Japanese,
 tuning, 145:68-73
 using, 145:73
 jointer, using, 142:98, 144:56
 makers of, 144:61
 quality, 145:10
 ridges from, minimizing, 146:146-48
 scrub, using, 142:96, 98, 144:55, 145:10-12
 for shooting boards, 144:100-2
 shoulder, reviewed, 140:38
 smooth, using, 144:56, 61
 smooth coffin, restoring, 142:106-10
 tuning, 144:55
 wedges of, restoring, 142:108-10
 wooden,
 restoring, 142:106-10
 using, 142:110

Plans:
 value of, 145:12
 web sites for, 141:26
Plywood:
 carrier for, 143:22
 with circular saw, 143:70-73
 of colored veneers, 144:38
 lift for, 145:18
 N-type, 145:28
 tearout prevention for, 145:18-20
 thin, edging for, 144:67
 tying down, 144:72-73
 Pollaro, Frank, *Getting Started with Veneers*, reviewed, 145:26
 Posts, fluting, 142:79, 85
 Potassium dichromate:
 for aged finish, 140:130
 finish over, 140:130, 143:12
 toxicity of, 143:12
Pulls:
 bronze, 140:55
 Hepplewhite, 146:60
 jig for, self-centering, 146:30
 spalted-maple ebony, 146:111-12
 Purpleheart (*Peltogyne* spp.), color of, and light, 142:44-45
 Push sticks, gallery of, 145:28

R
Rabbets:
 stopped, 143:77
 on tablesaw, 143:76-77
Racks, for finishing small objects, 142:16
Radial-arm saws:
 cutoff box for, 146:28
 dust-collection for, 141:84
 tenons with, 142:62-63
 See also Fences.
Raffan, Richard:
 on skew chisel, 145:84-87
 on wood turning, 146:90-95
 Rags, oily, danger of, 143:12
 Rasps, for lathe work, 142:70, 143:10
Reeding:
 Federal, 146:60

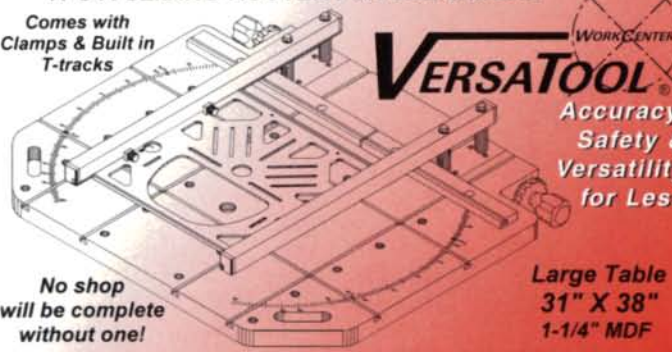
with router, and chisel, 141:8
 Relative humidity, monitoring, importance of, 141:96-98
 Rodel, Kevin, on leather, 145:120-24
 Rodriguez, Mario:
 on planing, 144:54-61
 on Stanley 55, 140:106-10
 Rogowski, Gary:
 on drill press, 140:72-75
 on mortise and tenon, 142:60-67
 Roller stands, triple, reviewed, 141:40
 Rooney, Andy, on tools, 146:86-89
 Rope, tying down with, 144:72-73
Routers:
 bases of, truing, 142:102
 circle-cutting jigs for, 144:40
 curved-drawer jig for, 140:132
 dado jig for, 146:24-26
 dovetails with, templates for, 143:86-89
 evolution of, 146:76
 mortising jig for, 146:34
 overarm, moldings with, 142:80
 pin arm for, reviewed, 144:36
 plunge,
 redesign of, 145:40
 for router tables, 144:10-12
 pocket-hole jig for, 143:16-18
 for router tables, by brand, 142:86-89
 as shapers, undercarriage jig for, 144:18
 tenons with, 142:65-67
 trim,
 beading jig for, 142:85
 fluting jig for, 142:85
 See also Fences. Mortisers: horizontal.
 Templates.
Router tables:
 baseplate inserts for, disadvised, 142:89
 height-adjustment for, reviewed, 143:34
 inserts for, cheap, 141:20-22
 levers for, 142:89
 mortiser-table combo, 141:67-69
 pin-router arm for, 144:36
 plunge routers with, 142:87, 143:12, 144:10-12
 round-stock dovetail jig for, 144:20
 routers for, by brand, 142:86-89
 -shapers, reviewed, 143:38
 tenons with, 142:65-66
 tops for, making, 142:89
 Rulers, safety, reviewed, 143:38
 Rust, preventing, 145:108

S
Sanders:
 for contoured work, handheld, 144:36-38
 detail, Bosch, 145:38
 disc, dust-collection for, 141:84
 drum,
 dust-collection for, 141:84
 reviewed, 145:46-51
 sanding-depth setting, 145:48
 strip changes for, 145:50
 duplicates on, 141:20
 rest pads for, 141:20
 Sears, reviewed, 144:36-38
 spindle,
 benchtop, 145:40
 dust-collection for, 141:84
 handheld, 145:40
Sanding:
 of difficult woods, 144:61
 station for, building, 141:55
 tables for, downdraft, 145:40
Sanding blocks, reverse-profile, making, 142:20
Sandpaper:
 folding, 146:26
 kinds of, 146:162
 strips of, life-extending, 146:34-36
Sawblades:
 cleaning, 146:26
 height of, measuring gauge for, 141:38
Saws:
 bow,
 praised, 142:96, 98
 ripping with, 142:98
 dovetail, 146:105
 hand, chest for, 142:24
 Japanese cheap, reviewed, 142:34
 Schleining, Lon:
 on gluing up, 141:44-50
 on Jefferson lap desk, 144:64-71
Scrapers:
 for concave curves, 141:104
 with difficult wood, 144:60
Screens:
 carving, 141:73
 mock-up for, 141:70-73
Screws:
 countersinking for, 145:112-14
 extractor for, 144:20-22, 145:42
 machine, for thin stock, 144:70
 pocket holes for, 143:16-18
 Scribers, center-, making, 146:30
 Scroll saws, rasp blade for, 145:22

- Sculpture:**
lathe, 146:94, 95
salad bowls, 146:116
- Sealers:**
over fillers, 144:52
under fillers, 144:51-52
for finish adhesion, 145:54-55
glue-sizing, 145:54
kinds of, 145:52-54
oil as, 141:60
for oily woods, 143:102, 145:54
sanding, 145:52-53
shellac, 145:53-54
vinyl, 145:53
zinc stearate in, 145:52-53
- Seats, woven tape, 146:62**
- Secretaries:**
block-front, 141:91
Empire-style, 146:60
as entertainment centers, 146:120
reproduced, in multiple, 144:84-88, 130
reproduction, 146:120
sassafras, 141:88
sweet gum, 142:58
wood for, selecting, 140:68-60
- Shaker:**
chairs, 146:62
entertainment center, 146:120
round stand, 146:117
side table, 146:62
- Sharpening:**
methods of, 140:56-61
with sandpaper, 143:10
test for, 140:60
See also Benchstones. Honing.
- Shellac:**
dewaxed, explained, 146:152
over fillers, 144:52
under fillers, 144:51
kit for, reviewed, 141:42
old, and veneer problems, 140:98
over potassium dichromate, 140:130
as sealer, 143:102
- Shelves:**
dadoes for, 140:53
supports for, biscuit, 145:22
- Sheraton style, discussed, 146:60**
- Shooting boards:**
jointing on, 144:100
miter, 144:100-2, 145:20
- Sideboards:**
after Art Deco, 146:115
after Greene and Greene, 146:117
with arched underpinning, 146:83
bubinga-ebony, 145:96
cherry, rosewood pulls, 143:93
elegant small, veneered, 146:117
gonçalo alves, with marquetry, 145:95
Hipplewhite, 141:88
with pipestone inlay, 142:92
- Silky oak (*Grevillea robusta*), qualities of, 140:102**
- Skews, basics of, 145:84-87**
- Skipper, Roger A., on stock preparation, 145:88-93**
- Slots, with drill press, 140:84**
- Soap, degreaser, source for, 140:51**
- Society of American Period Furniture Makers, meeting of, 140:30**
- Solvents:**
for varnish, 143:58
for wax, 140:48
- Spline joints, with tablesaw, 144:68, 71**
- Spokeshaves:**
history of, 145:8-10
round, reproduction, 140:38
wooden, reviewed, 143:40
- Spray equipment:**
Asturo, reviewed, 145:40
conventional vs. HVLP, 146:162
high-volume low-pressure (HVLP), reviewed, 140:12
- Squareness, ensuring, 142:52, 53**
- Stains:**
color of, changing, 142:122
light-fastness of, 142:44, 45
from plants, 140:129-30
sapwood, 141:102-4
sealers with, 145:55
teas, 143:18
from vinegar and iron, 140:130 (errata, 142:8-10)
from walnuts, 140:129
- Stands, Shaker round, making, 146:117**
- Steel, discussed, 141:8-12**
- Stevens, Craig Vandall, on mock-ups, 141:70-73**
- Stickley, Gustav, style of, 146:63**
- Stock preparation:**
before cutting, 140:71
with handtools, 142:96-98
with planes, 144:54-61, 145:10-12
for precision work, 142:73
system for, 145:88-93
See also Surface preparation.
- Stools:**
bar, cherry-maple, 145:94
early organic, 146:115
Stop blocks, for drill presses, 140:73
Straightedges:
making, 142:41, 43
safety, reviewed, 143:38
Surface preparation:
of concave curves, 141:104
for finishes, 141:125
Sweetgum (*Liquidambar styraciflua*), qualities of, 142:56-59
Swenson, Carl, on Japanese planes, 145:68-73
Switches:
dust-collection detector, 143:66-69
foot, 146:26-28
safety, reviewed, 144:36
safety improvements to, and warranties, 143:8
Symposia, on case furniture (Williamsburg Vir., 2000), 142:26
- T**
- Tables:**
aprons for,
round, laminated, 145:58-63
scallop, 146:59
bedside, maple-beech-aluminum, 144:30
cocktail, 146:103
coffee, Arts-and-Crafts style, 142:93
demilune, 142:92, 146:121
dining,
walnut-pear, 146:102
1700, 146:57
end, 143:90
mahogany-maple, 143:93
finish for, 141:81
leaves of, cupped, 146:148
library,
Arts and Crafts style, 146:63
modern Gothic, 146:61
oak, 1700, 146:57
piecrust, 146:59, 115
after Scott, 145:96
restoring, 146:146
round kitchen, making, 145:56-63
Shaker side, 146:62
Sheraton pier-type, 146:60
tea, 1750, 146:59
trestle,
building, 141:74-81 (erratum, 142:10)
curved, 146:102
drawer for, 144:106
veneered, sunburst, 146:118
workshop, for plywood cutting, 143:71
writing, sapele-iricote, 144:97
See also Lamp stands. Stands.
- Tablesaws:**
cabinet 120v, 145:40
compound angles on, jig for, 143:108-12
contractor's new, reviewed, 140:36
cutoff box for, 146:28
dadoes on, antikickback fin for, 144:108
dust-collection for, 141:84
dust-proofing, 145:64-67
evolution of, 146:74-75
finger-saving mechanism for, 145:38
jointing on, 146:36-38
miters on, no-measure method for, 143:16
moldings on, cove, 146:28
rabbits on, 143:76-77
ripping on, sled for, 145:92-93
riving knives for, European, 144:108
sliding miter jig for, reviewed, 142:34
sliding tables for, reviewed, 144:78-83
spline joints with, 142:100
switches for, foot, 146:26-28
taper jig for, 145:61, 146:36
tenons with, 142:63-65
See also Fences. Miter gauges. Sawblades.
- Tabletops:**
attachment methods for, 141:81, 142:50, 51
with biscuit joinery, 140:22-24
book-matches for, 140:18-20
cock bead for, 142:54, 55
growth-ring orientation for, 146:148
round, cutting, 145:57-58
for small table, 142:53-54
for trestle tables, 141:77, 79-81
See also Breadboard ends.
- Tape:**
cellophane, as clamp, 145:22
duct, for clamping cauls, 143:10
foil, for lock locating, 140:24
for gluing up, 141:46, 48, 49, 50
masking, as drill stop, 146:32
- Tape measures, center-finding, reviewed, 143:38**
- Tapers:**
jigs for, 140:76-77, 78, 145:61
with plane, 142:53
- Teak (*Tectona grandis*):**
color of, and light, 142:44, 45
finishes for, 143:100-2
Telephones, strobe-light indicator for, reviewed, 142:34
Templates:
for cabriole legs, 144:45-46
for dovetails, 143:86-89
Frid's view of, 146:82
for router shaping, 143:82-83
- Tenons:**
with bandsaw, 142:62-63
compound-angle, 143:60-65, 108-12
in curved aprons, 145:62-62
to fit, 141:76
by hand, 142:50-51, 61-62
with horizontal mortisers, 142:67
loose, 143:78, 81-82
commercial system for, 140:42
making, 141:69, 142:65, 66, 67
with radial-arm saw, 142:62-63
with routers, 142:65-67
types of, 142:61
Thickening, with planes, 142:98
Thickness planers:
go/no-go gauge for, 145:88-89
sled for, 145:90-92
system for, 145:88-91
warped lumber through, 145:90-91
Thomas Chippendale School of Furniture, reviewed, 142:24
Tool chests, Studley magnificent, 143:28
Tools:
evolution of, 146:71-77
hand, book on, 140:26
old,
reissue of, 146:73-74
source for, 142:106
parts for, web site on, 140:26
relationship with, 146:86-89, 96-97
Turning:
of beads, 145:84-87
of cabriole legs, 144:46-48
collectors of, 146:95
egg box, 144:94
evolution of, 146:90-95
hollow,
12-in. walnut, 144:96
lidded carved, 144:97
for molded corners, 142:80-81
spindle,
blanks for, 142:69
in duplicate, 142:68-71
patterns for, 142:68, 69
straightedge for, wooden, 142:70
symposiums of, 146:93-95
See also Skews.
- V**
- Varnish, rubbing out, 144:70-71**
- Veneer:**
bandsawing, 143:44-49, 144:66-67
bandsawn, surfacing, 143:48-49
for drawer front, 142:54
iron-on, troubleshooting, 140:98
matching, 143:48, 49
sawing, 142:54, 55
source for, 140:78
taping, 143:48, 49
thin, planing, 144:66
video on, reviewed, 145:26
- Vessels:**
hollow burl, 146:92
pierced, 145:26, 146:90
- Videos:**
on jointer tune-up, 142:39
on mortise and tenon, 142:67
- Vises:**
bar clamp-bench, reviewed, 140:38
bench, with hand screws, 146:36
caps for, 145:40
machinist's, clamping keel for, 144:22
shoulder, removable, 142:18-20
See also Cradles.
- W**
- Walnut (*Juglans* spp.):**
black (*J. nigra*), sapwood staining, 141:102-4
color of, and light, 142:45
- Warner, Patrick:**
on router bits, 140:62-65
on router fence, 144:89-93
on routers for tables, 142:86-89
- Warp, correcting, 143:106**
- Waxes:**
applying, 141:126
choosing, 141:126
colored, overshellac, 141:126
as finish, 141:58, 62-63
for machinery tables, 146:30
mixing, 141:126
pigmented, making, 140:49-50 (addenda, 142:8)
-polish,
defined, 140:47-48
making, 140:48-49
removing, 140:50
solvents for, 140:48
types of, 140:46-47
using, 140:50-51
- Web sites:**
for builders, 145:28
on dust-collection, 141:87
on finishes, 145:28
FWW's own, 143:8
gallery, 144:32
on handsaw chest, 142:24
on lumber, 140:26
musical, 142:24
on plans, 141:26, 145:28
setting up, help with, 144:32
on tool parts, 140:26
on wood shrinkage, 142:24
Wedges, making, 146:110-11
Wheel dressers, choosing, 140:8
White, John, on jointer tune-up, 142:38-43
William and Mary, furniture of, 146:57
Williams, Gary:
on circular saws, 143:70-73
on tying down lumber, 144:72-73
Wood:
annual rings in, orientation of, 146:148
choices of, 145:100-2
cup in, correcting, 146:148
drying, importance of, 146:148
exotic, certification programs for, 146:64-67
oily, sealers for, 145:54
See also Burls.
Wood movement, of kiln-dried wood, 141:96-98
Wood storage, system for, 140:70-71
Woodworking:
with a group, 144:84-88, 130
histories of, 145:8-10
letters about, 146:130-31
skills of, acquiring, 140:96
Workbenches:
carver's swivel-tilt, reviewed, 140:34
designing, 141:54-55
simple, drawered, 143:50-51
Work-Mate, auxiliary jaws for, 141:22
See also Tables: workshop.
Workshops:
in garage, 141:51-55
lighting for, 141:53-54
roof for, 141:52-54
for secretary, building, 144:88
See also Finish rooms.
Wright, Robert S., on dust-detector switch, 143:66-69

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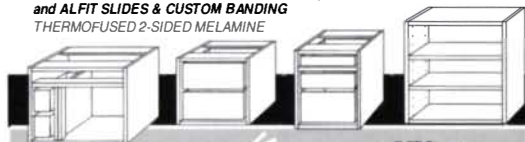
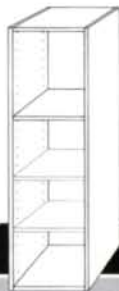
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Tired of sanding? Fed up with the hours of drudgery, the clouds of dust and the high costs? There is one simple tool that can get rid of rasp, saw, gouge and milling marks, shearing away feathery layers at each stroke and leaving a smooth surface.

The principle behind the card scraper is simple: Take a piece of flat steel about the size of an index card. Polish an edge and rub it with a metal bar to create a sharp burr, or hook. Then flex the scraper slightly with your thumbs and push it across the workpiece at an angle that allows the burr to cut the wood.

Unfortunately, many woodworkers balk at the scraper, either giving up after one stab at sharpening and using it or not even trying at all.

But they are missing out on a dirt-cheap tool that can take the place of coarse and medium grades of sandpaper and can be cut or ground into an infinite variety of custom shapes to smooth inlay, moldings, cove cuts and most other curved and flat surfaces. Also, where sandpaper tends to round over nearby details, scrapers cut only where you want them to.

Finally, the card scraper's width is great enough to overlap marks or undulations created by a handplane or cabinet scraper, making it the logical next step in surface preparation. In fact, the card (or hand) scraper is often mistakenly called a cabinet scraper, but the latter is a spokeshave-like tool.

Sharpening is not difficult

Sharpening, or burnishing, a scraper is actually a simple process. It takes a little trial and error to create a usable burr, but you have to learn it only once, and there are a few basic keys to success. With-

out a squarely honed edge to start with, for example, you won't get a razor-sharp burr later.

Whether your scraper stock is square or curved, large or small, the sharpening technique is the same. The first step is done on any previously sharpened scraper but should be unnecessary for a new one. With the scraper lying flat on the bench, the burnisher is forcefully dragged back and forth to flatten the previously turned burr.

The burnisher is made of hardened steel and ideally should be free from nicks and polished to a mirror finish. Burnishers come in a few shapes and sizes. I prefer a cylindrical shape with a conical point, but I believe it's no longer available. These days I suggest the triangular style that tapers to a point.

Leveling and honing the edge—The next step is to place your scraper in a vise with the edge to be sharpened parallel to the benchtop. Draw-file the edge using a mill file, directing your strokes along the length of the scraper. Hold the file at roughly a 45° angle in the horizontal plane. Give thought to filing the edge

straight along its length and square to the sides.

Honing the edge follows. This achieves two things: It removes any file marks and brings the edge to a polished surface, square to its sides. Honing and polishing are done on three surfaces: the narrow edge and the two flat broad sides. I suggest starting with a coarse stone to remove file marks followed by a finer-grit stone. The finer these surfaces are polished, the sharper the edge.

Burnishing—At this stage the scraper is placed back in a vise with the edge to be burnished parallel to the top of the bench. Begin by



Scrapers come in many sizes and shapes. Aside from the standard card and gooseneck shapes, you can grind custom profiles to fit everything from beads to coves and use thin scrapers to wrap around curves.



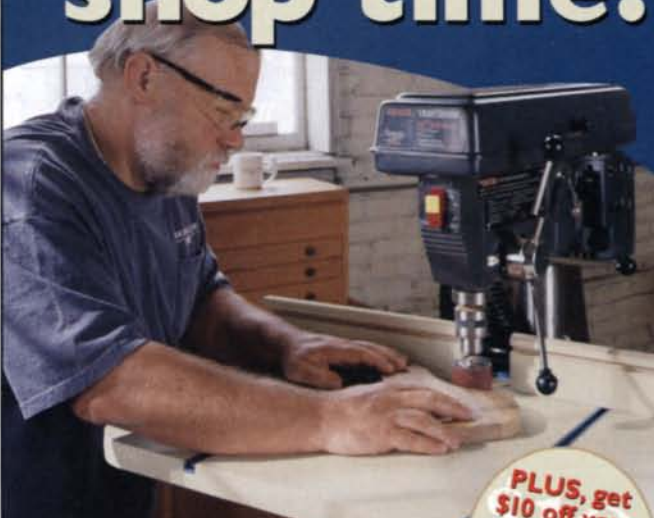
JOINTING THE EDGE

First, level the edge with a mill file. Hold the file at about a 45° angle to the direction of the cut. Take care to keep the file square to the work through the entire stroke.



Then hone each surface. Start with the thin edge of the scraper, moving from a coarse stone to a fine one. Then lap the sides flat.

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Rules of Thumb (continued)

BURNISHING

Creating the hook edge. Start with the burnisher held 90° to the edge. Use firm strokes along the length of the edge, gradually angling the burnisher down to about 80° to create a smooth burr.



drawing the burnisher across the edge, holding the tool at a right angle to the sides. Start with light pressure and increase it with each pass. This flattens any scratch marks left on the surface, again helping to achieve a sharp edge. After four or five passes at the 90° angle, tilt the burnisher slightly for the next pass, which compresses the corner, mushrooming it out along the edge. Do this to both sides of the edge, creating two working burrs.

You might ask what the correct angle is for the burnisher while creating the burr. Think of it this way: The greater the angle of the burnisher, the more you will have to tilt the scraper to get it to cut.

Your burnishing should be firm enough to feel a distinct edge on the scraper. If the edge gets rolled over too far, it can be straightened to a better cutting angle by placing the point of the burnisher behind the burr and dragging it along the inside of the hook, bending it back to a more pleasing cutting angle. This is why I prefer a burnisher that comes to a point.

Next, flip over the scraper in the vise and level, hone and sharp-

en the opposite side. At this point it's best to hold the scraper in the vise between two sticks, which prevents the newly burnished edges from being damaged.

Using a card scraper

The scraper can be held and moved across the wood in various ways. Typically, the scraper is flexed slightly across its length when used. This prevents the corners from digging into the surface. This bend is accomplished by pushing in the center of the tool with your thumbs and pulling with your fingers at the ends, creating an arc across the cutting edge. This is not much of a curve, just enough to lift the ends off the surface.

Tilt the scraper forward at an angle that will turn up a shaving, then push it across the work surface. You also can pull the tool. In this case, use your thumbs to pull off the ends of the tool from the surface and push the center with your fingers.

A word of caution: When a lot of scraping is done, a great deal of friction occurs, which will heat up the tool and can burn thumbs and fingers. Woodworkers employ a variety of tricks to avoid blisters. Some wrap tape around their thumbs. Others place flexible rubber refrigerator magnets on the back of the scraper. There are even holders designed to properly flex the scraper and shield your fingers from the heat buildup. But I have never had a problem using just my thumbs and fingers.

A common pitfall is focusing your efforts in one spot to remove tearout. This can lead to scraping a hollow into the surface of your panel. It may not be noticeable on bare wood but will stand out after a finish has been applied.

Some other useful applications for the scraper are removing file marks after shaping a cabriole leg, or fairing moldings once they have been mitered and attached. Straight, curved and gooseneck scrapers can be purchased, or you can cut and grind your own custom shapes.

Sometimes I take a scraper to a sheet-metal shop and have them shear off a piece to a particular width. Then, back at the shop, I grind it to suit a particular profile. A piece of an old bandsaw blade makes a good scraper blank. A narrow scraper can be wrapped around a curved surface to smooth it.

If you're tired of buying sandpaper and fed up with holding onto a loud power sander that feels like a beehive in your hand, try the scraper. It works great when sharpened correctly, and it keeps the dust down.

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A scraper can handle flat and curved surfaces and areas prone to tearout. A flat scraper, angled slightly to create a shearing action, can level the inlay on a Pembroke table leg (left) and remove rasp marks on a cabriole leg (center). A gooseneck scraper smooths the cove in a bracket foot (right).



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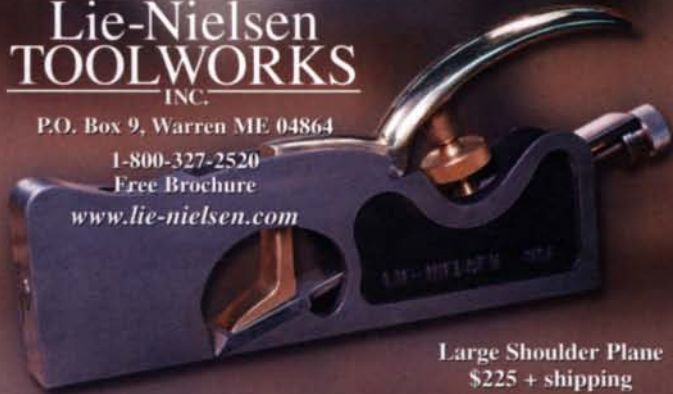
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UTAH – Salt Lake City

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March 9-11

NORTH CAROLINA

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Cashman Center, Las Vegas, NV

March 16-18

NORTHERN VIRGINIA

Capital Expo Center, Chantilly, VA

OHIO – Cleveland

Summit County Fairgrounds, Tallmadge, OH

March 23-25

GEORGIA – Atlanta

Gwinnett Civic Center, Duluth, GA

MICHIGAN – Grand Rapids

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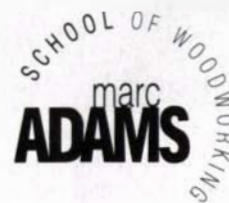
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Q & A

Flattening a sharpening stone

I have inherited what I believe is an Arkansas sharpening stone. While one side is reasonably flat, the other side is worn in the center. What is the best way to flatten such a stone?

—Sam Osipo, Minneapolis, Minn.

Garrett Hack replies: All waterstones and oilstones, natural and man-made, need periodic maintenance to keep their working faces flat. No matter how careful you are to use the entire surface of the stone or how light your pressure, the middle gets the most action and wears hollow. After that, it's impossible to truly flatten the back of a plane iron or chisel.

The price you pay for the fast cutting of waterstones, which are usually considerably softer than oilstones, is that frequent flattening is necessary. Longer-wearing oilstones might need maintenance only a few times a year, as much to renew the glazed-over and dull surfaces as to flatten them.

By far the easiest flattening method is to use a large diamond stone (medium grit or a series of different grits if you are feeling wealthy) lubricated with kerosene for oilstones and water for waterstones.

Rub the two stones together while flushing the surfaces with lubricant. As you work you will see a fresh, flat surface growing from the ends in toward the center. Only a few minutes of effort will flatten a waterstone.

A less expensive alternative is to use a piece of plate glass with either silicon-carbide abrasive powder sprinkled on it or a sheet of coarse (120 to 150 grit) wet-or-dry sandpaper. Use plenty of lubricant and shift the way you hold the stone to get the most even flattening, checking the bottom of the stone periodically. I prefer the abrasive powder for its quick cutting, even though over time it does wear the glass plate. I've seen Japanese craftsmen flatten their waterstones on a smooth face of a cement block. Recently I had good results with the granite step that leads into my shop. It doesn't matter which method you choose but that you keep your stones tuned.

[Garrett Hack is an author and furniture maker in Thetford Center, Vt.]

Oil-lubricated vs. oil-free compressors

I am interested in information on oil-lubricated and oil-free air compressors.

What are the advantages and disadvantages of each for typical shop use—for air tools and paint spraying, for example?

—Don Trapp, Albuquerque, N.M.

Roland Johnson replies: In the consumer marketplace oil-free compressors have appeared in great numbers in recent years. The reason for their proliferation is that oil-free compressors are less expensive to produce than oil-lubricated compressors and can be sold for less.

There is a price to be paid in the bargain, however. Oil-free compressors turn at higher speeds than oil-lubricated compressors, resulting in increased wear and shorter compressor life. Oil-free compressors also tend to be quite noisy. And frequent air-intake filter changes are necessary because the cylinders are usually aluminum and will wear out quickly if dust or debris enters them.

Oil-lubricated compressors, on the other hand, turn at much slower speeds, meaning less heat is produced, substantially lengthening compressor life. Also, oil-lubricated compressors are

FLATTENING A WORN STONE



A large, medium-grit diamond stone makes short work of flattening a waterstone. Use plenty of water and check your progress periodically. Use kerosene as the lubricant when flattening Arkansas stones.

You should see a fresh surface spreading in from the edges as you flatten. The old, hollowed surface is the darker area in the center of the stone.



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much quieter. In fact, some of the slower-turning, two-stage compressors are incredibly quiet considering the quantity of compressed air they produce. Many of the oil-lubricated models on the market can trace their design heritage back to the 1930s and 1940s with little change. Good design is hard to beat.

Air tools and spray-finishing equipment tend to be big consumers of air, both in volume and in pressure. A high-pressure spray gun requires a compressor capable of continuously producing 9 cu. ft. to 11 cu. ft. per minute (cfm) of air volume at 50 psi to 60 psi of pressure. Some air tools, such as die grinders and dual-action sanders, will require even more volume at higher pressures. An oil-free compressor large enough to handle these air requirements will be nearly as expensive as an oil-lubricated compressor.

The only real advantage of the oil-free compressors is that there is no possibility of oil contamination of spray equipment. Oil-lubricated compressors, especially units that have seen a lot of use, can allow oil past the piston rings and into the compressed air, which can

cause significant problems when spraying finishes.

[Roland Johnson runs a cabinet shop in Sauk Rapids, Minn.]

Wood trim around a laminate top

I would like to know how laminate tops are made with wood trim around the edge that is absolutely flush with the top surface of the laminate. When I try to sand down the wood to the correct level, I end up scratching the laminate.

—Jim Orr, Clermont, Fla.

Bill Duckworth replies: I'll confess that I've done a lot more laminate work than I'd prefer to admit. Whether the application is a tabletop with a lumber edge, as you asked about, or bookcase shelves or melamine cabinet face frames, I always employ a tongue-and-groove joint where wood meets plastic.

For ¾-in.-thick core material, rout both sides so that you end up with a tongue that is ¼ in. thick by ¼ in. deep. Routed plastic-laminate edges are razor sharp, so always ease those edges slightly using a sanding block with 150-grit sandpaper. This will create a slight groove between

the wood and the laminate, which will disguise any irregularities. You can omit this step if you want a completely flush transition from laminate to wood and you are sure the sharp laminate edge is not sticking up even slightly anywhere along the edge. Do a dry-fit to check this. If you laid up the laminate yourself, using contact cement, count on the edge thickness being slightly irregular.

Mill the lumber to the correct thickness and width, making a few extra pieces to use for test cuts in setting up your grooves. You can easily groove the inside face on the table saw by using a dado blade or by making several passes with a regular sawblade. You want a snug fit, one that will slip on and off without a lot of force. Also, it's a good idea to cut the groove an extra ⅛ in. or so deeper than the tongue, so that when you glue it in place there's somewhere for the extra glue to go.

In most cases it's easier, neater and cleaner to put a finish on the wood before gluing it to the laminate because it saves you the time and trouble of adding masking tape to all of the joints later. [Bill Duckworth is an associate editor.]

Router speed controllers

I would like to slow down my grinder from 3,450 rpm so I don't burn chisel and knife edges when sharpening. Will one of those router speed controllers work on my grinder motor?

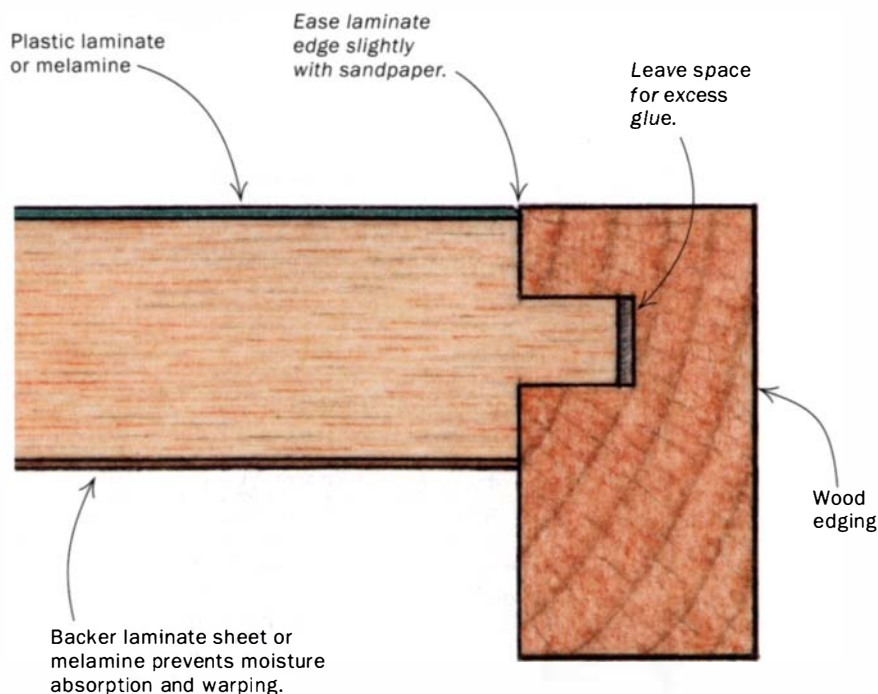
—Calvin Lynn, New Orleans, La.

Asa Christiana replies: Jason Knapp, who is on the technical staff of Woodcraft Supply Corp., said aftermarket electronic controls do not work on induction motors, such as those on bench grinders. The capacitor on an induction motor will blow the fuse on the electronic control. Most stationary machines in the shop—drill presses, table saws, bandsaws, jointers, lathes—use induction motors.

Aftermarket router speed controllers are designed for universal motors—those with replaceable brushes. These motors are also used in hand drills, circular saws and other portable power tools.

You can reduce the speed of your grinding setup by means of pulleys, with the grinding wheel mounted on a separate mandrel, or you can just get a

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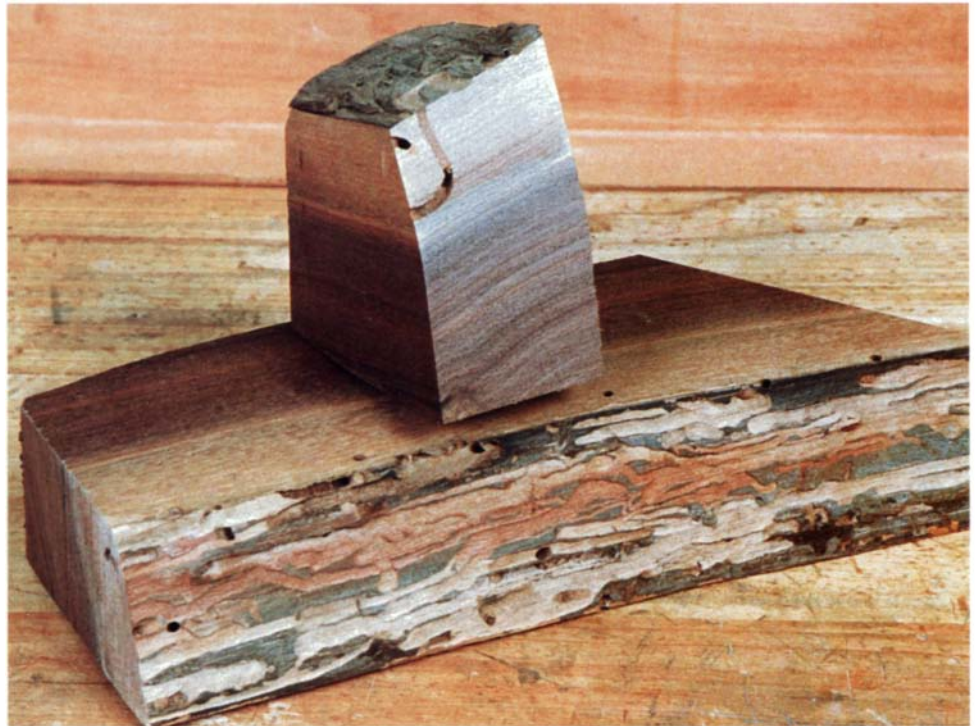
slower motor. To avoid burning your tools, try a 1,750-rpm motor with an aluminum-oxide grinding wheel. [Asa Christiana is an associate editor.]

Getting rid of worms in wood

I am resawing some thick walnut branches. There are white wormy bugs beneath the bark and occasionally deeper into the wood. How do I kill the bugs without ruining the wood, building a special chamber or spending a lot of money? —Dan Danks, via the Internet

Jon Arno replies: Upon close examination, you will probably discover that the worm damage in your walnut is confined to the sapwood. Walnut heartwood is quite resistant to the larvae of most of our domestic beetles. The practical solution is simply to trim off all of the sapwood before stacking the lumber for drying.

If you were dealing with some of the more susceptible species, such as ash or maple, there would be far more cause for worry and precious few practical



Removing wormy areas from walnut is simply a matter of trimming away the sapwood. Generally, worms veer away when they hit walnut heartwood. Killing worms in other species requires heat or pesticide.

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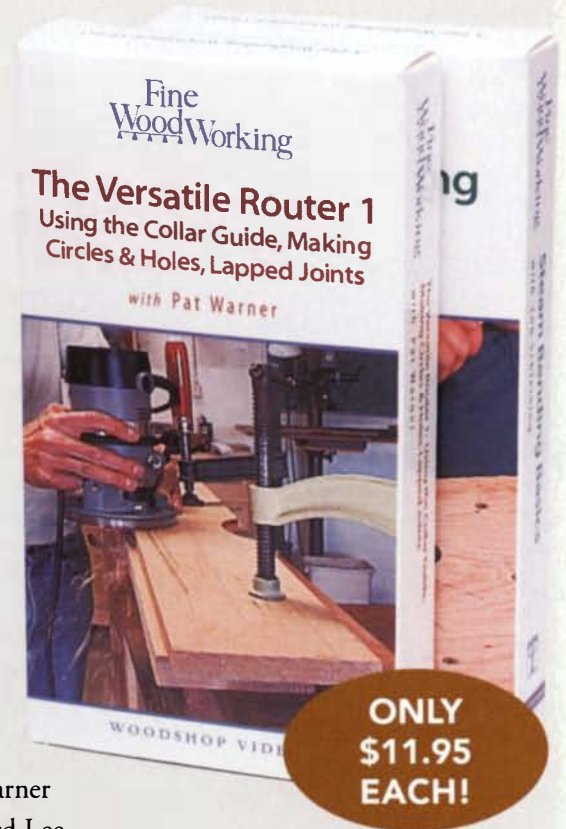
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Starting to Finish • Michael Dresdner

Master finisher Michael Dresdner sets the stage for a perfect finish. He discusses classic, surface-preparation problems and solutions; he shows how to recognize and remove dents, how to identify and fill gouges, how to pre-raise wood grain to get the best results under water-borne finishes, and, most important, how to sand properly.

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solutions—short of having the wood professionally kiln-dried.

Wood can be sterilized in several ways: with heat, by fumigation or by applying chemicals. For the average woodworker, all of these solutions have limitations.

Small pieces of infested wood can be put in an oven and heated to 190°F for about an hour per inch of thickness. With varying degrees of success, small pieces can also be fumigated by putting them in a plastic bag, spraying them liberally with a bug bomb, and tying the bag closed for a day or two. Certainly, soaking the wood in commercially available pesticides will kill the worms, but I do not favor this approach or even the use of bug sprays. Not only are these chemicals a toxic risk for a woodworker, but they also give the wood an oily feel and impregnate it with a noxious odor.

For longer boards and larger inventories, it is possible to scale up on any of these procedures by building an enclosed heat or fumigation chamber, or by setting up a dipping trough. However,

at some point, practicality and common sense suggest either hauling the load to a commercial kiln or putting it on the firewood pile.

[Jon Arno is a wood technologist and wood consultant in Troy, Mich.]

Brushing and waxing problems
I'm finishing a cherry desktop. After a coat of boiled linseed oil, I brushed on a high-gloss varnish, and the surface looked like it had thousands of pinholes. The problem did not occur with satin varnishes. I suspect the linseed oil is to blame, but I wiped off the excess and let it dry for a day before applying the varnish. I also have had a problem when waxing the surface as a final step. I can't seem to get a uniformly glossy surface. The desktop is large, so I have been working in areas of about 1 sq. ft. or 2 sq. ft. —Tom Abbot, Boulder, Colo.

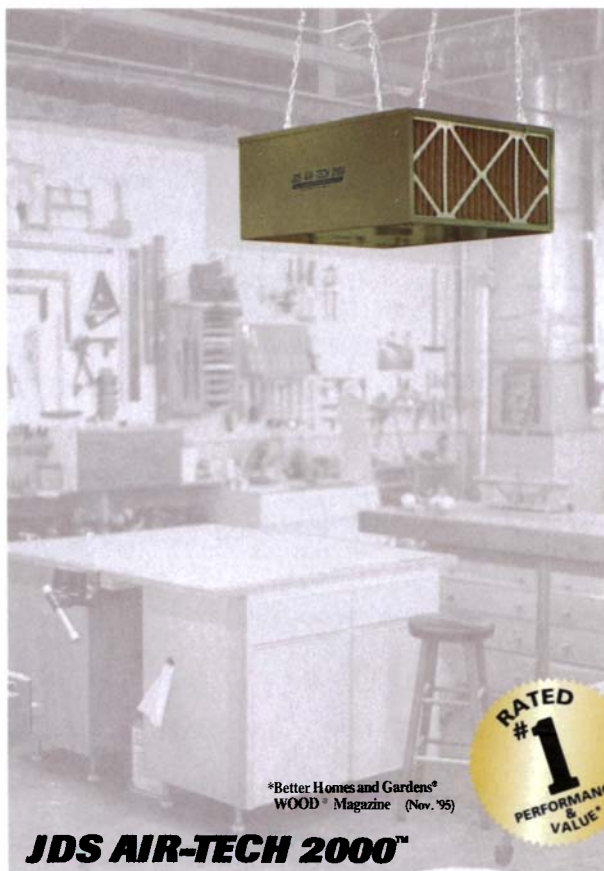
Chris Minick replies: The linseed oil is not to blame for the pinhole problem; it is your brushing technique. I suspect you

are overbrushing the finish. Both varnish and shellac should be flowed onto the surface with a slow, unidirectional brush stroke. The choppy, back-and-forth stroke commonly used to apply paint to walls forces millions of tiny air bubbles into the wet coating. During the drying process the bubbles form pinholes when they break the surface.

Wax should be applied to the entire surface, then buffed. Applying the wax in small adjoining squares leads to buildup around the edges of each square (the center has one coat, the edges have two). Once buffed, the edges will appear glossier than the body of the square. Apply wax to the whole surface, then buff, and you will see a difference immediately.

[Chris Minick is a consulting editor.]

Do you have a question you'd like us to consider for the column? Send it to Q & A, Fine Woodworking, P.O. Box 5506, Newtown, CT 06470-5506 or e-mail it to fwqa@taunton.com.



Better Homes and Gardens
 WOOD Magazine (Nov. '95)

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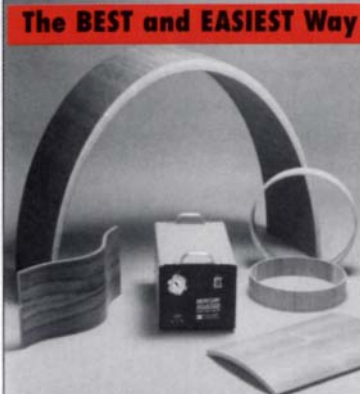
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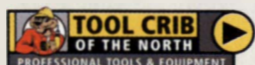
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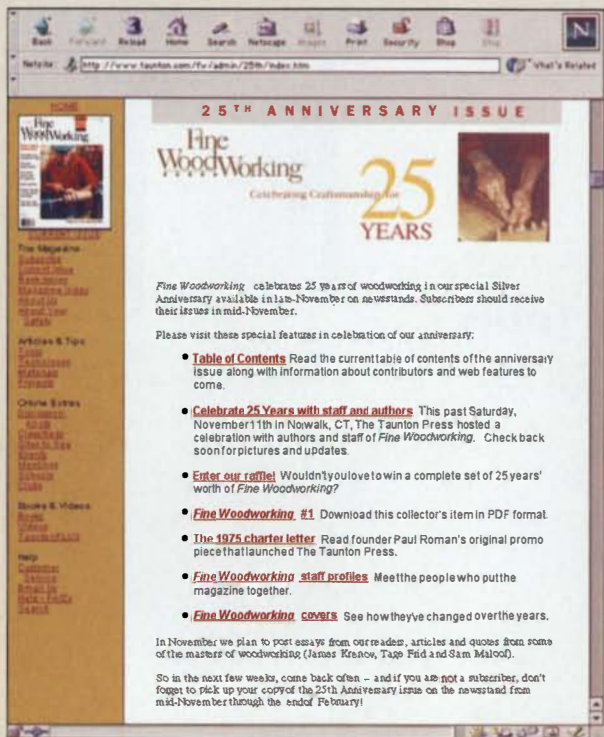
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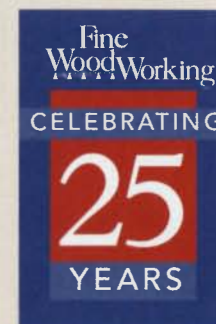
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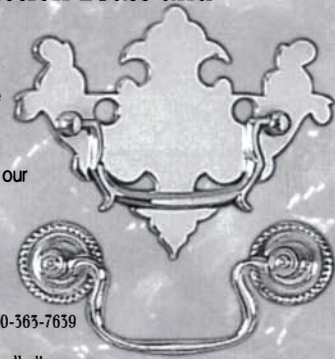
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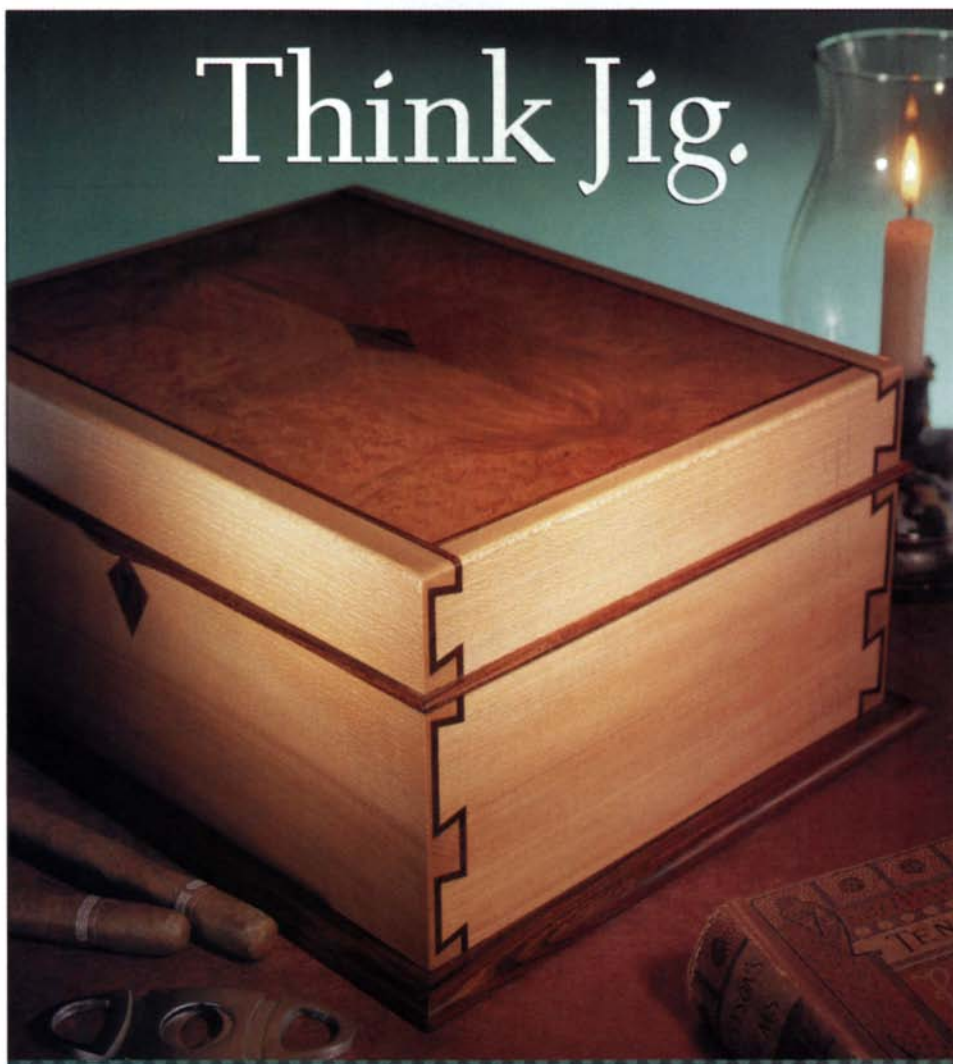
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Master Class

Shape bracket feet in any style using the bandsaw



BY RANDALL O'DONNELL

Bracket feet have held up furniture for more than 300 years. Like most enduring elements, they have weathered changes in style but never went out of fashion. Simple, straight bracket feet date to the Queen Anne Period. Eventually they became more sophisticated and evolved into a graceful ogee (late Queen Anne), many variations of which exist. As rendered in some Chippendale and Federal work, they are slimmed down and called French feet.

I made my first set of ogee bracket feet about 15 years ago for a little New England-style blanket chest. I wasn't quite sure how to start, so I did some research that suggested I get an antique molding plane to shape the ogee. But finding such a plane in working order involved time and a bit of luck. I also knew that shaper cutters could be found to cut the profile. That, however, was an expensive option. So I went to the scrap bin and started experimenting with jigs. The solution turned out to be simple and involved the bandsaw. I've been making bracket feet this way since.

My jig consists of a plywood base and a post screwed to it. That's it. With a bracket-foot blank mounted on the jig, and the profile penciled in on one face of the stock, I can cut any shape, from any period, without the need of expensive shaper cutters or rare molding planes. Poor boys have poor ways.

FURTHER READING

The Gentleman and Cabinet-Maker's Director by Thomas Chippendale (Dover Publications, 1966)

Furniture Treasury by Wallace Nutting (IDG Books Worldwide, 1949)

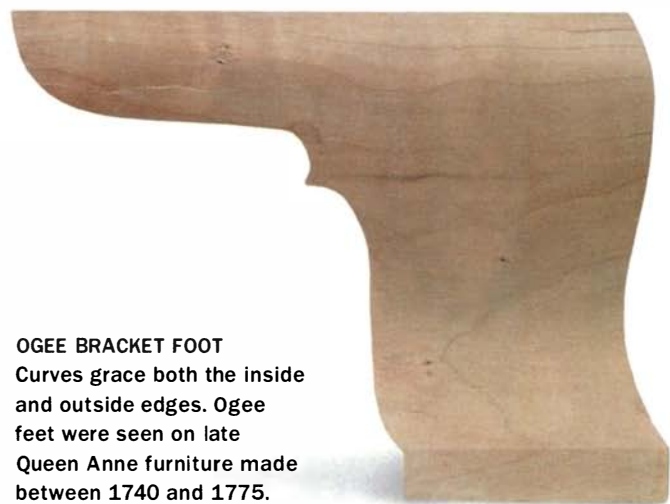
The Four Books of Architecture by Andrea Palladio (Dover Publications, 1976)

The American Builder's Companion by Asher Benjamin (Dover Publications, 1969)

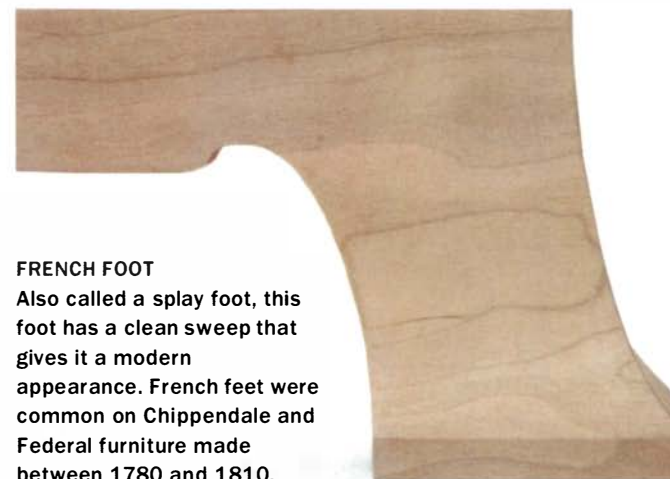
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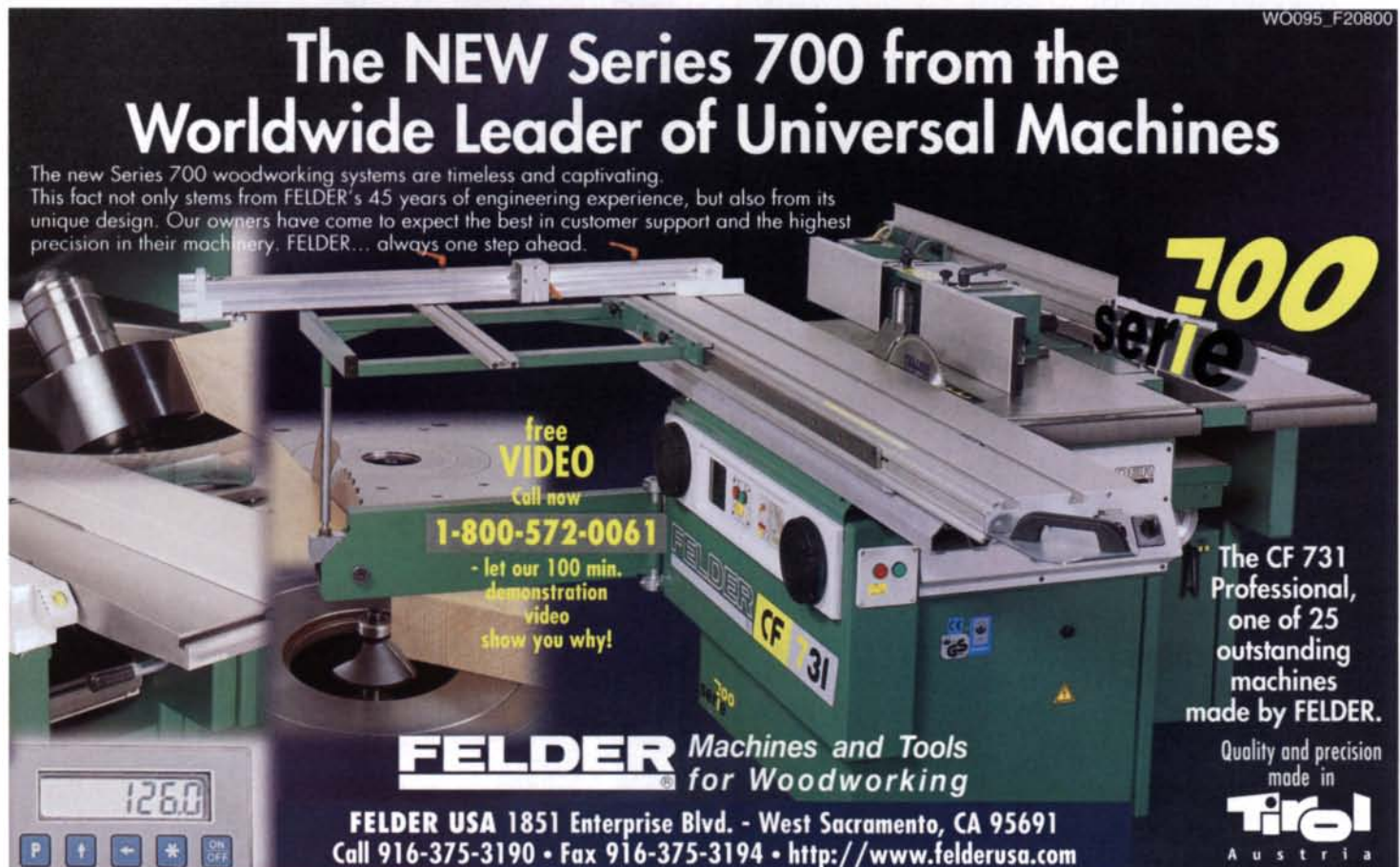
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The foot derives its strength from an internal spline and a corner block. Although the corner block is screwed in place for the glue-up, to remain true to the period the author replaces the screws with antique nails before attaching the foot to the case.

MAKING AN OGEE BRACKET FOOT

START BY ASSEMBLING THE FOOT



Cut a slot for the spline on each face of the miter. The author makes the cut on the table saw with the blade set at 45°.



Rout a stopped rabbet on the upper inside edge of each leg half. Then square the end of the rabbet with a chisel.

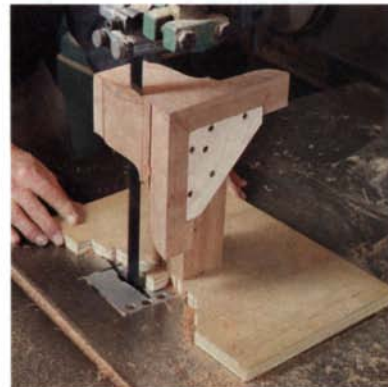


After bandsawing the foot's inner profile, assemble the halves. Use small bar clamps to close the joint, then strengthen it with a corner block glued and screwed into the rabbet.

BANDSAWING THE PROFILE



Mount the blank to the jig by screwing through the corner block. The jig consists of a post of solid wood screwed onto a piece of plywood large enough to balance the assembly while it's being bandsawed.



Cut the outer profile. The author nibbles away at the shape and cuts from both directions as needed.



Reposition the stock on the jig to cut the other face. The glue line serves as the layout line because it follows the profile exactly.



Use rasps and files to fair the surfaces. Finish by sanding, but take care not to round over the crisp edges.

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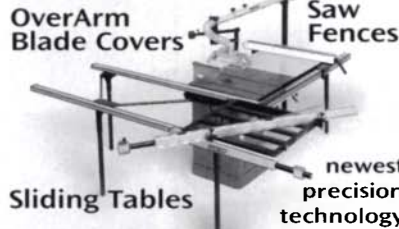
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INDEX TO ADVERTISERS

Use reader service card - inside back cover.

Reader Service No.	ADVERTISER, page #	Reader Service No.	ADVERTISER, page #	Reader Service No.	ADVERTISER, page #	Reader Service No.	ADVERTISER, page #
80	A & I Supply, p. 35	78	Dimestore Cowboys, p. 119	88	L.R.H. Enterprises, Inc., p. 97	130	Sawheler, p. 13
205	Adams Wood Products, p. 11	152	Dimitrios Klitsas, p. 122	206	Laguna Tools, p. 7	102	Scherr's Cabinet & Doors, p. 113
236	Advanced Measuring Systems, p. 95	1	Dust Boy, Inc., p. 122	207	Laguna Tools, p. 17	107	Sharp Tools USA, p. 119
173	Airware America, p. 118			209	Laguna Tools, p. 27	12	Shopbot Tools, Inc., p. 40
45	Allred & Associates, p. 120	231	Eagle America, p. 122	208	Laguna Tools, p. 92	57	Smithy Super Shop, p. 40
247	Amazon/Tool Crib of the North, p. 17	227	Eagle Tools/EuroShop, p. 97	98	Laughing Loon Custom Canoes, p. 120	141	Southern Union State Community College, p. 120
248	Amazon/Tool Crib of the North, p. 27	8	Ebac Lumber Dryers, p. 121	6	Launstein Hardwoods, p. 40	165	Sunhill Machinery, p. 103
224	Amazon/Tool Crib of the North, p. 111	46	ECOGATE, Inc., p. 9	125	Lee Valley & Veritas, p. 28	175	Sun-Mar Corporation, p. 122
246	Amazon/Tool Crib of the North, p. 117	221	Econ-Abrasives, p. 35		Leigh Industries, p. 113		
145	American Furniture Design, p. 120	136	Electrophysics, p. 35		LeNeave Supply Company, p. 30	48	Talarico Hardwoods, p. 118
222	American Turbine, Inc., p. 36	142	Emperor Clock LLC, p. 106	32	Librawood, p. 118	86	Target Enterprises, p. 110
137	Anderson Ranch Arts Center, p. 113		Engraving Arts, p. 118	47	Lie-Nielsen Toolworks, p. 97	43	Tech Mark Inc., p. 35
117	Apollo Coat, p. 30	4	Exaktor Precision Woodworking Tools, p. 118	68	Lignomat Moisture Meters, p. 97	77	Tech-Wood Inc., p. 120
22	Apollo Sprayers, p. 95	204	Fairview Marketing, LLC, p. 7	41	Logosol, p. 95	153	Tenryu America, Inc., p. 21
89	Arrowmont School of Crafts, p. 106	82	Farallon Industrial Knives, p. 98		Londonderry Brasses, p. 103	40	The Windsor Institute, p. 122
81	Ashman Technical Ltd., p. 113	64	Felder USA, p. 115	187	Luthiers Mercantile Intl, p. 33	35	Thomas Golding School, p. 118
167	Auton Company, p. 26	226	Festo Tooltechnic/Toolguide, p. 21	52	MEG Products, p. 119	157	Timberking, p. 40
			Fine Woodworking Woodshop Videos, p. 107	21	MacBeath Hardwood Co., p. 121	71	The Tool Chest, p. 121
170	Ball & Ball Reproduction Hardware, p. 113		Fine Woodworking Anniversary, p. 98	199	Makita U.S.A., p. 15	144	Toolmart, p. 95
58	Bauhaus Apprenticeship Institute, p. 117	219	First Cut Bandsaws, p. 118	228	Makita U.S.A., p. 105	225	Tools On Sale, p. 37
53	The Beall Tool Co., p. 121	218	Flamingo Specialty Veneer, p. 120	211	Marc Adams School of Woodworking, p. 27	198	Tools4Less.com, p. 120
217	Bench Dog, p. 35	233	Flexaust, p. 7	39	Martin Donnelly Antique Tools, p. 121	9	Tropical Exotic Hardwoods, p. 122
92	Berea Hardwoods, p. 27		Forrest Manufacturing, p. 41	139	Mass Bay Wood Products, Inc., p. 117	169	Turnings Unlimited, p. 122
91	Berea Hardwoods, p. 109	162	Fuji Industrial Spray Equip., p. 92	150	McFeeley's Square Drive, p. 23	120	Tyler Tool Company, p. 113
97	Better Built Corp., p. 110	14	Furniture Designs, p. 121	203	Mercury Vacuum Presses, p. 109	168	Universal Laser Systems, p. 23
185	Biesemeyer Mfg., p. 11	7	The Furniture Institute of Massachusetts, p. 121	122	Microplane, p. 106		University of Rio Grande, p. 121
105	Blue Moon Exotic Wood, LLC, p. 121	151	G & W Tool Company, p. 109	49	Misugi Designs, p. 23	234	Vac-U-Clamp, p. 106
129	Bottom Line Tools, p. 110	159	Garrett Wade Company, p. 19	62	W. Moore Profiles, p. 11	213	Vass, Incorporated, p. 92
66	BrandNew, p. 117		Gilmer Wood Company, p. 119	44	Murray Clock Craft Ltd., p. 122	216	Vega Enterprises, p. 9
	Bunk Bed Specialties, Inc., p. 122	51	Goby's Walnut Wood Products, p. 120		Museum of Woodworking Tools, p. 122	244	Versa Tool, p. 92
	Cabinetparts.com, p. 120	93	Good Hope Hardwoods, p. 119		Noah's, p. 118	239	Virutec.com Inc., p. 7
110	Calif. Contemporary Craft Guild, p. 118	10	Gorilla Glue, p. 33	108	North Bennet Street School, p. 117	115	WGB Glass, p. 35
18	Cambium Books, p. 121	166	Gougeon Brothers, p. 117	181	Northend Hardwoods, p. 119	85	Waterlox Finishes, p. 103
	Center for Furniture Craftsmanship, p. 109	54	Grand River Wood, p. 122	220	Northland Forest Products, p. 118	63	West Penn Hardwoods, p. 118
172	Certainly Wood, p. 119	132	Groff & Groff Lumber, p. 95		Northwest Timber, p. 120	61	Western Tool Supply, p. 39
23	The Chippendale School of Furniture, p. 120		Guitar Making, p. 119	55	Norwood Sawmills, p. 119	36	Wetzler Clamp Company, p. 122
	Christopher Faulkner, p. 120	194	HTC Products, Inc., p. 23	126	Oakwood Veneer, p. 118	33	Wilke Machinery Co., p. 9
131	Classic Designs by Matthew Burak, p. 95	65	Hammer USA, p. 21	94	Olympia Steel Buildings, p. 12	223	Williams & Hussey, p. 109
193	Clayton Machine Corp., p. 12		Hardwood Warehouse, p. 121	174	Oneida Air Systems, p. 117	112	Winkler Wood Products, p. 122
230	Colonial Saw Company, p. 39	96	Hardwood Web.com, p. 119	161	The Original Saw Company, p. 97	158	Wood River Veneer, p. 122
5	Colonial Times Clock Co., p. 118		Hartville Tool Company, p. 9	87	Packard WoodWorks, p. 119	100	The Wood Works Book & Tool Co., p. 121
101	Compliant Spray Systems, p. 26	11	Hearne Hardwoods, Inc., p. 98	119	Panasonic Professional Cordless Tools, p. 93	13	Wood Write Ltd., p. 118
186	M.L. Condon Company, p. 106	17	HerSaf/Safranek, p. 115	106	Patrick's Turning Point, p. 119	146	Woodcraft Supply, p. 31
90	Conover Lathes, p. 33	140	Highland Hardware, p. 11	201	Paxton Hardware Company, p. 120	147	Woodcraft Supply, p. 115
3	Conover Workshops, p. 122	109	Historic Woodworks, p. 119		Peck Tool, p. 30	75	Woodfinder by Woodrose, p. 103
197	Cormark International, p. 117		Impact Poly Hammers, p. 103	2	Penland School, p. 120	156	Woodjoy Tools, p. 118
31	Creative Accents, p. 122	116	Incra Tools, p. 30	195	Performax Products, p. 23	155	Woodmaster Power Tools, p. 36
243	Custom Wood Turnings, p. 119	121	International Hose Supply LLC, p. 13		Plans Now, p. 122	155	Woodmaster Power Tools, p. 110
79	The Cutting Edge, Inc., p. 120	191	Irion Lumber Co., p. 121	177	Pootatuck Corporation, p. 39		Wood-Mizer, p. 103
		179	Iurra Design, p. 11	196	Powermatic Machinery, p. 38		Woodpeckers, p. 39
				232	Protimeter North America, p. 13		Woodpeckers, p. 98
		214	JDS Company, p. 108	138	Quality VAKuum Products, p. 92	27	Wood-Ply Lumber Corporation, p. 122
178	DCT Holdings Corp., p. 118	38	Jack Goosman, p. 120			15	WoodRat, p. 40
84	Dakota Alert, Inc., p. 12	113	Japan Woodworker, p. 36	95	Rare Earth Hardwoods, p. 117	26	Woodsmith Store, p. 12
133	Dakota County Technical College, p. 110	235	Jasper Audio, p. 119	163	Ridge Carbide Tool Company, p. 122		Woodsmith Store, p. 120
148	Dana Robes Wood Craftsmen, p. 118	135	Jet Equipment, p. 2-3	202	Ridgid Power Tools, p. 25	127	Woodworker's Depot, p. 115
176	David Warren Direct, p. 118	210	Jointech, p. 110	212	Robert Larson, p. 120	192	Woodworkers Discount Books, p. 120
67	J.B. Dawn, p. 117	229	Julius Blum Inc., p. 39	103	Rockingham Community College, p. 121	76	Woodworker's Hardware, p. 26
184	Delmhorst Instrument Co., p. 17	180	Katana Bits, p. 103	242	Rockler, p. 95	111	Woodworker's Source, p. 119
154	Delta Machinery, p. 127	200	KatieJig, p. 30	50	Router Bits on the Web, p. 109		The Woodworking Shows, p. 100-101
114	Denray Machine, p. 13	143	Keller & Company, p. 23	30	St. James Bay Tool, p. 117	74	Worcester Center for Crafts, p. 98
245	Dewalt, p. 99	215	Klingspor Corporation, p. 33	28	Sandy Pond Hardwoods, p. 121	237	World Timber Corporation, p. 121
69	Diefenbach Benches, p. 121	20	KregTool Company, p. 109			99	Yankee Hardwood Specialties, p. 121
104	Diefenbacher Tools, p. 121	70	Kremer Pigments, p. 119			24	Yesterday Design Build School, p. 7

Obtaining the luster of just-planed wood

From rough to smooth. Sanding to a high enough grit will eventually help produce a surface that appears freshly planed. The left panel was sanded with 150-grit paper, while the right panel was abraded with an Abralon 4,000-grit pad made by Mirka.



Two finishes that preserve the hand-planed look. The left panel was finished with a single coat of water-based lacquer, while the right panel was finished with padded shellac and a coat of wax.



Applying a finish generally improves the look of wood, which is just as well, because that is what I am paid to do. On more than one occasion, however, I have fallen in love with that just-planed look, the subtle shine and iridescence that can come only from using a freshly tuned handplane. But how do you preserve this beauty? An unfinished wood surface will eventually oxidize to a dull, lifeless-looking surface, not to mention being prone to stains and other damage.

Most woodworkers I know typically reach for a can of oil when they want to achieve a natural-looking finish. However, these products deepen the color and add an unwanted yellow cast to light woods, a change that will intensify over time, particularly if linseed oil is applied.

Some time ago I was issued a challenge by a demanding customer. The piece was to be made of curly maple, and I had prepared a few samples with alternate finishes. When she came to the shop to approve one of these finish selections, I could tell right

away that she wasn't impressed: She immediately asked if I had any more ideas, because the samples I had prepared looked "too artificial." I tried to explain that any finish will alter the color of wood and deepen the figure, and to illustrate, I wiped the unfinished sample with some distilled water. "That's it," she said gleefully, "that's the finish I want. I want to see the figure and the wood but not the finish!" This seemed a daunting task, even for a guy who makes his living putting on finishes, but eventually I came up with a solution I call "minimal finishing."

That fresh, handplaned look

The unmistakable luster of freshly handplaned wood is achieved by a combination of the razor-sharp blade cutting the wood fibers, followed by a slight burnishing action of the metal (or wood) plane body on the wood. Sanding and scraping tears cellular material and leaves a dull surface. But if your planing skills aren't quite up to snuff, don't worry, because my step overcomes this. I

Preparing the surface. With a sanded surface, not planed or scraped, start by burnishing it with a 500-grit Abralon pad.



Clean the pad regularly. To maintain the effectiveness of the pad, remove it from the sander and clean it with a few blasts of compressed air.



Finish Line (continued)

Wipe on the shellac. A 1½-lb. cut of super-blond shellac provides protection but with minimal alteration to the wood's appearance once dry.



use Abralon, a new cushioned abrasive that's anchored to a foam pad and is available in grits from 500 through 4,000.

Made by Mirka Abrasives Inc., it was originally developed to rub out gel coats on fiberglass boats and camper shells. It attaches to any random-orbit sander that's equipped with a hook-and-loop-type base. And although Abralon is available only in 6-in. discs, it is fine to use the product with either a 5-in. or 6-in. sander. With a planed surface I go right to the 4,000 grit, but after scraping I'll work up from 2,000 grit, and if I've sanded the wood I start with 500 grit.

These pads are used just like sandpaper, but they won't level the surface; they'll only polish it. Periodically remove the pads and



Polish the shellac coat. A 4,000-grit Abralon pad cuts down any raised grain. The pads are flexible enough to be used for hand-sanding small areas.



blow the sawdust out with compressed air or whack them against the edge of your bench.

The finishes

The underlying idea here is to burnish the wood. This keeps the finish primarily at the surface, which deepens the color the least and allows a subtle shine. To achieve this, it's best if you use film-forming, non-oil-based finishes, my favorites being shellac and either water-based or solvent-based lacquer. The water-based finish typically provides the least amount of color shift, keeping the wood closer to its natural color, but it raises the grain. The shellac and the solvent-based lacquer are easier to apply, but both deepen the color a bit. The best way to decide which one to use is to practice on samples.

If you go with shellac, use a 1½-lb. cut of super-blond dewaxed grade. Simply rag on the finish as quickly as you can, then wipe off the excess immediately. For spraying, just spray a full, wet coat. Once the first coat is dry, sand the surface with the 4,000-grit Abralon to smooth it and knock down any raised grain, then repeat these steps for a second coat. A solvent-based lacquer is applied the same way.

If you favor a water-based finish, thin the material about 20% with water, and then either wipe or spray it on in the same way as shellac. The water-based finish will raise the grain; so you may need to backtrack to the 1,000-grit pad and work back up to 4,000 grit to do this operation efficiently. Apply another coat in the same manner as above.

If the wood looks fine to you, leave it. But because I can't help but tinker with finishes, I usually apply a topping of wax and buff it to a semigloss shine.

I find the easiest way to apply this is to take a golf-ball-sized chunk of clear wax (use dark wax on open-pored dark woods like walnut or mahogany) and drop it in the center of a 12-in. by 12-in. piece of cotton cloth. An old T-shirt works best. Fold up the corners and turn them so that the wax starts to squeeze through the cloth on the other side. Then use this wax ball to apply an even, light coat of wax over the surface and buff it with a clean cloth as soon as it starts to haze.

For the nearest retailer of Abralon, contact Mirka (800-843-3904); the product is available from Woodworkers Supply Inc. (800-645-9292).



A ball of wax. A golf-ball-sized piece of wax is placed in the middle of a 1-ft.-square piece of cotton cloth. The wax is squeezed through the cloth in a tight ball with the open end twisted closed. Use this wax ball to rub in a thin coat over the smoothed shellac finish.

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Battle of the Bulge

Terry Moore's harlequin desk, inspired by the motley-clad figures of Pablo Picasso, was a great idea in theory, but the curved, veneered panels proved to be a nightmare in practice. It took the New Hampshire furniture maker four tries to overlay the diamond pattern successfully onto the subtly bulging panels.

Again and again the seams opened between the diamonds, which are made of curly maple and pressure-dyed tupelo. After reducing the size of the bulge and "tapping the dickens out of all the joints," Moore got the seams to hold. Unfortu-



nately, however, each panel had warped "like a banana" along the 60° grain line of the overlay.

Moore eventually came up with the idea of double-veneering—counter-veneering on both sides before applying the harlequin pattern and corresponding back-side veneer. The preliminary sheets of veneer were

laid down with their grain perpendicular to the grain in the diamond pattern. It worked, and the craftsman was able to complete his most ambitious piece. For more on the work of New Hampshire's master furniture makers, see pp. 75-79.