

RODALE'S AMERICAN WOODWORKER

FEBRUARY 1994 #36

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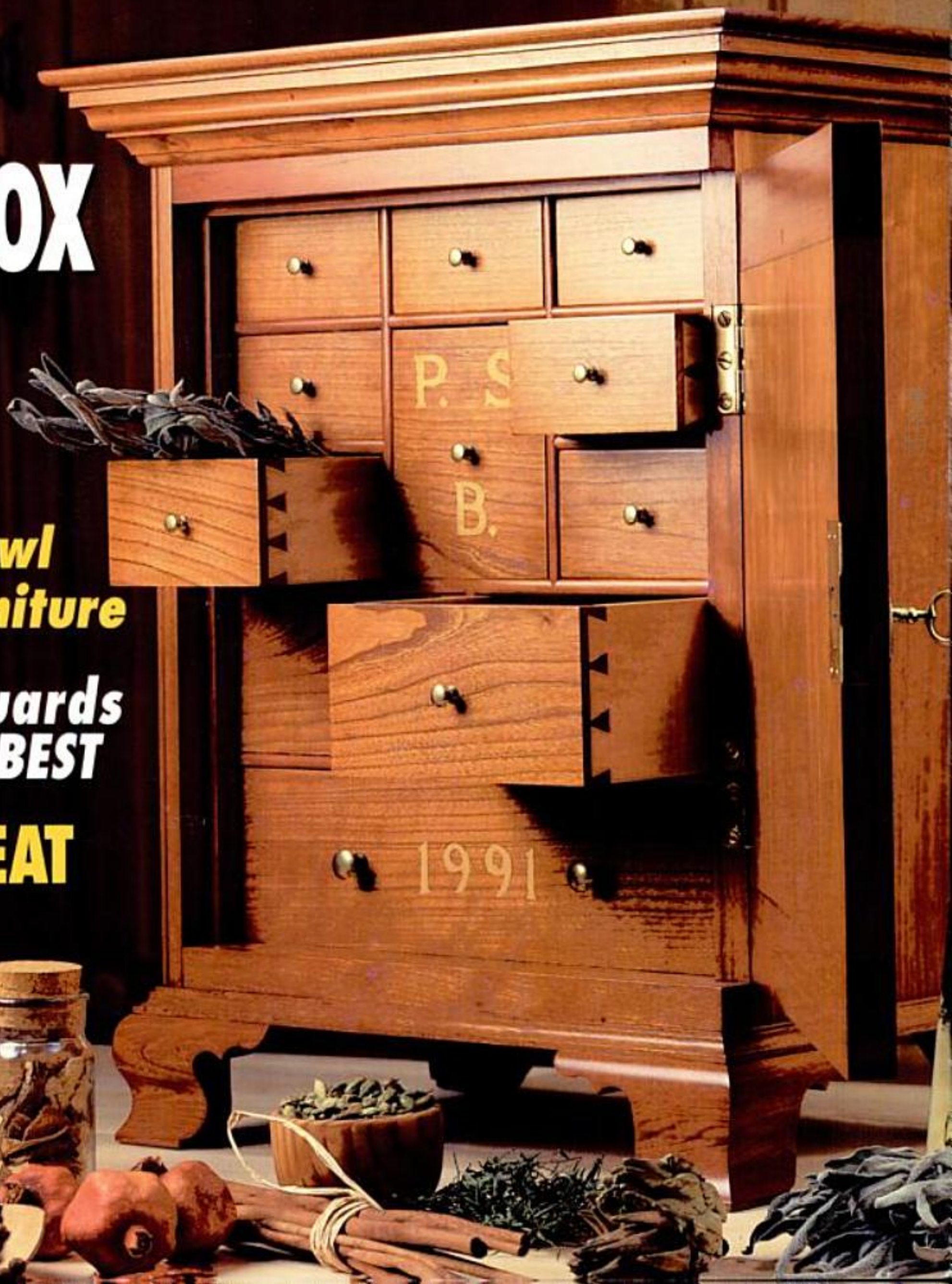
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Issue No. 36 January/February 1994
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Spice Box by Craig Bentzley.



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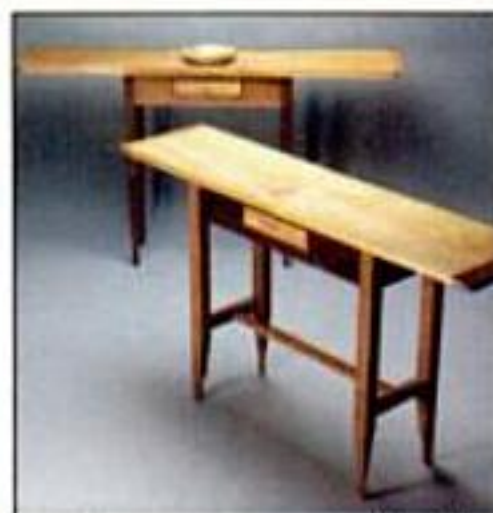
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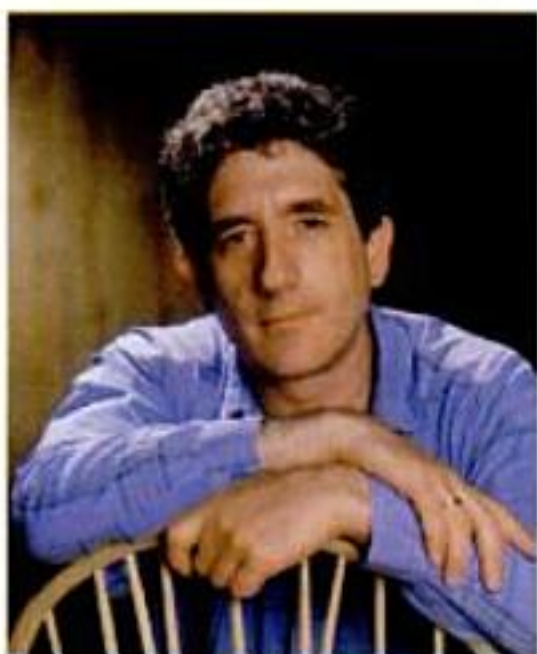
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A WORD FROM THE EDITOR



WOODWORKERS: THE NEXT GENERATION

Judging from the sea of gray heads we see at the woodworking shows and seminars we attend, it would be easy to conclude that woodworking is a pastime of middle-aged men. Not that there's anything wrong with that, mind you—I've got more than a few gray hairs of my own—but it doesn't bode well for the future of our craft. Unless the next generation picks up the chisel, so to speak, all the skills that we've worked so hard to acquire will pass from this earth along with us. Knowledge is one thing you *can* take with you.

It wouldn't be the first time this happened. Amateur woodworking enjoyed a surge in popularity at the turn of the century thanks, in part, to the influence of John Ruskin, Gustav Stickley and other figures in the Arts & Crafts movement. Stickley's magazine, "The Craftsman," provided instructions and plans for amateur furniture makers but folded in 1917 after 15 years of publication. Preoccupied as they were with picking up the pieces of World War I, the younger generation had little time to indulge in the pleasures of woodworking.

It wasn't until the craft revival of the early 1970s that interest in woodworking peaked again. But the craft had lost its teachers by then, and we had to rediscover, by trial and error, the tech-

niques that were lost.

Could this happen again? Perhaps. Many young people don't have time for woodworking today. It's tough to make a living in today's depressed job market, and electronic diversions like Nintendo, VCRs and MTV compete for what free time remains. Plus, mandatory shop class—where many of us got an introduction to woodworking—is largely a thing of the past.

But what good is a tale without a happy ending? It turns out that young people *are* getting involved in woodworking—they're just not as visible as the middle-aged guys. According to data from "Woodworking in America," an independent study commissioned by AMERICAN WOODWORKER in 1993, 33 percent of America's 17 million hobbyist woodworkers are between the ages of 18 and 34. Only 24 percent of all woodworkers are 55 and up. (The average age of woodworkers is 44.)

And young people are doing some phenomenal work. The most creative entries in the 1993 Excellence in Craftsmanship competition were in our student division. You can see for yourself on page 54. Looks like woodworking's future is safe and secure.

David Sloan
Editor & Publisher

AMERICAN WOODWORKER

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Router Basics, Router Handbook, Router Jigs and Techniques



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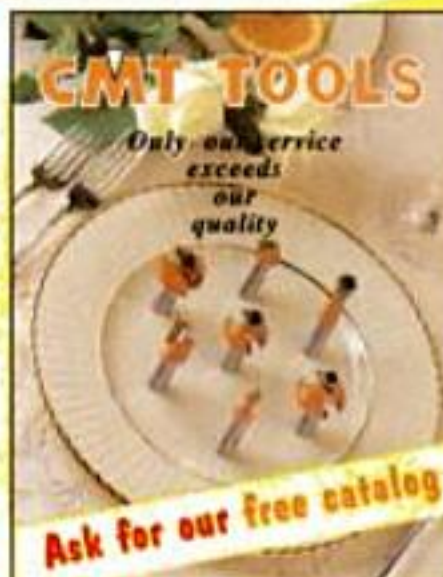
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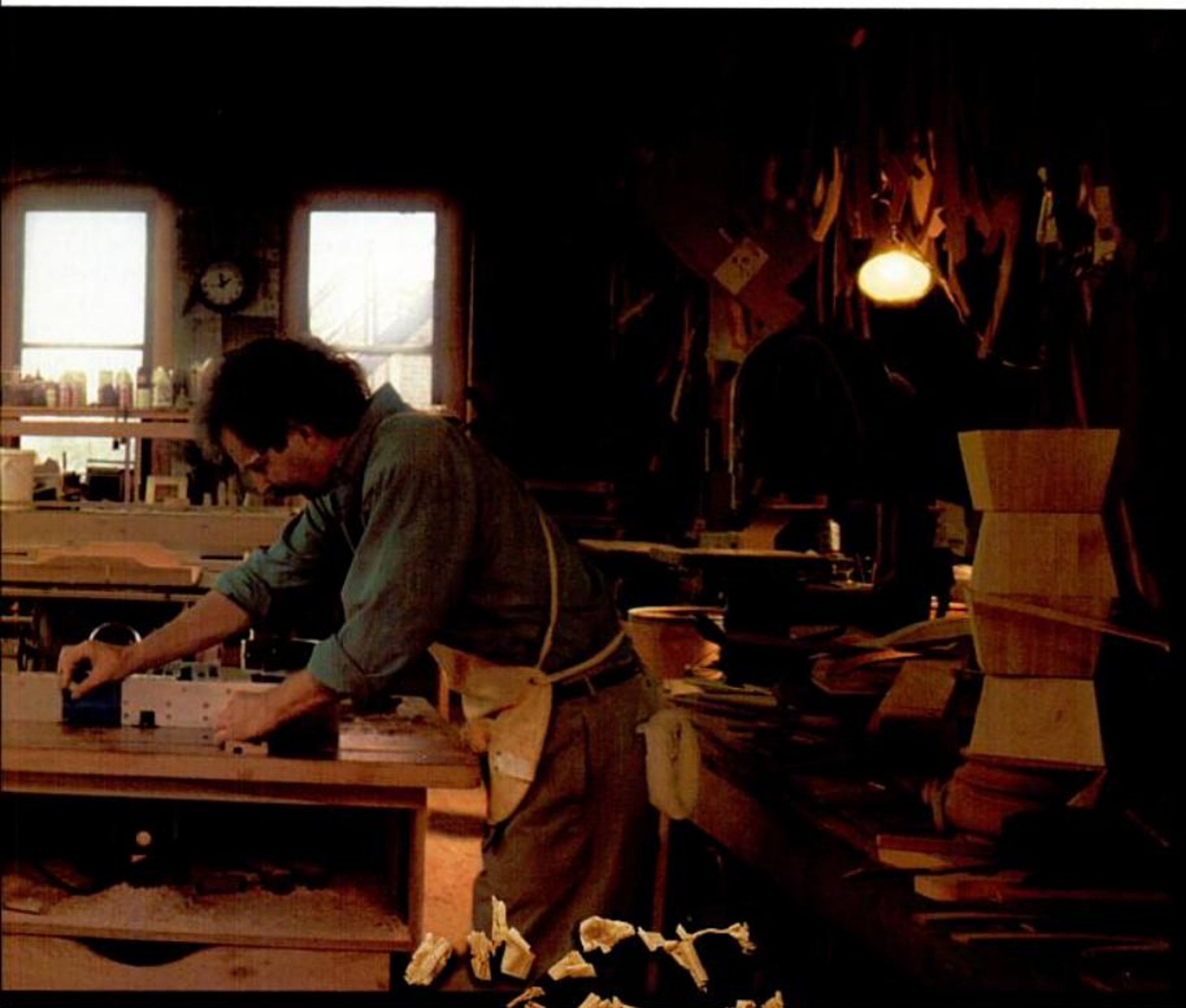


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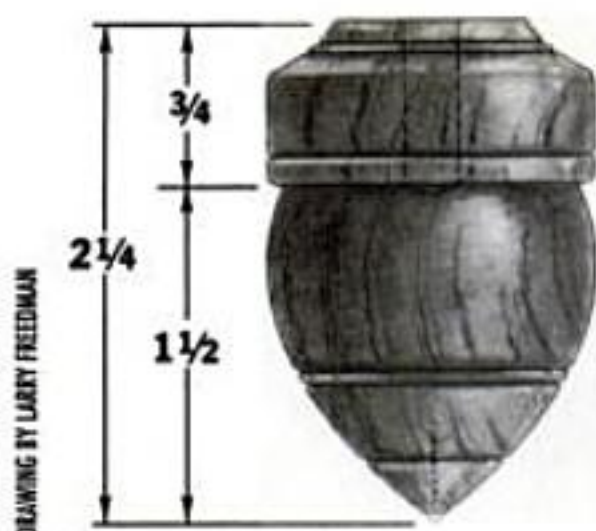


4CWZ-BH3-S105

LETTERS

Correction

The height dimensions for the turned top featured in AW #35 were incorrect. Here are the correct dimensions.



Tuning Tips Disputed

Re: "Tuning Japanese Planes" (AW #34). Toshio Odate mentions [that reducing] the surface area of the plane sole makes the plane easier to pull. He and authors of similar articles confuse the effect of contact area on friction. Any physics textbook will tell you that friction is independent of [contact] area.

If friction were truly dependent upon contact area, many woodworking operations would be difficult or impossible to accomplish. How could one slide a 4-ft. by 8-ft. sheet of 3/4-in. plywood over a saw table? The controlling factor [in planing] is downward force, which has to be applied to keep the plane blade cutting. If this downward force is changed, then the force required to pull the plane will change proportionately.

Jerry Glaser
Playa del Ray, CA

Toshio Odate says that to prepare a Japanese plane for trueing, one scrapes the sole concave so that the plane contacts a flat surface only at the very front, the very back and at the blade. From my experience (and common sense), a plane set up this way could only be expected to produce a

convex surface, with the curvature corresponding to the concavity of the sole.

Allan Boardman
Woodland Hills, CA

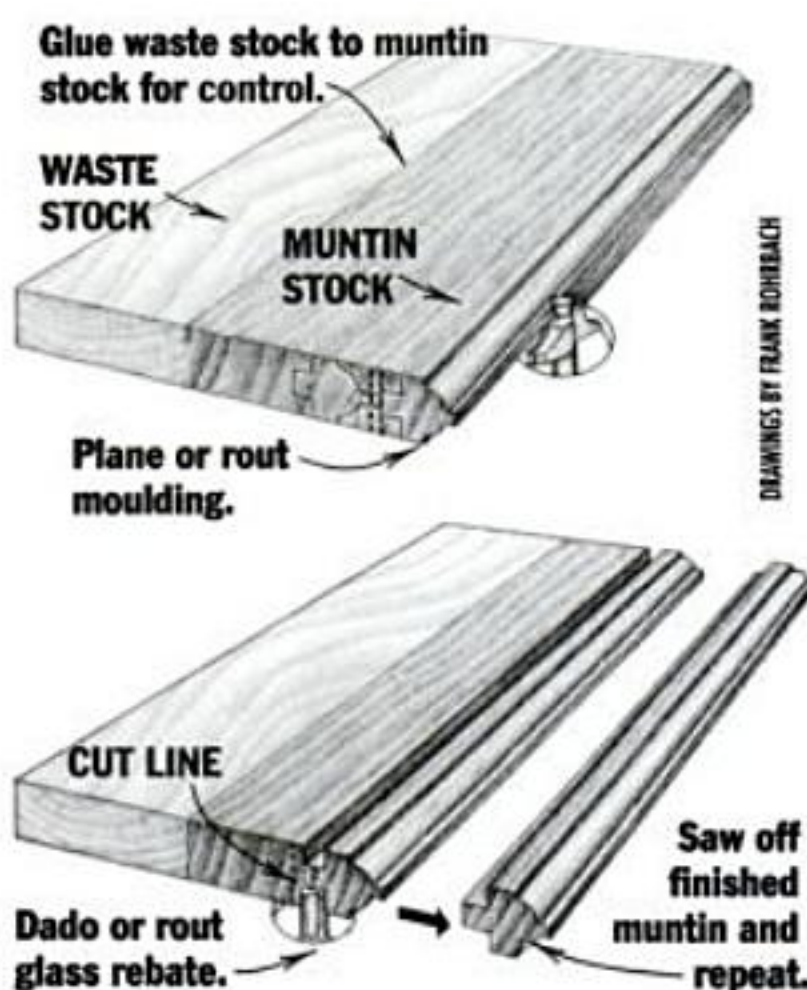
Toshio Odate replies: If you plane all day long, you will appreciate having less surface area in contact with the wood. Less contact area means you don't have to press as hard to get the blade to cut.

Also, it isn't the contour of the sole that determines whether a surface will be planed flat, but the way you use the plane. With practice you learn to vary downward pressure—less pressure at the beginning and end of the cut and more in the middle.

Molding Muntins

The method you described for molding muntins with a router and feather board ("Q&A," AW #31) is a solution but it can still be somewhat tedious. This is particularly true on small muntin cross sections that have very little flat left for tracking the final cut.

The method that I find most comfortable is to start with a wider



board, or if the material used is expensive, glue the muntin stock to a piece of scrap. (See drawing.) This gives you several inches to hold on to when cutting the last muntin.

Kenneth Folk
Harrisburg, PA

More on Moisture Meters

The article on moisture meters (AW #34) was very good, but I can't believe you neglected the Wagner L606 meter, which has no pins so it doesn't leave holes. The meter can be used to check moisture along the entire length of the lumber in seconds.

Eugene Wengert
Department of Forestry
University of Wisconsin

Information on the Wagner meter arrived too late to be included in our test. See this month's Tool Box column (page 86) for more on this meter.

Dual-Purpose Step Ladder

I like the "Dual-Purpose Roller Stand" (AW #35) but I don't have a lot of room in my shop so I use a "dual-purpose" step ladder. If the steps aren't the right height to support the work, I clamp a board [horizontally] to the outside edges of two legs.

R.W. Siemon
Port Saint Lucie, FL

An Inspiring Word

I clipped your word from the editor on "Making Do" (AW #35), framed it and hung it on my workshop wall, right where my tool rack is going to be...someday. You just may have realigned this paralyzed perfectionist's whole approach to woodworking. Thank you!

Warren Stottler
Vassalboro, ME

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LETTERS

Off the Mark

Re: "Black Marks on Oak" (AW #35). George Frank's advice to remove black stains on oak with oxalic acid is correct, but the oxalic acid should not be neutralized with vinegar. Vinegar is a very weak acetic acid solution, and this will do nothing to restore a normal pH to the wood. The best and easiest way to neutralize oxalic acid is with an alkaline solution. I use approximately 1 ounce of either borax or baking soda dissolved in a quart of distilled water.

[After treating the wood], I wash it down with distilled water to completely remove the oxalic acid crystals. If the crystals are allowed to remain in the surface or in trapped pores they will absorb moisture during humid weather, causing the finish to blush or "bloom."

Jeff Jewitt

Furniture conservator and restorer
North Royalton, OH

Oxalic acid is a highly toxic material and even small amounts ingested could cause severe gastrointestinal distress. Further, it is caustic to skin and could cause severe chemical burns, similar to sulfuric acid. Protective gloves and a particle mask should be worn when working with this material.

William R. Hollingshad
Bradfordwoods, PA

One ounce of oxalic acid per pint of water yields a 6 percent solution—more than strong enough for removing stains. Anything stronger will simply deposit more residue on the wood when it dries.

The easiest and quickest way to mix oxalic acid is to stir the crystals into warm water. They'll dissolve almost immediately, so you can use the mixture as soon as it is cool enough to handle comfortably.

Michael Dresdner
Easton, PA

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AW is looking for a full-time editor with excellent journalistic skills and a strong knowledge of woodworking. Must be willing to relocate. Send resume to:

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Unsafe Sawing

Re: "Quiet Blades" (AW #34). I am appalled that you would publish a picture that shows no regard for proper personal safety procedures. Where is the guard on the saw? How about eye protection for the operator? Additionally, don't safety guidelines call for removal of watches and

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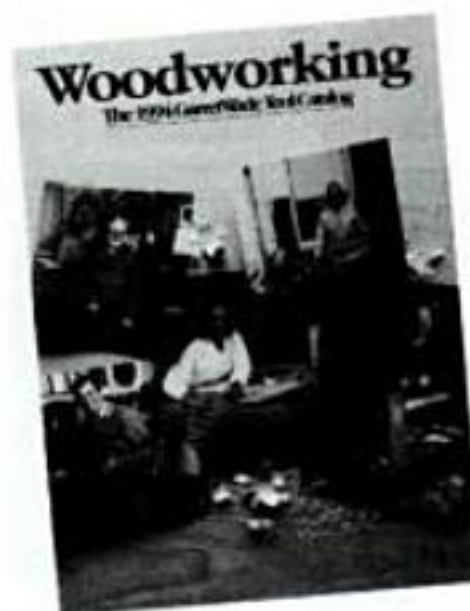
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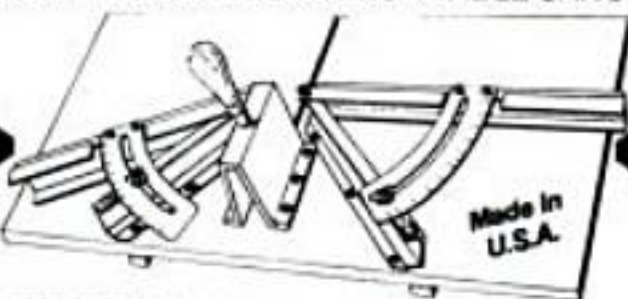
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LETTERS

jewelry? To read a safety-related article that includes such a picture is truly sad.

Charles Sheaff
Keene, NH

In the photo in question we were measuring the noise level of a blade, and a guard would have interfered with our readings. But you're quite right about the other procedures. It was simply an oversight on our part.

Deconstructing Decibels

Re: "Quiet Blades" (AW #34). The article states that "decreasing loudness by 3 dB cuts the sound intensity in half." This is essentially inaccurate. Loudness does not linearly correlate to sound intensity. A 3-dB difference equates to a reduction of acoustic

energy by half; however, it is generally regarded that a 10-dB difference in energy levels is required in order to be sensed as a reduction in loudness by half.

Having been led to believe these blades offer dramatic improvements over conventional blades, users may tend to think their particular blades are defective [if their ears don't discern such a difference].

Mark Bailey
Piedmont, CA

You're right. The 3-dB reduction in sound intensity does not halve the loudness of the sound you hear. But "loudness," like "sweetness" or "beauty", is a subjective term that doesn't precisely indicate how harmful a sound is. In the final analysis, reducing sound intensity

by 3 dB cuts the power of the sound in half and that significantly reduces harm to your ears.

Fine Figure

I truly enjoyed Monroe Robinson's article on "Wood Figure in Design" (AW #32). The subject is seldom discussed in woodworking books and magazines, but it is most important in achieving your best results.

Jose A. Mari Mutt
Mayaguez, Puerto Rico

What's on your mind? We value your comments, complaints and corrections. Send your letters to: "Editor," AMERICAN WOODWORKER, 33 E. Minor St., Emmaus, PA 18098, or telephone your message to us at 215-967-7776. FAX: (215) 967-8956.



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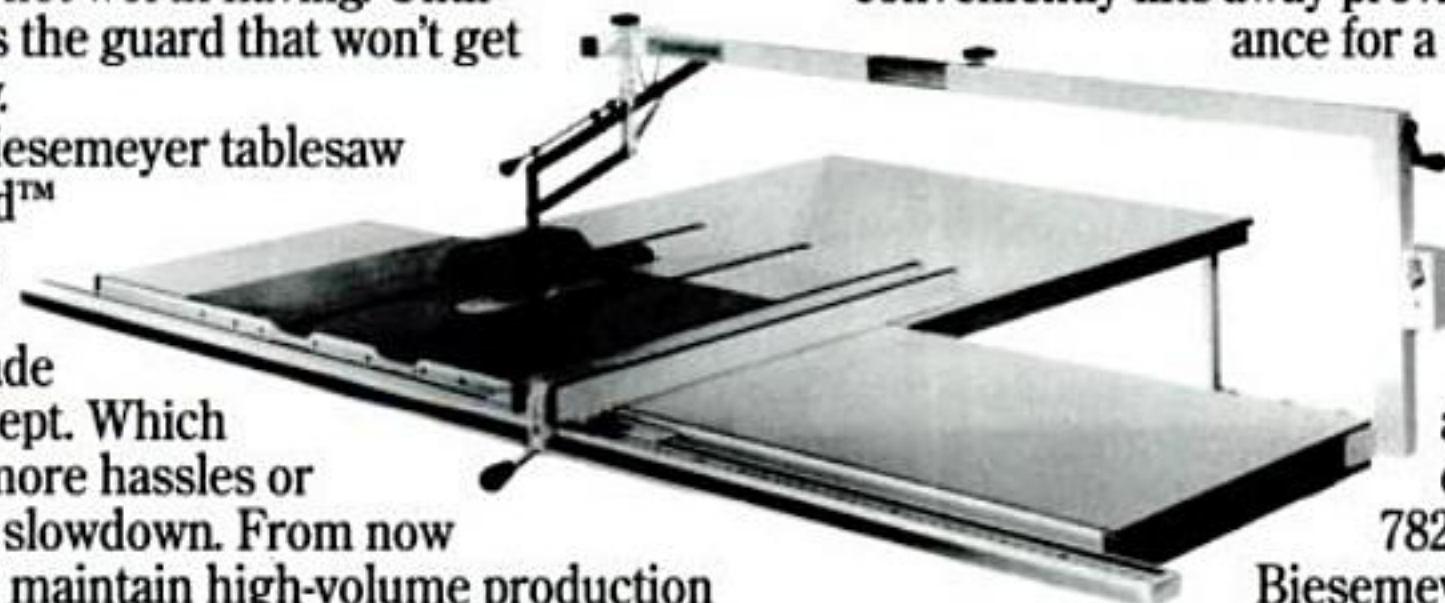
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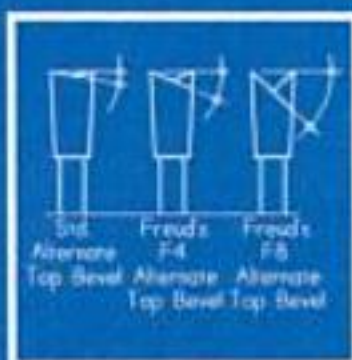
You can't, because these new blades are absolutely quiet and vibration-free. All other blades vibrate. If you don't believe us, take the blade you're currently using, hold it by the arbor and tap it with a pen or pencil. Hear the ringing noise? That's the vibration, the same thing that happens when you make a cut. Now, tap the blade on this page. No really — try it! That's what our new blade sounds like.

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Sticking Router Bits

Q Every time I use my plunge router, the bit sticks so tightly in the collet that I have to tap it out with a piece of wood and risk shattering the carbide tips. What can I do to keep the bit from sticking?

Gurnee Barrett
Greenville, TN

A Often router bits stick because pitch and wood resins have built up inside the collet. Cleaning the collet with 0000 steel wool and oven cleaner should help reduce sticking. While it's a good idea to place a drop of oil on the *outside* of the collet to keep it from sticking, don't oil the *inside* of the collet, or you risk the bit loosening during routing.

A bit will also stick if it has a galled or scored shaft. To remedy this problem, remove any high spots with a mill file.

If these steps don't solve your problem, you can usually use one of the following methods to remove a bit without damaging the carbide: If the head of the bit is larger than the shank, cut a "V" in a thin piece of scrapwood and use this "fork" to lever between the nut and the top of the cutter's flute. If this doesn't loosen the bit, or the head of the bit isn't big enough to apply a lever, clamp the cutter in a wooden-jawed vise and turn the router shaft with a wrench until the bit loosens. (On routers with shaft locks, simply engage the lock and rotate the router.) Finally, if you lightly tap the collet nut or the shank of the bit where it exits the collet, you can usually loosen the bit without harming it.

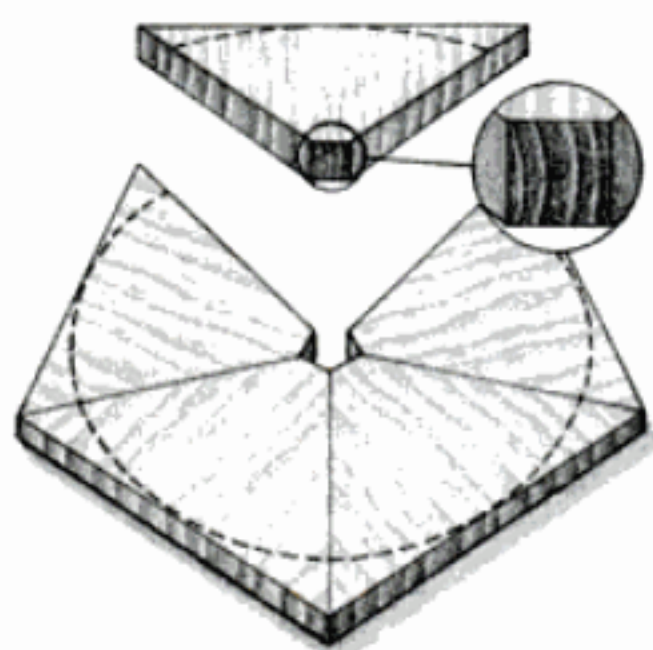
Pat Warner
Furniture maker
Escondido, CA

Wooden Gears

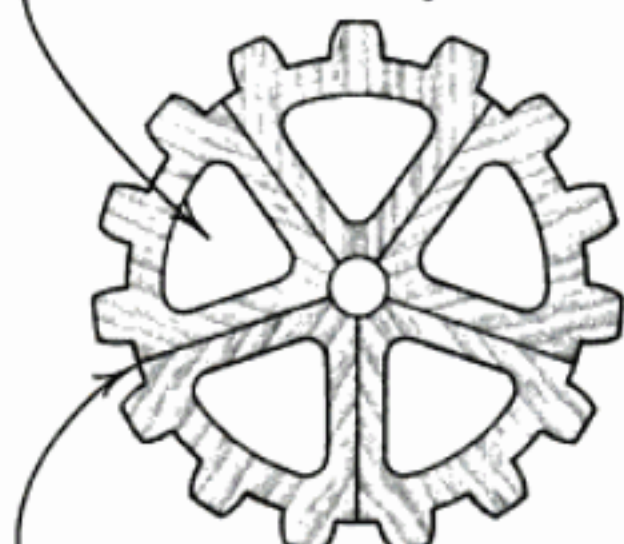
Q I've been making wooden gears by laminating three or four thin pieces of stock together, orienting each layer at right angles. Is this

MAKING WOODEN GEARS

Glue blank from pie-shaped segments of quartersawn stock.



Cut away wood in center of wedges to reduce stress caused by wood movement.



Glue line falls between teeth when number of segments is divisible into number of teeth.

DRAWINGS BY FRANK ROHRBAUGH

a good idea, and if I wanted to use just one piece of wood, what would be the best type to use?

Wayne French
Baltimore, MD

A I advise against laminating stock to make a gear. Laminated teeth will have a surface composed of long grain and end grain (like the edge of a plywood board), and the teeth will wear unevenly as a result. Instead, I recommend using a single piece of wood if the gear will be small (1½ in. dia. or less), or better yet, gluing pie-shaped segments together. (See drawing.)

If you're making the gear from a single piece of wood, use a species that doesn't move much with changes in humidity and one that has adequate strength for those teeth that will have short grain running across them. My first

choice would be black cherry, which is a fairly dimensionally stable wood. However, for strength it's necessary to find slow-grown material with closely spaced growth rings, about 10 to 12 rings per in. minimum. Other woods from which I have successfully cut gears are apple and pecan.

To make the gear from a glued-up blank, use quartersawn stock and rout away material in the center of each segment to reduce wood movement. (See drawing.) Use at least five pie-shaped segments to make the blank so that the joints are as close to long grain as possible. Also, the teeth will be stronger if the glue lines fall *between* the teeth rather than *on* them. The easiest way to ensure this is to count the number of teeth on the gear and make the gear from some number of segments that can be evenly divided into that number of teeth (five segments for a 15-tooth gear, six segments for an 18-tooth gear, etc.).

Ray Levy
Wooden machinery maker
Soquel, CA

Trimming Veneer

Q What is the best way to trim away excess veneer that overhangs a surface?

Bob Schmidt
Anchorage, AK

A You can hand-trim veneer by using a sharp knife at the point where the veneer overhangs the edge. Make repeated cuts until the overhang is separated, then sand the edge. The knife insures a splinter-free cut but the technique is, unfortunately, pretty slow going.

A faster method is to use a router and a laminate-trimming bit. This is usually trouble-free if you follow a few rules. First, use a new or freshly sharpened cutter, and pick one with the shortest of flutes. Keep the overhang to less than ⅛ in. when laying the veneer, and "climb-cut" (run the router from

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right to left as you face the work) to prevent any tear-out.

One way to get an even $\frac{1}{8}$ -in. overhang is to first trim the veneer with a router, using a bearing that's $\frac{1}{4}$ in. larger than the diameter of your cutter. Then replace the bearing with one that's the same diameter as the cutter for the final cut. After trimming, a light sanding will remove any whiskers left by the bit.

Pat Warner
Furniture maker
Escondido, CA

Mortise and Tenon Flawed?

Q Why don't glued mortise-and-tenon joints loosen, since they juxtapose side grain at 90°?

Alex Ettl
Chattanooga, TN

A Well-fit mortise and tenon joints are so structurally strong that it doesn't take much to lock them together. (A dry-assembled joint will hold indefinitely with just a single peg through the tenon.) Therefore, when you glue this joint, only a portion of the glue bond has to survive to be effective. As the wood moves in different directions, the wood fibers are likely to tear before the glue fails. But this occurs near the edges and end of the tenon. The center of the tenon stays glued so the joint remains tight.

Peter Korn
Furniture maker and teacher
Rockland, ME

Water Stone Suction

Q When sharpening tools on some of my Japanese water

stones, there's an incredible amount of suction between the tool and the stone, particularly when flattening the back of a wide tool like a plane iron. Is there some way to overcome this resistance?

Simon Cronley
Ealy, SD

A Suction occurs when a wet paste of stone and steel is created during sharpening. The water in the paste is sucked into the stone, and the dry paste glazes the stone's surface. This happens more in man-made waterstones because they're more porous than natural stones.

To overcome the suction, you need to keep the pores of the stones clean. First, submerge man-made stones in water for about 20 minutes before you use them to fill the pores with water. (Natural stones don't need soaking.)

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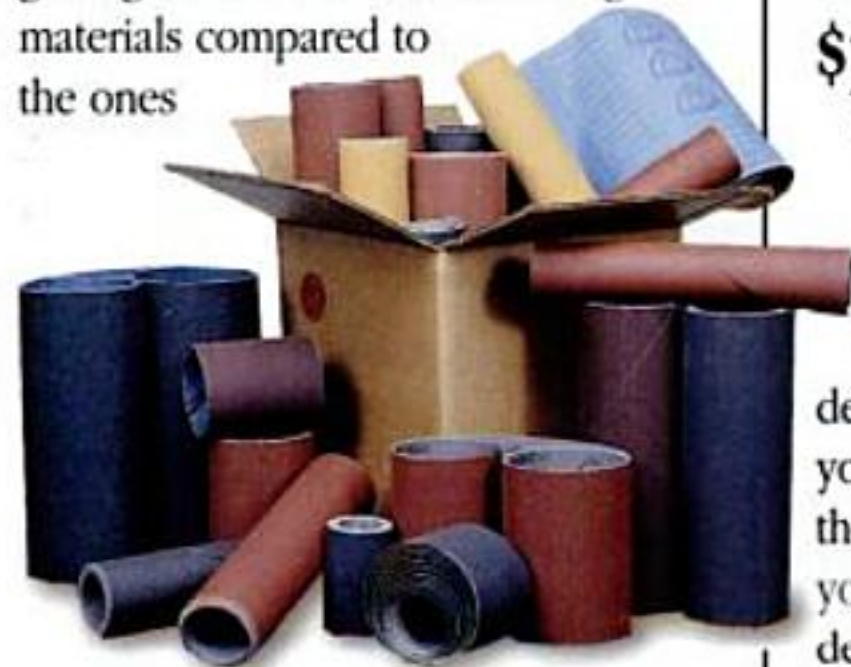
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Q&A

Then, as you sharpen initially, keep the stone well washed with water to prevent paste buildup.

On the final strokes, when you're ready to move to the higher-grit stone, reduce pressure, and allow the paste to remain on the stone. This will make the scratches on the tool shallower, and makes for less work as you hone on the finer-grit stone.

Toshio Odate
Author, sculptor and shoji maker
Woodbury, CT

Discolored Pine

Q Much of the pine available in my area has black and gray streaks. Is it possible to bleach the wood to make the color uniform?

Joe Aymond
Port Barry, LA

A The staining and streaking in question is the result of a staining fungus that grows only in the sapwood—especially during warm weather—and causes a stain that varies from

smoky gray to blue-black. The stain penetrates throughout the sapwood, so bleaching is ineffective, and you can't plane it out either. To get unstained pine you must work only with the heartwood or find lumber that has been cut, sawn and dried in the wintertime.

Chemical treatment to discourage fungal growth is being phased out for environmental reasons, and discolored pine is becoming more common. Personally, I find the patterns of grain interesting, particularly at the junction of heart- and sapwood.

Jim Sunderland
Sawyer
Nova Scotia, Canada

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Call for quantity discounts. Other sizes and grades available.

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	\$53.00

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	*DW 431 3x21 VS Belt Sander	\$181.95
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	*DW 615 1 1/4" H.P. VS Plunge Router	\$157.95
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A well-tapered plug will always
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leaving no gap.

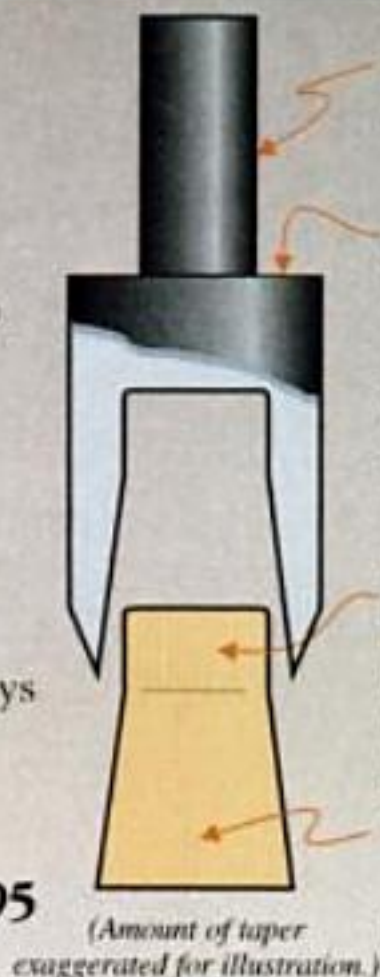
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Snug-Plug® Cutters
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They are then taper-reamed
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easy and straight entry into
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The plug is then tapered to
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tight fit.

(Amount of taper
exaggerated for illustration.)



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CIRCLE NO. 19 ON PRODUCT INFORMATION FORM

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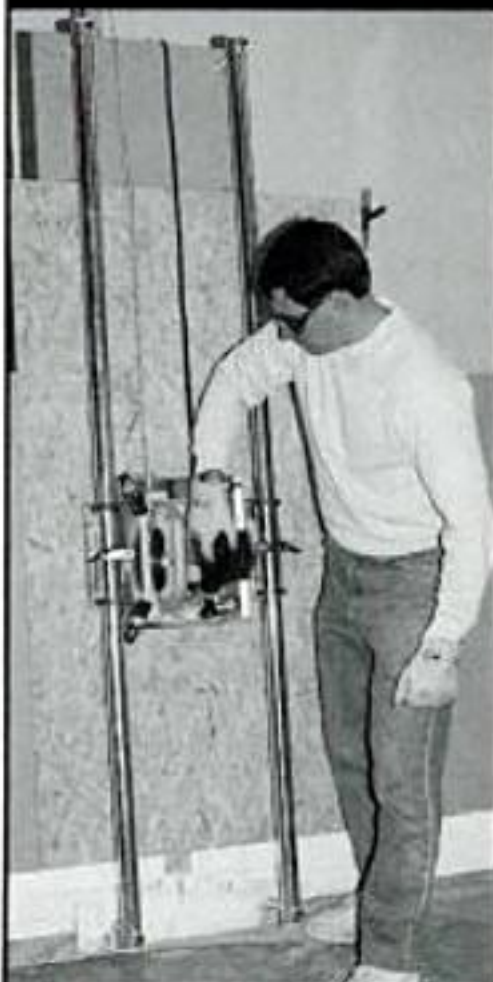
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Panel kits do not include backing or fence.



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CIRCLE NO. 24 ON PRODUCT INFORMATION FORM

MLCS, Ltd.

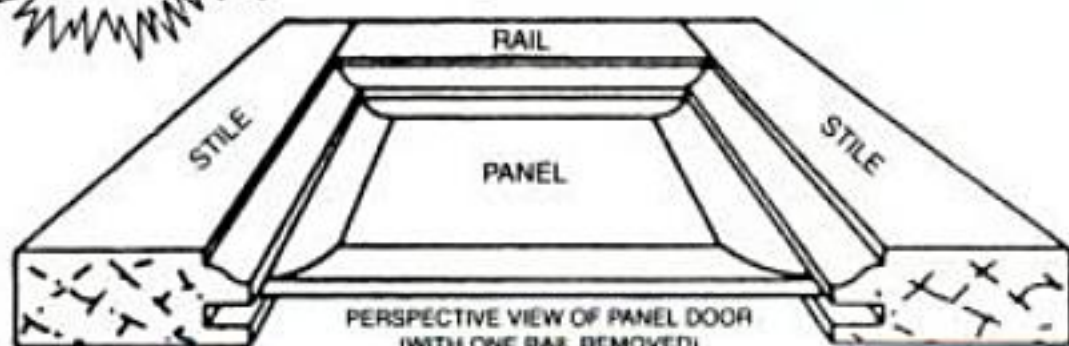
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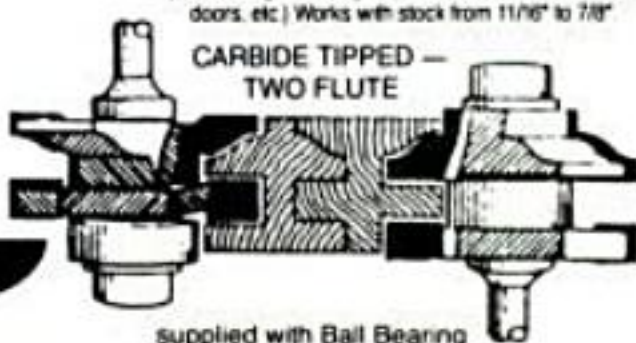
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Positioning jigs can be great for drilling holes or cutting straight slots; but remember, it is impractical and unsafe to move large, heavy workpieces over a router table to cut dovetails. Only the Leigh Dovetail Jig lets you cut true, accurate through and half blind dovetails on workpieces up to 1 1/2" thick and 24" wide, with *no* hand chiseling or joint-weakening gaps. And you finish your piece with one easy set-up, rather than the endless positioning movements needed with some other jigs (as a craftsman, you know that every extra set-up is just another chance to slip up—and ruin your workpiece). With the Leigh jig you make multiple joints on one set-up, not multiple set-ups for one joint.

Don't waste time, energy, and wood on a jig that can't do the job. For your free Leigh Industries catalog of jigs, cutters, and attachments, use the reader service number or call our toll-free number.



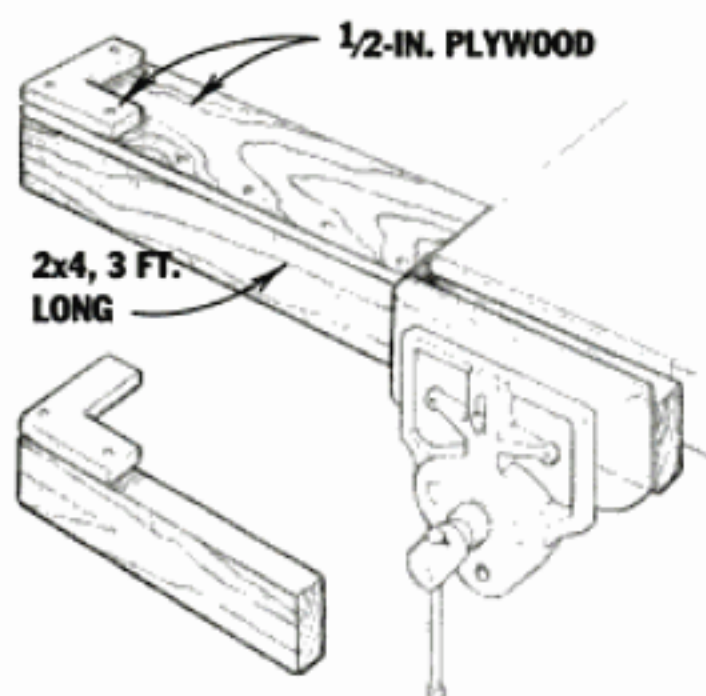
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CIRCLE NO. 10 ON PRODUCT INFORMATION FORM

TECH TIPS



Benchtop Extension

When I needed to plane some extra-long stock, I improvised a 2-ft. extension for my benchtop as shown. It projects far enough that I can clamp the work between the stop on the end of the extension and the dog in the tail vise at the other end of the bench. I've also made some shorter extensions by nailing a plywood 'L' to a scrap piece of 2x4.

Carl Dorsch
Pittsburgh, PA

volume of air to near zero. When it's all over, rinse the marbles in thinner and start over.

Doug Kenney
South Dennis, MA

Chopstick Brushes

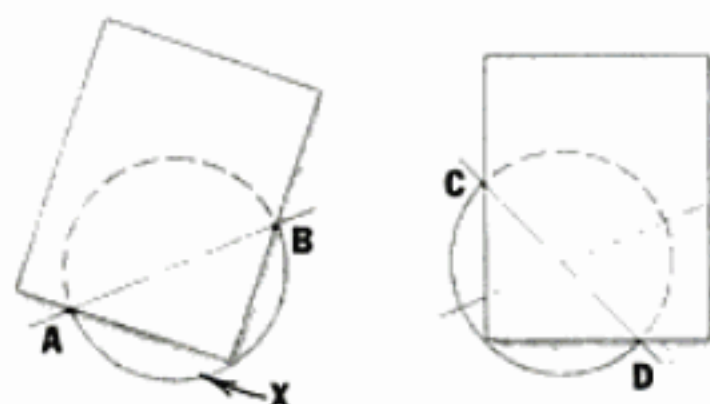
I recently needed a long, narrow yet stiff brush. Nothing seemed to work until I thought of Chinese chopsticks, the bamboo kind, of course, not plastic. I gently beat the pointed end with a hammer until the fibers were well separated and I had a fine-bristle brush.

I've found these makeshift brushes work well wherever you need a glue applicator, paintbrush or crevice-cleaning tool. For a fresh brush, just cut off the old tip and beat yourself a new one. When you run out of chopsticks, take mother out for Chinese. She'll love you for it, and you'll net a free shop tool.

Bud Morang
Riceville, TN

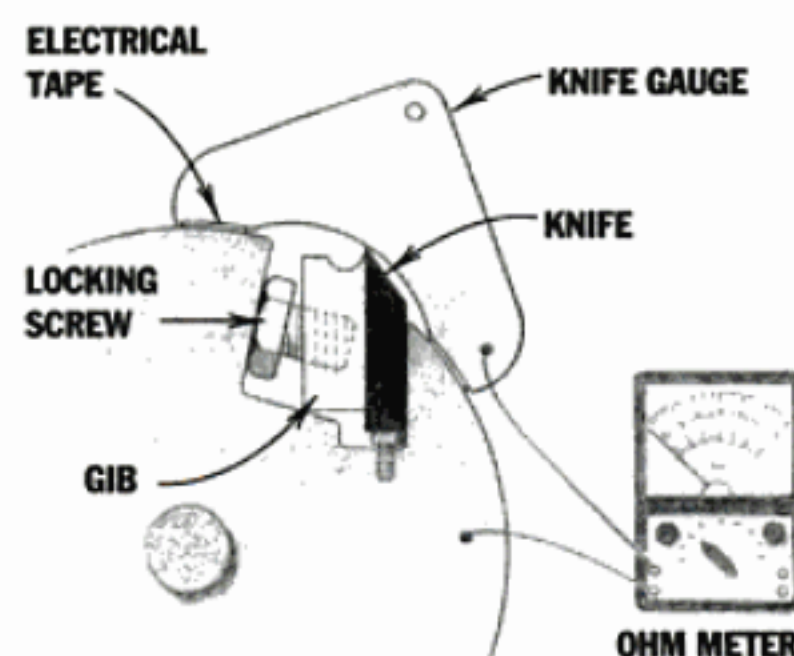
Seeking Circle Centers

To find the center of a circle, position a postcard or sheet of paper so one corner touches the circumference (X in the drawing). Mark the points where the circle crosses the edges of the sheet (A and B in the drawing) and join the points with a straight line. Pick another section of the circle and repeat the process (C and D in drawing). The intersection of the



two lines always gives the exact center of the circle.

Wesley Leinbach
Myerstown, PA

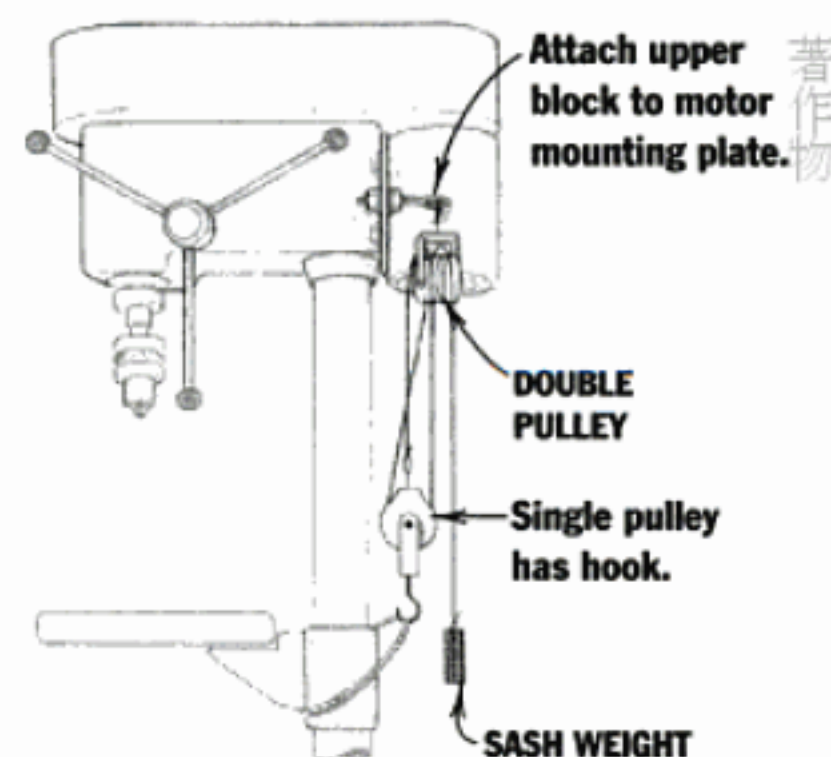


A Good Connection

When setting a new knife in a planer or jointer, it's hard to determine the exact point at which the edge of the knife first touches the gauge. My solution is a simple one: Insulate the ends of the gauge with electrical tape and then hook an ohm meter to the gauge and planer as shown. Set the blade in place and slowly raise it until you make contact.

If you don't have an ohm meter, a flashlight battery wired to a bulb is equally effective.

C.E. Rannefeld
Decatur, AL



Taming the Drill Press

I've never had any trouble lowering the table on my drill press, but I'm going on 80 now and raising it without a crank is getting harder. My solution is to attach a simple tackle to the collar as shown. To raise the table, I slack the clamp and pull down on the line. The iron sash weight keeps tension in the line and also acts as a counterbalance. You can get the pulleys and $\frac{1}{16}$ -in. nylon line at your local hardware store.

Oscar Williams
Lincoln, NE

Wandering Push Stick

After misplacing my tablesaw push stick a dozen times, I finally came up with a solution: I drilled a shallow hole in the handle and epoxied in a small, round magnet. Now the push stick "sticks" to the front of my tablesaw, so it's always there when needed.

David Dreher
Allentown, PA

Using Your Marbles

A thirsty crow, unable to reach the level of water in a pitcher, dropped pebbles into the jar until the water rose to the brim. Similarly, to prevent varnish (or paint) from oxidizing and forming a skin, drop marbles into the can. The level will rise, reducing the

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W/2 Batteries
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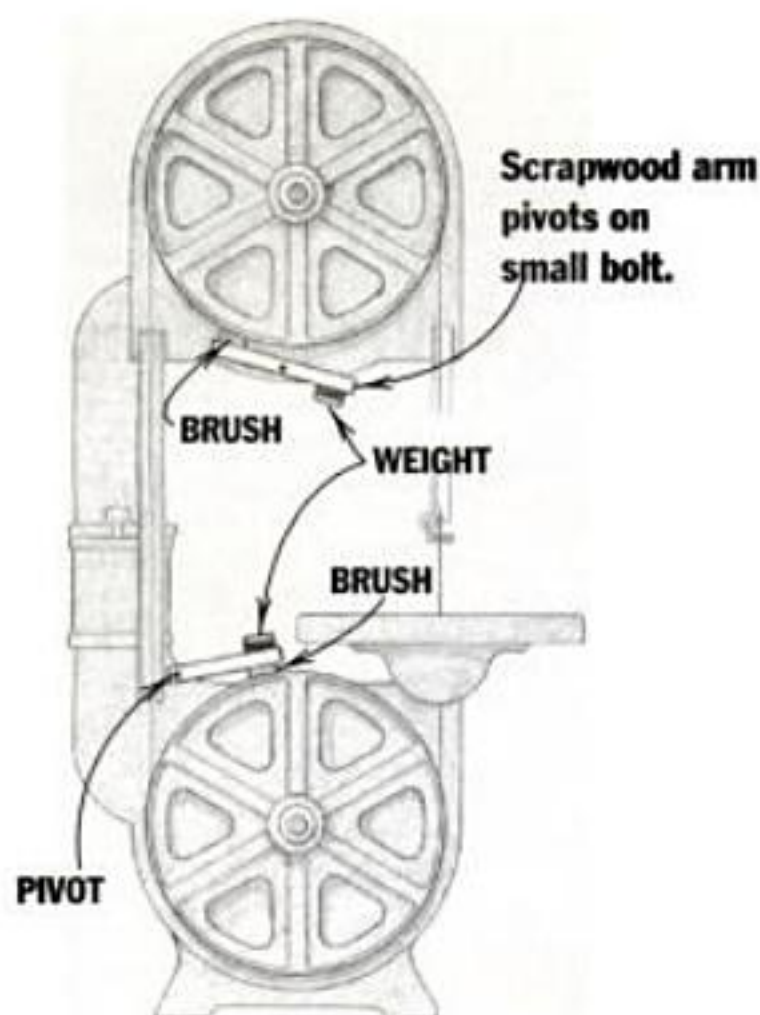
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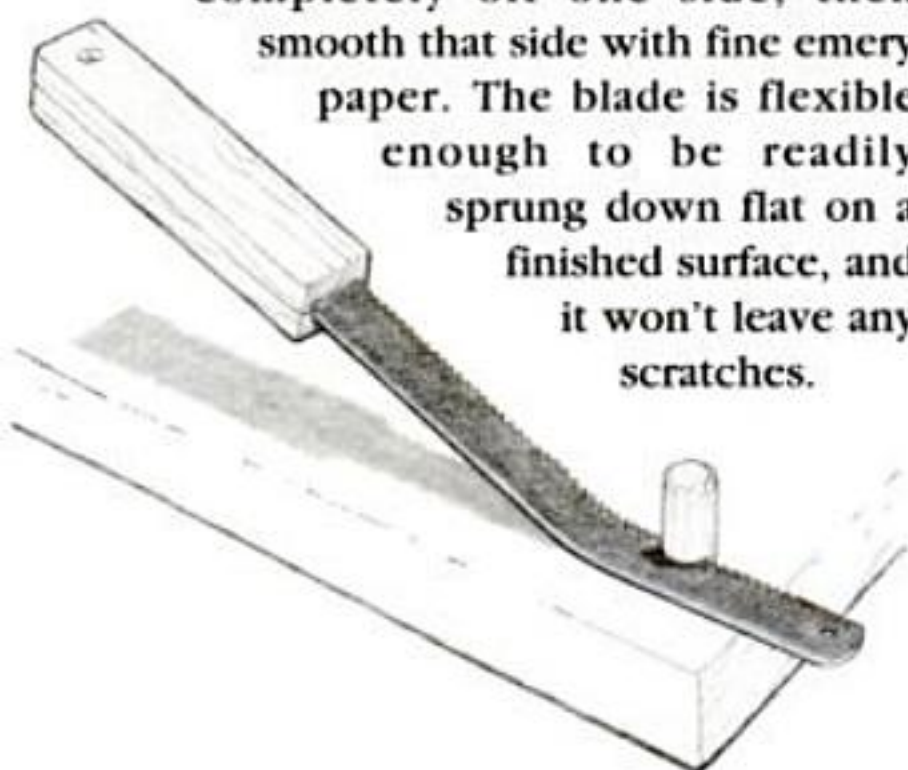
Bronze Brushes Revisited

I like Donald Kinnaman's bronze brush idea ("Tech Tips," AW #32), but I've found the brushes more effective when mounted on an arm that is free to move. This takes care of the brush wearing down as well as any unevenness in the wheel. A torsion or tension spring could be substituted for the weights.

Richard Quance
Almonte, Ontario

Low-tech Trim Saw

I have a way to cut plugs flush with a finished surface that doesn't need a router ("Tech Tips," AW #34). I take a new hacksaw blade—the flat type with no ripples—grind the teeth completely off one side, then smooth that side with fine emery paper. The blade is flexible enough to be readily sprung down flat on a finished surface, and it won't leave any scratches.



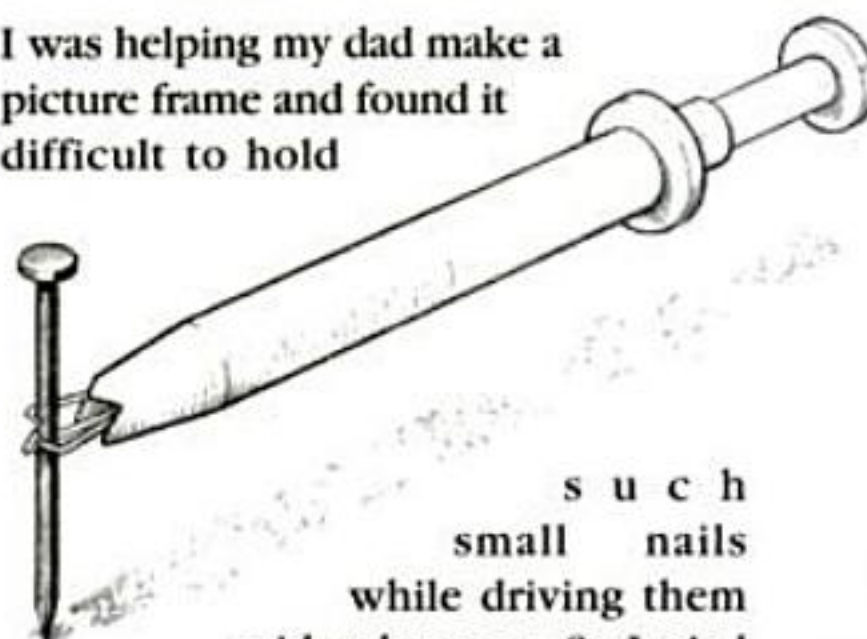
You can make the blade cut on the push stroke or the pull—whichever you prefer—by attaching the wooden handle at one end or the other.

Paul Payne
Vero Beach, FL

TECH TIPS

Three-Claw Retriever

I was helping my dad make a picture frame and found it difficult to hold

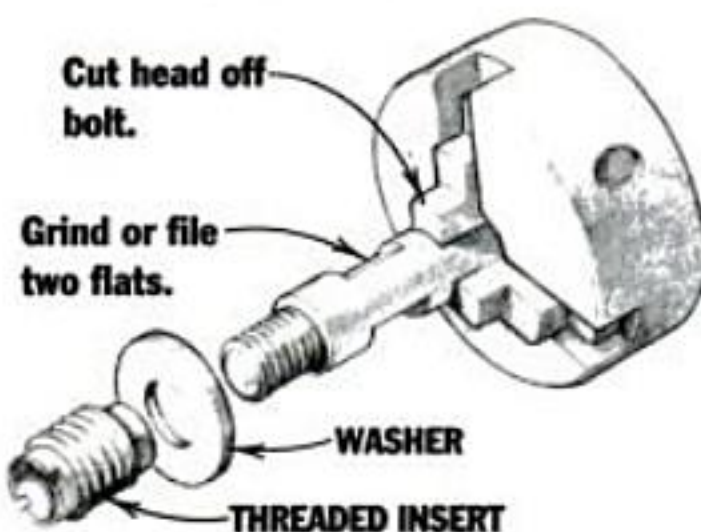


such small nails while driving them with a hammer. So I tried holding the nails with a three-claw part retriever, like the ones sold at computer supply stores. It was the perfect tool.

Mathew McDougal
Findlay, OH

Make Your Own Screw-Drive Center

This lathe drive center transmits torque much better than the usual



type of coarse wood screw. To make one, find an old lawn-mower axle bolt and file two flats so you can slip a wrench on it.

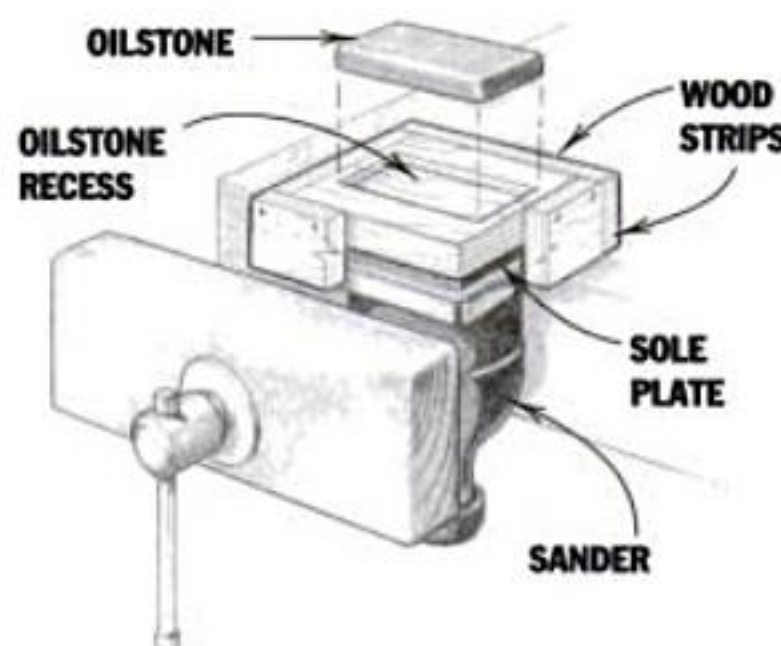
Put a washer over the end of the bolt, coat the threads with epoxy and screw on a $\frac{3}{8}$ -in. threaded insert. Then drill a $\frac{1}{2}$ -in.-deep hole in the center of your turning blank and screw the threaded insert into it. Put the shank of the bolt in your lathe chuck and you're in business.

Lyle Terrell
New Orleans, LA

Steaming Along

The next time you want to bend solid wood edging around a curve, try coaxing it with a steam iron. The combination of heat and moisture is very effective. Steam irons are also useful when removing dents and bruises from finished surfaces. Lay a damp cloth over the wood, set the control to "linen" and iron away. The compressed fibers will soften, swell and return to the original surface. A light sanding will complete the job.

Cary Lowrance
Orland Hills, IL



Orbital Honing

During my 50 years of woodworking I've found a simple, easy method to hone edges that you won't find in any textbook. First, I make a plywood plate to fit snugly over the pad of my orbital palm sander and cut a recess in the plywood to fit a small oilstone. Then I clamp the sander upside down in a vise with padded jaws, put in a stone and turn the sander on. The sander helps move the tool around so the stone wears evenly, and it's amazing how quickly and uniformly it hones a surface.

Milton Tucker
Salina, KS

Know a better way of doing something? Designed a clever jig? Send your woodworking tips, along with a sketch or a snapshot to: "Tech Tips," AMERICAN WOODWORKER, 33 E. Minor St., Emmaus, PA 18098. We'll pay you \$50 if we publish your tip.

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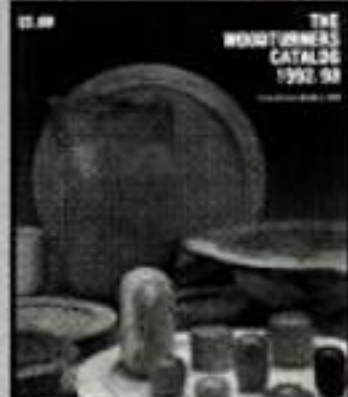
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*This Small Cabinet
With a Secret Drawer
Is a Faithful Reproduction
of a 200-year-old Original*

BY CRAIG W. BENTZLEY

The Pennsylvania spice box is a wonderful example of regional furniture development. Originally intended for storing spices—which were so rare they had to be kept under lock and key in Colonial days—these miniature cabinets were made and used in many parts of the country. But nowhere did the style evolve or persevere as it did in the Delaware Valley area of southeastern Pennsylvania, particularly Chester County.

Pennsylvania-style spice boxes began with William & Mary examples around 1680, evolved throughout the Queen Anne and Chippendale periods, and continued to about 1800, when some boxes exhibited Hepplewhite features.

Spice boxes were commonly constructed from local hardwoods and often concealed secret drawers that were accessed in ingenious ways. The spice box shown here is based upon an original from the collection of the Chester County Historical Society in West Chester, Pennsylvania.

Notes on Construction

Though I strive for accuracy when building period reproductions, I decided to make some changes after inspecting the original box. The door on the original had split in the center because the maker hadn't allowed for wood movement, so I redesigned the door's breadboard ends. (See Fig. 4.) I also changed the access to the secret draw-

PENNSYLVANIA SPICE BOX

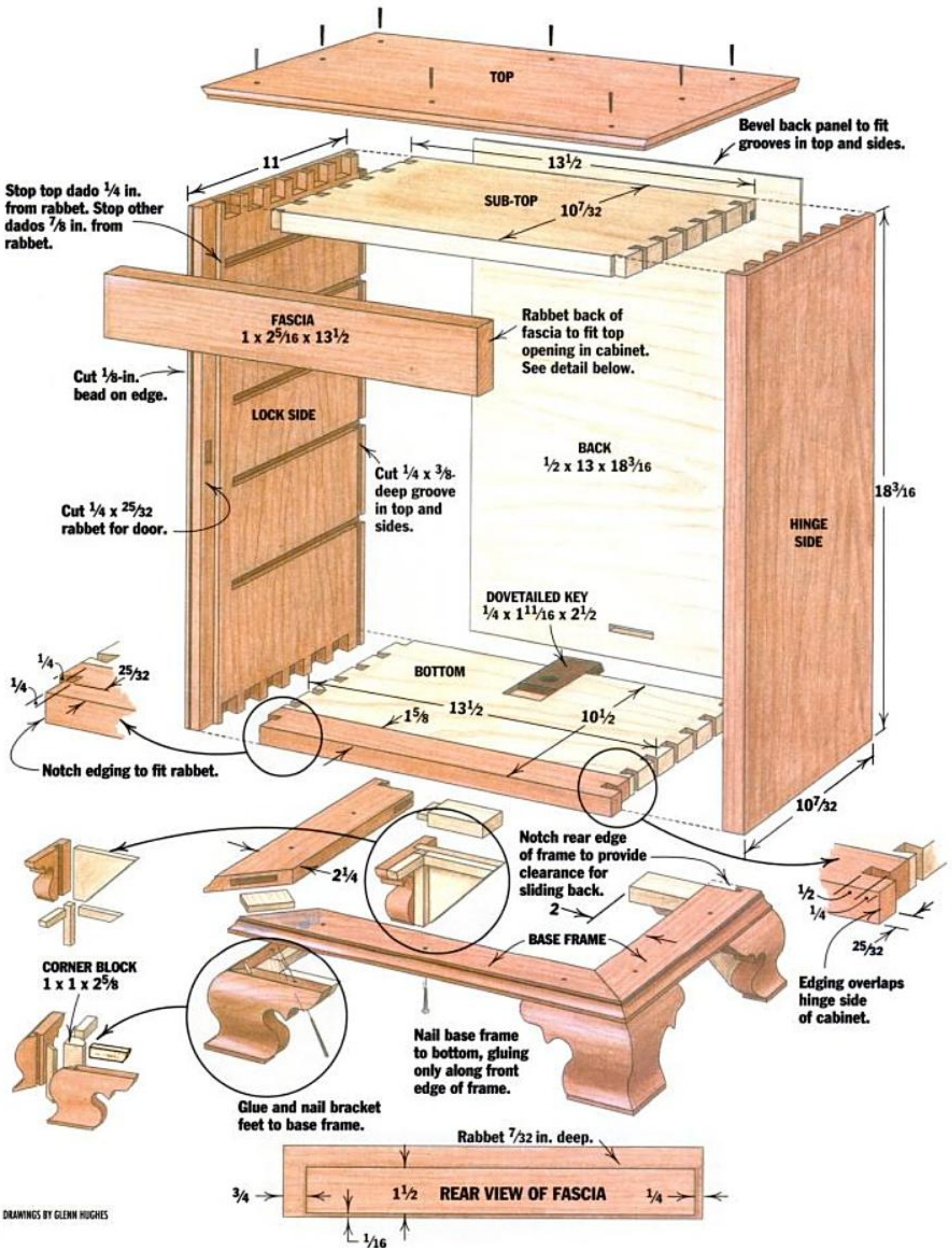


Spice boxes were known for their personalized detail, including inlays and ingenious secret compartments. This miniature cabinet conceals a secret drawer.

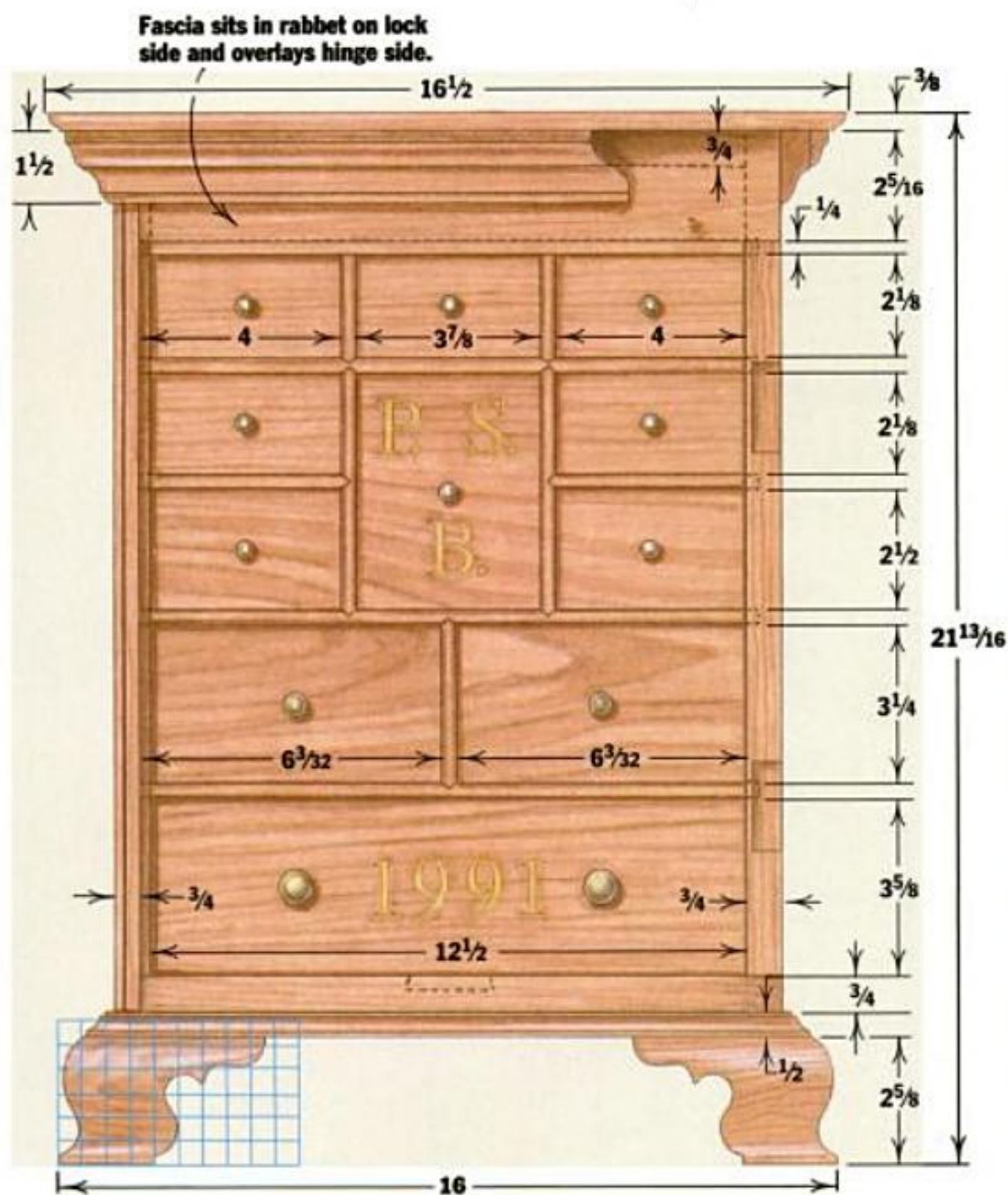
er at the top of the cabinet. To get to the drawer on the original, you have to remove the back of the box by sliding it up a groove through the cabinet's top. On my version, the back fits

in a groove that's stopped in the cabinet top, and you slide the back down just enough to expose the drawer. (See Fig. 3.) This design makes it impossible to detect the drawer from above.

FIG. 1: SPICE BOX

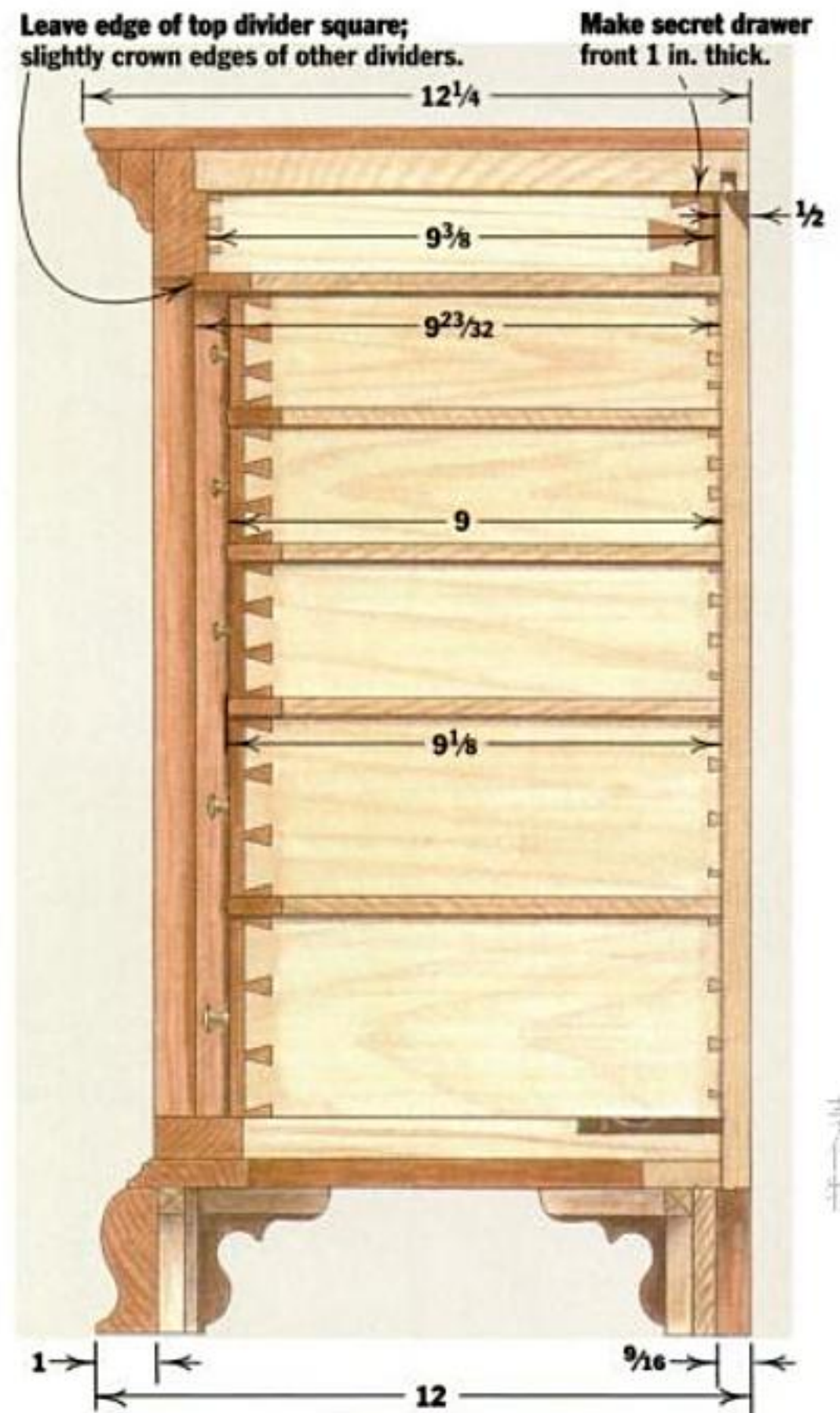


**FIG. 2: FRONT & SIDE ELEVATIONS
(DOOR REMOVED)**



1 SQUARE = 1/2 IN.

NOTE: All dividers 5/16 in. thick.
FRONT ELEVATION



SIDE ELEVATION / SECTION

Building this box is a good exercise in 18th-century cabinet construction. The carcass and drawers are dovetailed together, while the dividers are joined by shallow dadoes. The box sits on a base frame with ogee bracket feet. And the door overhangs the hinge side of the cabinet but is inset on the lock side, a design feature typical of this genre.

I used 16-in.-wide cherry boards for the primary wood, choosing carefully for grain and color. The 16-in. width made it possible to fashion all the drawer fronts from one board for a unified appearance. The secondary wood is yellow poplar, and I used walnut for the secret drawer front and the sliding dovetailed key that engages the sliding back. (See Fig. 3.)

One final note: It's important to follow the order of construction detailed here, since many steps depend on what precedes them.



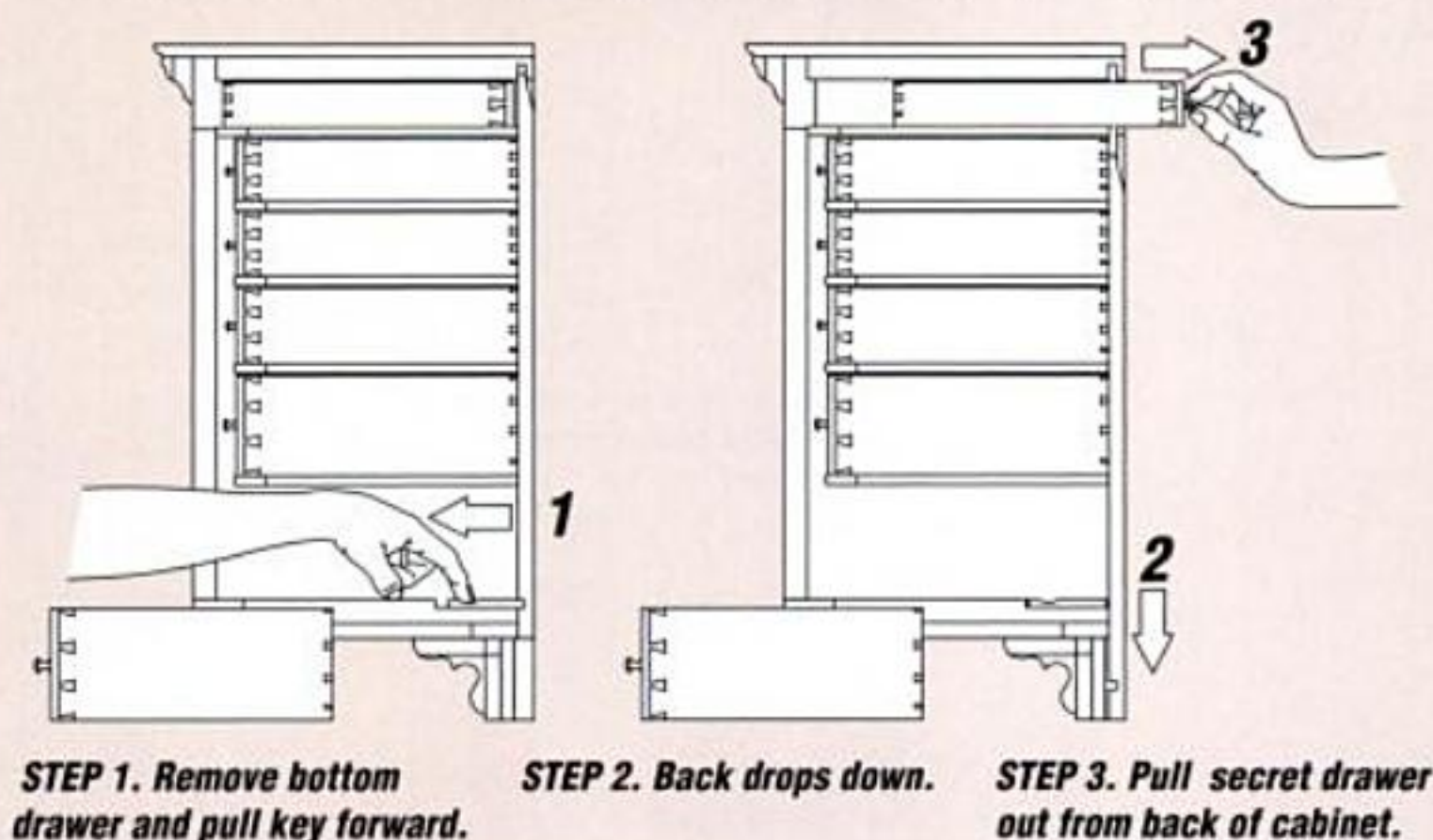
Author marks end of divider by placing it into the dado and using an awl to scribe the cut.

Making the Carcase

I began construction with the carcass, which has sides, sub-top and bottom joined by half-blind dovetails. First I glued a strip of cherry to the poplar bottom and notched the edging as shown in the detail in Fig. 1. Then I cut the rabbet in the cabinet's lock side and grooved the sub-top and sides to accommodate the back. I cut the dovetails next, then routed the stopped dadoes for the dividers.

I used a scratch stock to cut the decorative bead that runs along the edge of the lock side. (For more on scratch stocks, see AW #22 and #32.) Then I cut the dovetailed recess in the bottom for the sliding key that holds up the back. (See Fig. 1.) After that, I glued the case together.

FIG. 3: HOW THE SECRET DRAWER WORKS



Cabinet (with back removed) shows secret drawer and dove-tailed key that holds up back.



Making the Dividers

With the basic carcass parts now finished, I turned to the drawer dividers. The dividers are made from poplar with cherry edging. (See Fig. 4.) The edging on the top divider needs to stay square, since it acts as a door stop when installed in the cabinet. I crowned the other edgings slightly with a block plane and sandpaper.

Next, I notched the front corners of the dividers and laid out and cut the shallow dadoes that join these parts. (See detail in Fig. 4.) I made these dadoes with a router plane, first scoring the edges with a sharp knife. You need to cut these joints carefully because there's just a flimsy web of material ($\frac{1}{8}$ in. thick) between some of the dadoes.

I made the "V" cuts in two steps, first sawing the center of the V by hand to the depth of the dadoes, then paring toward the saw cut from each side with a sharp chisel. Next I scribed the ends of the dividers to fit the V's. (See photo, opposite page.) After scribing, I handsawed the shoulders and pared the angles with a chisel.

Once the joinery on the dividers was done, I spread glue in all the dadoes and slid the dividers into the case from the back. It's best to use glue sparingly, since squeeze-out will be difficult to clean up.

To complete the basic box, I made the top fascia and attached it to the case with glue and nails. (See Fig. 1.)

All the nails are cut nails resembling those found on 18th-century furniture (available from Tremont Nail Co., Box 111, Wareham, MA 02571, 508-295-0038). I used two varieties: *clout nails* to attach the base frame to the cabinet, and *headless brads* everywhere else. You could substitute finish and box nails, but I like the authenticity of cut nails and I'm fond of the rectangular patch the brad leaves when it's countersunk and puttied.



To make the ogee profile on the feet, author uses a wooden convex molding plane (with a $\frac{3}{4}$ -in.-radius cutter) to create the hollow and a block plane to shape the convex part.

Making the Base Frame and Feet

With the carcass and drawer dividers completed, I could make the base frame that supports the cabinet. (See Fig. 1.) This is a five-piece frame: three cherry show pieces on the front and sides, and two support pieces of

poplar in the back.

The show pieces are profiled on their outer edges and mitered at the corners, with loose tenons at the miters for reinforcement. I notched the back of the side pieces to allow clearance for the cabinet back to drop down, and I joined the poplar back pieces to the sides with mortise-and-tenon joints. (See Fig. 1.)

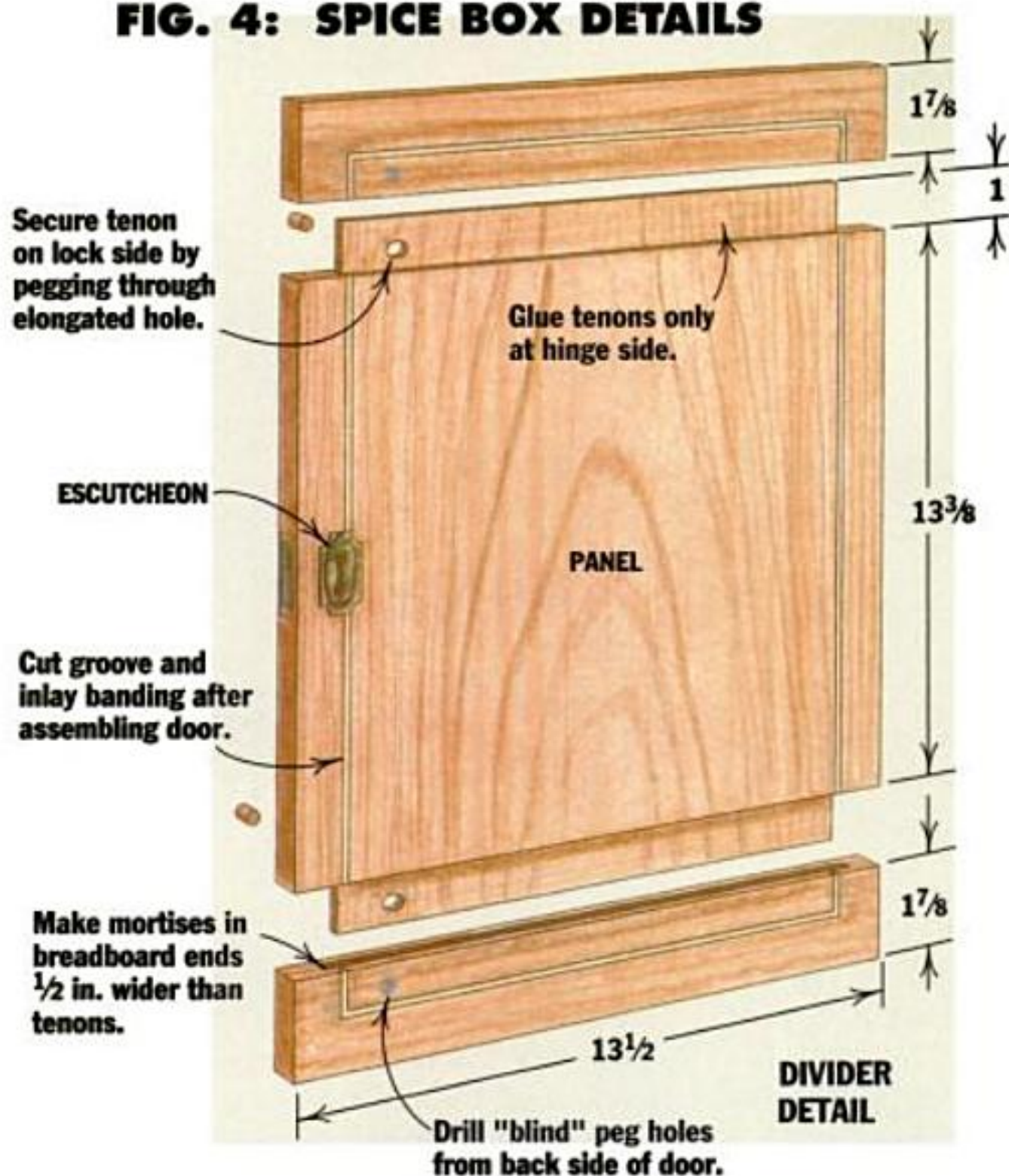
To allow for wood movement between the frame and the cabinet, I spread glue on just the front frame piece and nailed it to the carcass bottom first, then I spread glue on all the tenons and attached the remaining frame pieces to the cabinet with nails.

Next I made the bracket feet. The show faces at the front and sides are made from cherry and have ogee profiles and scrollwork. The parts that face the back are made from poplar. I started making the show pieces by shaping the ogee profile on a blank with hand planes. (See photo.) An alternative would be to cove the piece on the tablesaw and use a round-over bit to rout the convex profile. (See AW #25.)

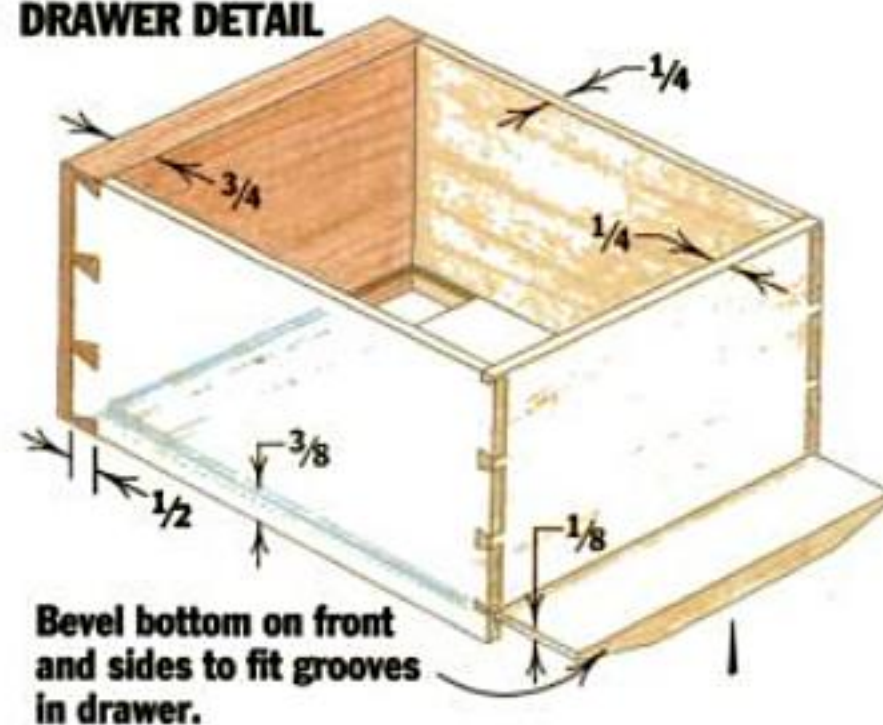
After cutting the profile, I mitered the front feet and cut grooves for the reinforcing splines. Next I cut the dadoes in the rear cherry pieces for the poplar parts. (See detail in Fig. 1.) Then I used a jig saw to cut the scrollwork on the cherry foot parts, glued all the foot halves together, and attached them to the base molding with glue and nails.

For reinforcement, I glued support

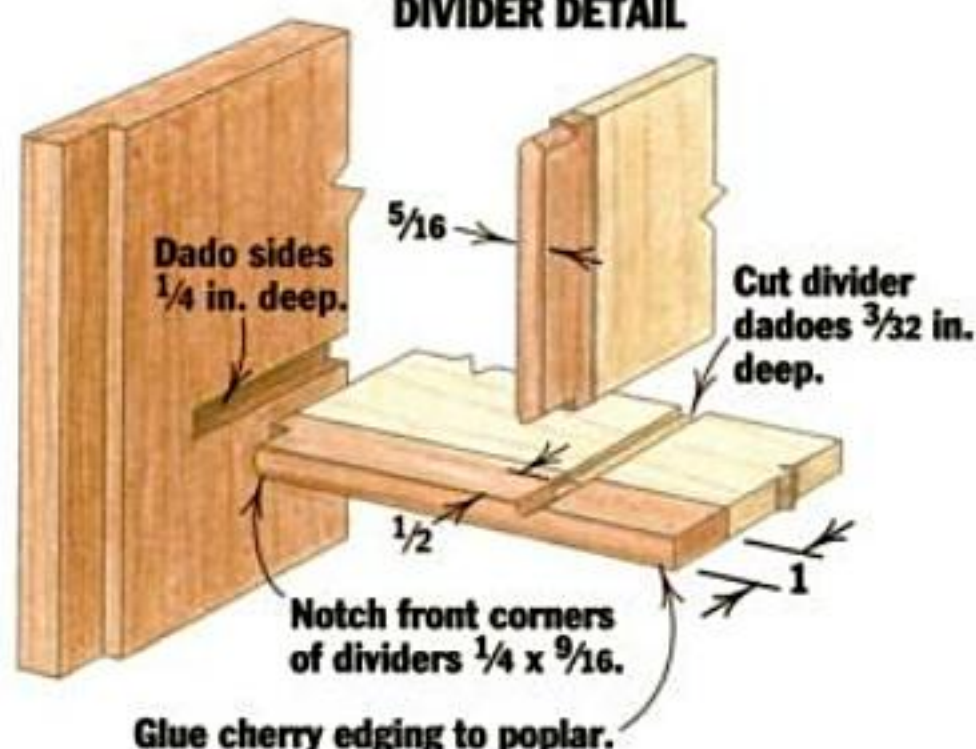
FIG. 4: SPICE BOX DETAILS



DRAWER DETAIL



DIVIDER DETAIL



blocks behind the feet (see detail in Fig. 1), using hot hide glue and rubbing the blocks in place until the glue set. Then I relieved the inside edges of the blocks with a chisel to make them less obtrusive.

Top and Crown Molding

The cherry top is a duplicate of the original and is attached to the sub-top with nails. (See Fig. 1.) Before fastening the top, I sealed the underside with three coats of shellac to minimize warping.

The crown molding on the original was one piece, but I decided to make a two-piece crown so I could use standard router bits in my router table. (See Fig. 2.) I nailed the moldings to the carcass and used glue only on the front moldings and the front portion of the side moldings. If you glue the side moldings along their entire length, cross-grain wood movement could cause the sides to split.

Making the Door

The original door had split because the maker hadn't allowed the center

panel to move along the breadboard ends. To prevent my panel from cracking, I made the mortises in the breadboard ends $\frac{1}{2}$ in. wider than the tenons in the panel, and I glued only the hinge side of the tenons into the breadboard ends, while blind-pegging the tenons in elongated holes at the lock side. (See Fig. 4.) To make sure that glue from the pegs didn't lock the tenons in place, I tapped the pegs in dry until they were just through the tenons, applied a little glue around the pegs, and drove them home.

The inlay on the door's face is $\frac{1}{8}$ -in.-wide holly veneer, $\frac{1}{32}$ in. thick. I cut the groove for the banding with a $\frac{1}{8}$ -in. cutter in a Dremel Moto-tool fitted with a router base and edge guide, making the groove slightly shallower than the veneer's thickness so the inlay would stand proud of the door's surface.

After cutting the groove, I squared out the corners with a chisel, then mitered the inlay and glued it in place, putting glue only in the recess to prevent the banding from swelling. When the glue was dry, I scraped and sanded the inlay flush

with the door's surface. (See AW #19.)

Making the Drawers

The drawers have half-blind dovetails in front and through dovetails in back. (For more on dovetailing, see AW #19 and #29.) The drawer bottoms fit into $\frac{1}{8}$ -in. grooves cut in the fronts and sides and are nailed into the backs of the drawers. (See detail in Fig. 4.)

I started the drawers by inlaying my client's initials and the date of construction on the drawer fronts. (See sidebar, opposite page.) Then I cut the dovetails by hand and grooved the parts on the tablesaw.

I tapered the drawer bottoms to fit the drawer grooves, using a marking gauge to score the edge for thickness and to mark the width of the bevel on the face. I used a block plane to plane the wood between the gauge marks. After assembling the drawers, I hand-planed each one for a perfect fit to its opening.

Fitting the Back

The back of the box is $\frac{1}{2}$ -in.-thick poplar, beveled on three edges with

MAKING INLAYS IN WOOD

Making inlaid letters and designs doesn't require exotic tools, and if you follow a few basic steps, you can produce any shape you like. Here's the method I used when I inlaid some drawer fronts for a spice cabinet I built (see main article):

The first step is to lay out the design. I do this on vellum, a heavy type of tracing paper, taped over graph paper. The graph paper shows through the vellum and gives me guidelines so I can draw freehand while maintaining consistent heights and widths.

After making the design, I photocopy it with the design placed *face up* on the photocopier. This produces a reverse view.

I position the photocopy on the wood to be inlaid with the printed side down, and rub the paper lightly with the tip of a hot iron. This transfers the positive image to the wood.

Next, I cut the outlines of the design on the wood with a sharp knife, then remove the waste inside



Using a shop-made "bird's mouth" with a V-notch on one end, you can control the blade as you cut out your inlay design.

the knife marks freehand using a Dremel Moto-tool fitted with a router base and a small bit. A small router or a small chisel will work, too.

I make the cut slightly shallower than the thickness of the inlay, which should be around $\frac{1}{16}$ in. thick. Then I clean up any remaining waste to the incised lines with small chisels and carving tools.

To make the inlay, I first use rub-

ber cement to glue the inlay material between layers of thin model-maker's plywood (available at craft stores). This "sandwich" gives the inlay stability for cutting to shape. Then, with a soft pencil on thin tracing paper, I make a paper rubbing of the cavities that I've cut. I glue this paper to the top of the "sandwich" with white glue, and to keep the stack from creeping, I bind the outer edges with veneer tape.

I use a jeweler's saw (a coping saw will work, too) and a shop-made "bird's mouth" to cut out the design. (See photo.) After I cut out the design, I use files and emery boards to bevel the edges slightly. Then I carefully remove the plywood with a thin palette knife (available at art supply stores) dipped in acetone.

To install the inlay, I spread glue into the cavity and clamp the inlay into place using waxed paper and wood cauls. When the glue has dried, I level the design with a scraper and light sanding.—C.B.

a block plane to fit the grooves in the cabinet. I planed it for a slightly loose fit in the grooves—any binding would make it difficult to access the secret drawer.

Next, I made the sliding dovetail key (see Fig. 1) from a scrap of walnut. I fit the key to the dovetailed recess in the cabinet's bottom, and then I used a gouge to carve a depression for a finger pull in the key's top surface. With the back in place, I marked the mortise location for the key, and then I chiseled the mortise in the back, being careful not to go through the poplar.

With the major construction complete, I was ready to install the hardware. (See Sources.) I hand-planed the door to fit the opening in the cabinet, chiseled mortises for the hinges and lock, installed the lock and hung the door. Then I cut the mortise in the side for the lock and drilled for the escutcheon pins and the drawer knobs.

The knobs are graduated in size to give a balanced look to the bank of drawers. When buying your knobs,

make sure they don't project more than $\frac{5}{8}$ in. or they'll interfere with the door as it closes.

The pull for the secret drawer is a simple loop of leather lacing pulled through a carved hole in the drawer front and knotted in the back.

SOURCES

Hardware for the spice box is available from Ball and Ball, 463 W. Lincoln Highway, Exton, PA 19341, (215) 363-7330. CIRCLE #616

Hinges, 2 in. by $1\frac{1}{4}$ in., item no. H207-021.

Lock, (left hand) item no. TCB-012.

Escutcheon, item no. L66-007.

Knobs: $\frac{3}{8}$ in. dia., item no. G17-133;
 $\frac{7}{16}$ in. dia., item no. G17-134;
 $\frac{1}{2}$ in. dia., item no. G17-136.

Finishing the Box

To finish the piece, I first sealed it with a liberal coat of clear oil base made by Sherwin Williams (#113-9039), wiping off the excess. I like this base because while it is wet, I can preview the final finish, and if the color isn't uniform, I can add universal pigments to the oil to blend in areas that stand out.

I left the parts in indirect sunlight for several days to dry, during which time the cherry darkened. Then I finished the show surfaces with several coats of 1-pound-cut shellac. After rubbing out the shellac with 0000 steel wool, I completed the box by applying a coat of paste wax over the shellac. ▲



CRAIG BENTZLEY
restores antique furniture and builds period reproductions in his Chalfont, Pennsylvania, shop.



*A Router
and a Bandsaw
Are All You Need*

Rout a recess and bandsaw the body, and you've got an attractive mirror.

HEIRLOOM HAND MIRROR

BY KEN PICOU

Do you have a special piece of wood squirreled away somewhere? Something that you haven't found a use for, but is so pretty that you can't throw it out? Make a hand mirror from it, and that chunk of wood will be admired and appreciated every day, for many years to come. There is no joinery to worry about, so you can be very free in the design. Think of this project as a small piece of sculpture.

As the drawing shows, construction is just a matter of routing a circular recess for the mirror glass, then bandsawing out the mirror body, rounding the edges, sanding and finishing. (For special effect, I also make mirrors from laminated wood, but in this article I'll

concentrate on mirrors made from a single piece of wood.)

If you're only making one mirror, you can lay out your shape directly on the stock. But for my production runs,



PHOTOS BY RICHARD EPSTEIN

Plexiglas templates help you make the best use of wood grain and figure when laying out the mirror parts.

I've developed templates for laying out the glass recess and the mirror body, and I use a hinged routing template (see photos, opposite page) to rout the glass recess.

The template for the recess is just a piece of Plexiglas cut to a 5¼-in.-dia. circle. To make the mirror-body template, I drew the outline of the body, bandsawed it out and smoothed the edges. Plexiglas lets you see the wood underneath, helping you make the best use of grain and figure. But thin pieces of Masonite or plywood will also work fine.

Making the Mirror

I plane my stock to about 5/8-in. thickness and then lay out the glass



For production runs, author lays mirror blanks under the opening in a hinged circle template, then clamps the template to hold the board and routs the mirror recess.



Cut out the mirror body on the bandsaw, then round over and smooth the edges.

recess first with the circle template. Next, I center the mirror-body template over the layout line for the glass recess and draw the outline of the body. (See photo, opposite page.)

Now I can clamp the mirror blank under my hinged template as shown in the photos above. The template has a 2x4 plate screwed to the bottom which lets me mount it quickly in my bench vise. For production runs, I draw the shapes of several mirrors on a long board, then clamp them under the hinged template board to rout several recesses in succession.

You can make a simpler routing template if you only intend to do a handful

of mirrors. Just use a piece of plywood that's thick enough to accommodate your router's template guide bushing. Remember to size the template circle with the offset of your guide bushing in mind. Also, you want the glass recess to end up about $\frac{1}{8}$ in. wider in diameter than the mirror glass, to allow for wood movement.

To rout the recess for the mirror, mount the template to the stock by screwing through the scrap surrounding the mirror blank. I work with a straight bit set for a $\frac{3}{8}$ -in.-deep cut and waste the stock inside the template. I clean out the chips, then make the final cut, running the template guide firmly

against the inside edge of the template.

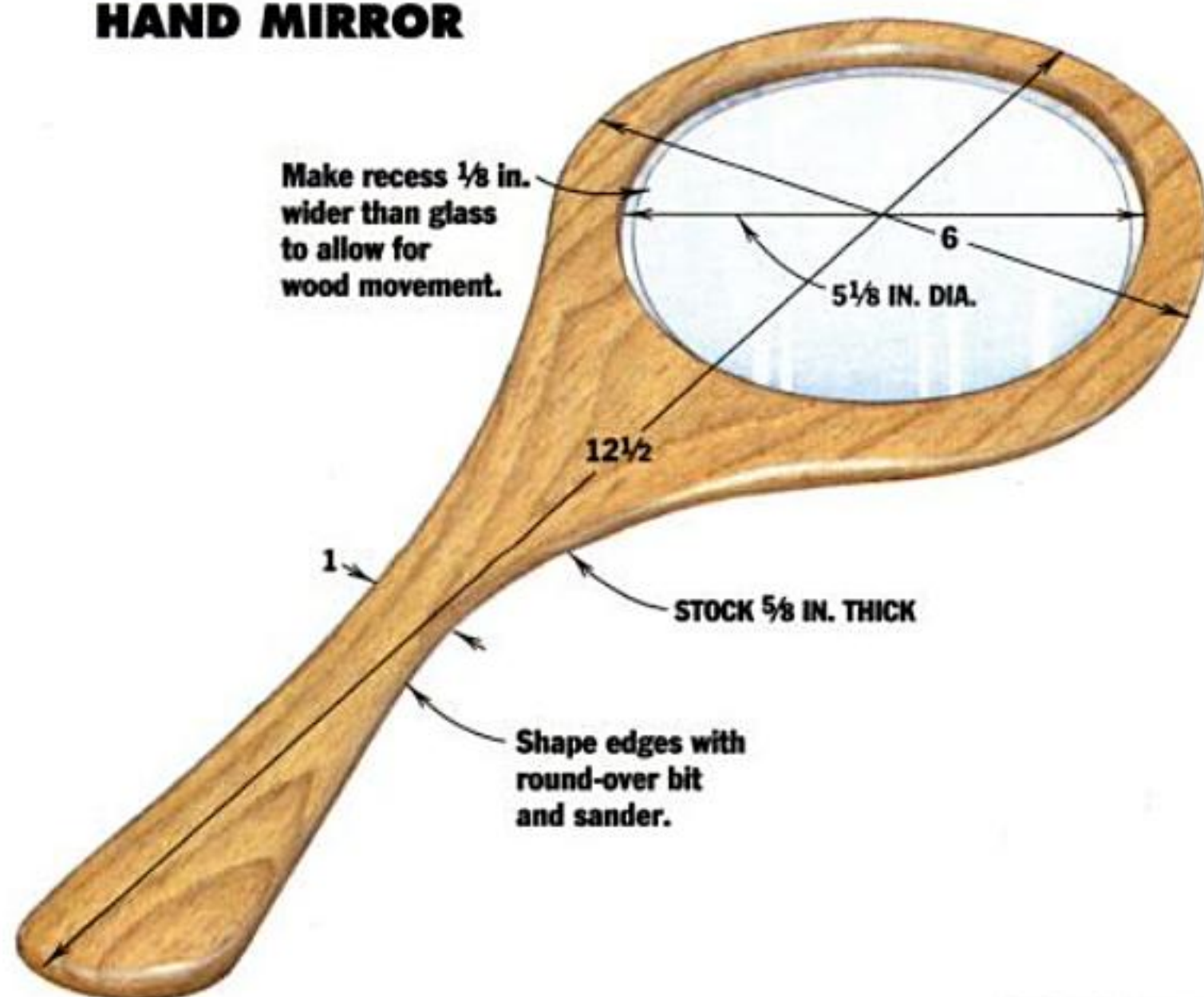
Once the recess is done, I cut out the mirror body on a bandsaw (see photo above), then round over the edges with a round-over bit and smooth the edges with a sanding drum.

To make my mirrors look more like sculpture, I shape a gentle crown on the back. I do this freehand on an inflatable sanding drum, but you can also shape it with a belt sander and then by hand with 60-grit paper. To finish sand, work up to 400 grit.

I prefer polymerized tung oil for the finish because I find it more durable than other oils. I work it in by hand, sanding lightly between coats with 600-grit paper. To hold onto the mirror while I'm oiling, I hot-glue a 2-in. by 2-in. scrap block in the recess.

For the glass, I use 5-in.-dia. beveled mirror glass (available from Shapes and Surfaces Ltd., 1649 Sycamore Ave., Bohemia, NY 11716, 800-647-7672). To install it, I put a few dabs of clear silicone sealer in the recess. This flexible adhesive helps prevent the glass from cracking when the wood moves with changes in humidity. I rotate the glass while inserting it to spread the sealer into a uniform, resilient base. ▲

HAND MIRROR



DRAWING BY FRANK ROHRBACH



K E N P I C O U

is a furniture maker in Austin, Texas. He builds and markets many of his own designs.

*Challenge Yourself:
Turn These Thin-Walled
Salt and Pepper Shakers*

SHAKERS WORTH THEIR SALT

Delicate and beautiful, these cocobolo salt and pepper shakers have $\frac{1}{8}$ -in.-thick walls. The stopper (inset) is turned from the same piece of wood as the shaker.



BY DAVID ELLSWORTH

These salt and pepper shakers are well within the grasp of the intermediate turner, though they're a challenge.

I've designed some templates that make it simple to produce a perfect sphere, and you can make the small tools for working the inside from allen wrenches and old screwdrivers. (See sidebar, page 41.)

The elegant design of these shakers comes from the purity of the spherical forms, the use of beautiful wood and the offset holes, which add some personality to the forms. This pair is made from two 3-in. cubes of cocobolo, but most fairly dense woods will do. (If you've never turned hollow forms with bent tools, you may wish to practice with inexpensive materials first.)

Making the Shakers

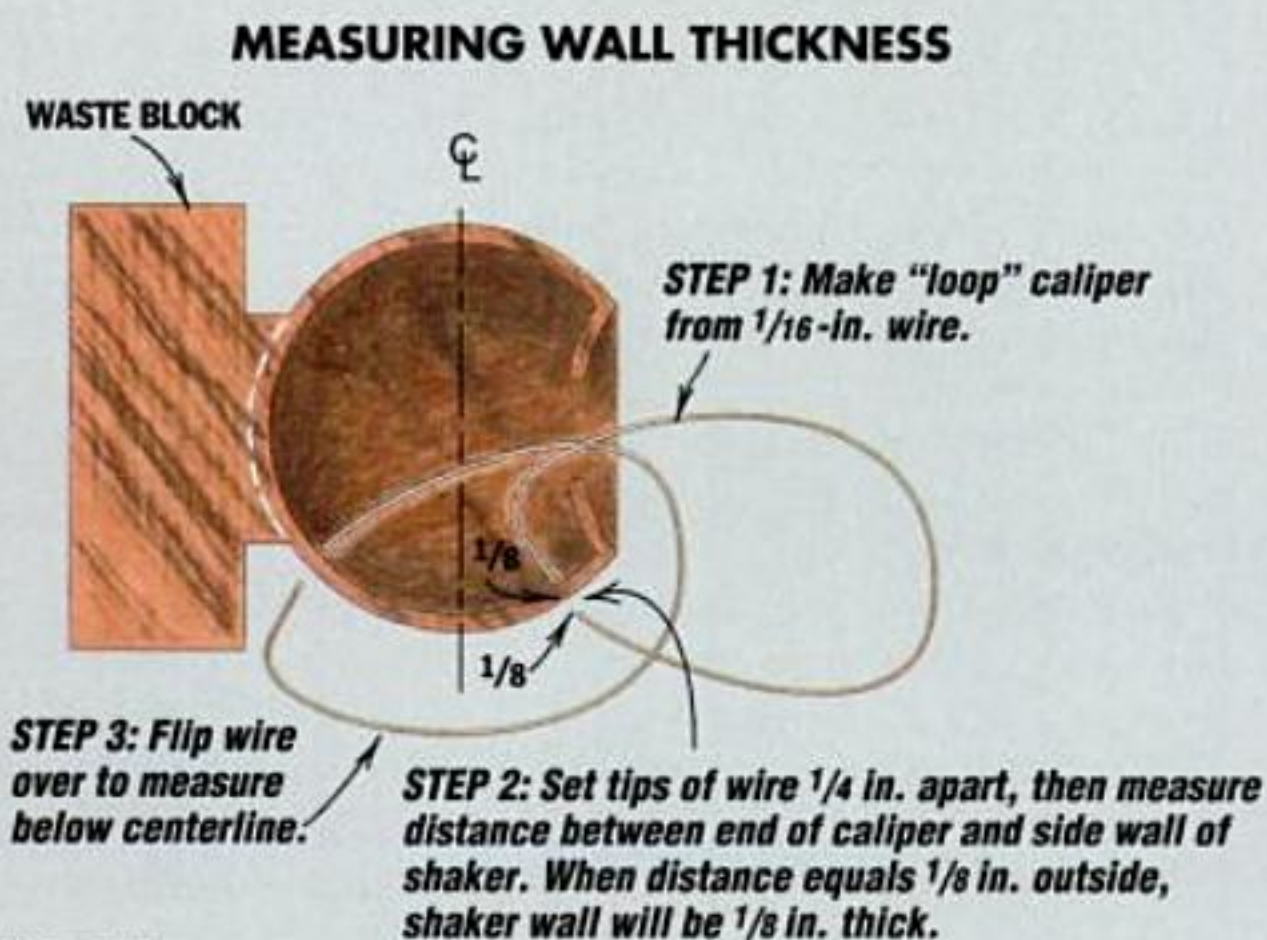
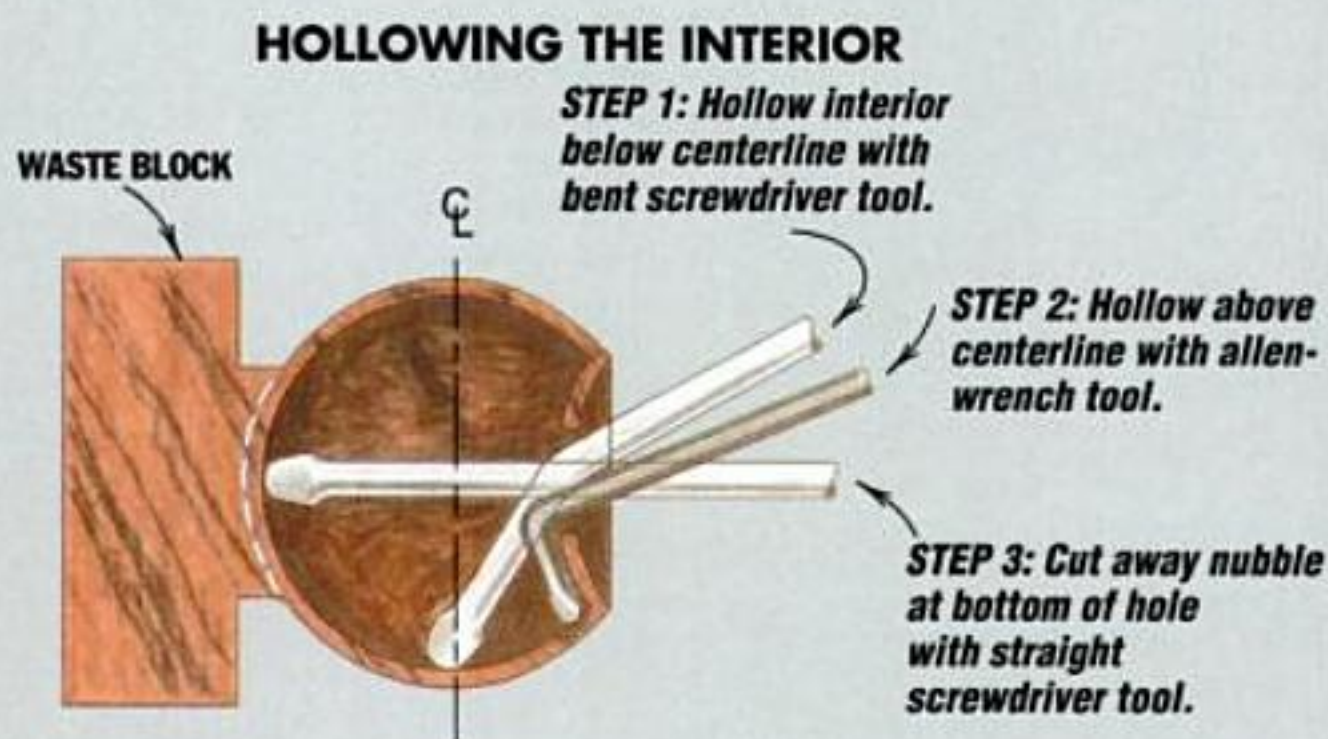
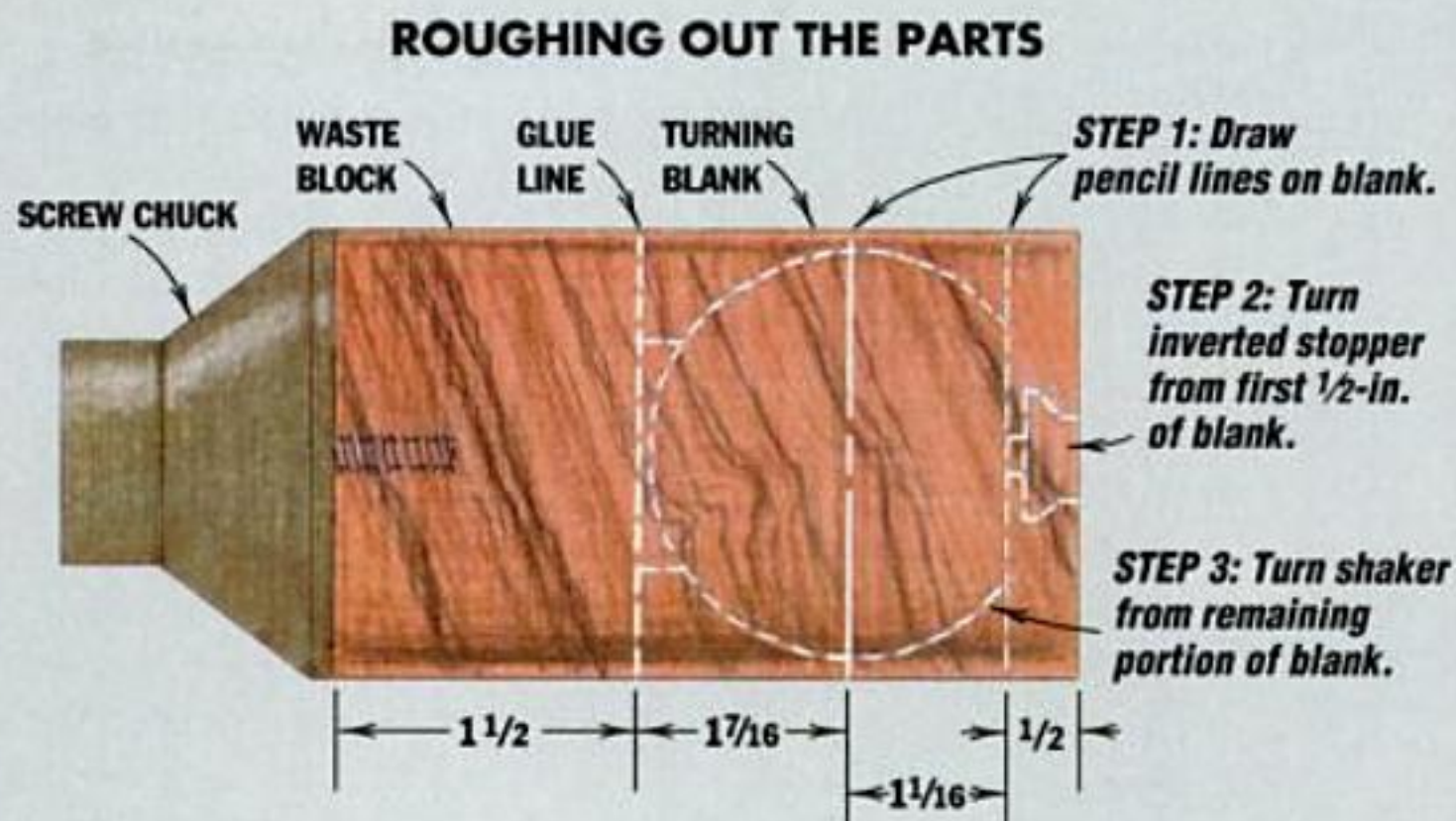
As the drawings in Fig. 1 show, you turn the stopper from the right end of the turning blank and then make the shaker from the remainder of the blank, turning the interior walls to $\frac{1}{8}$ -in. thickness.

Selection of material is important if you want the grain pattern in both shakers to match. You can book-match the grain by ripping a thick billet in half, so one shaker is a mirror image of the other. Alternatively, to align the grain side by side, you can crosscut a long billet in half.

To mount each blank for turning, you glue it to a waste block and then thread the waste block onto a screw chuck on the lathe. I use a Glaser screw chuck (Model #88, available from Craft Supplies USA, 1287 E. 1120 S., Provo, UT 84601, 801-373-0917). Prepare your blanks for mounting by selecting the surfaces which will appear at the top of the shakers (you'll want face grain here, not end grain) and planing them flat with a hand plane. If you are starting with flat blanks of an oily wood like cocobolo, scrape the blanks with a cabinet scraper or wide chisel, since any oil on the surface will hinder a good glue joint.

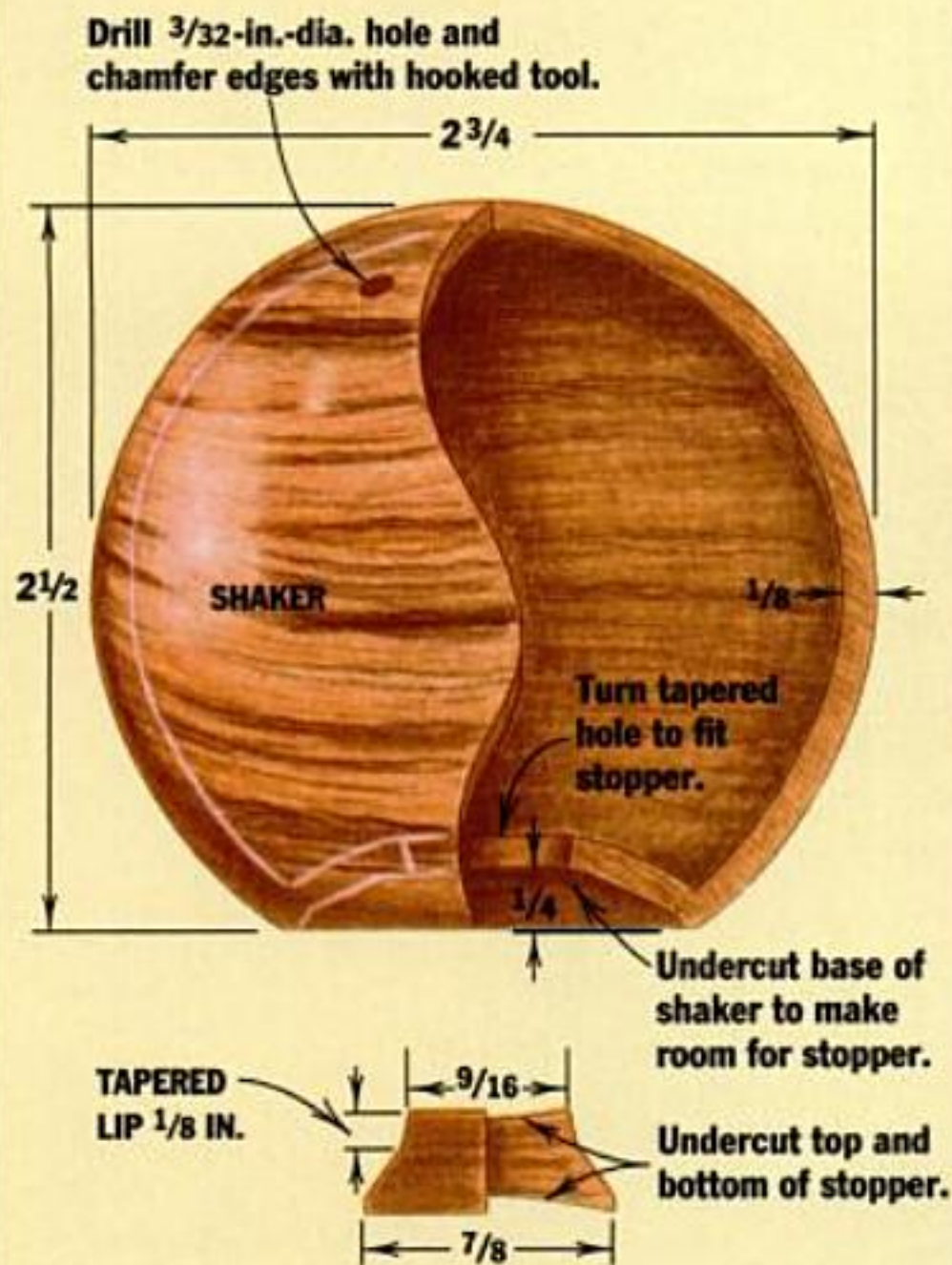
Now, mark the center point on the opposite face with a sharpened nail or awl. This hole will receive the point of the tailstock live center to align the blank when gluing to the waste block.

FIG. 1: TURNING DETAILS



DRAWINGS BY GLENN HUGHES

FIG. 2: SALT & PEPPER SHAKERS



Next, make a waste block from a $1\frac{1}{2}$ -in.-thick, 3-in.-square block of fine-grained, nonresinous scrap material such as maple or walnut. Mount it on the screw chuck and turn the block to a cylinder, then face the surface *dead flat* with a gouge or scraper. To check for flatness, press the side of the gouge to the face of the block while it's spinning. This will burnish the wood where there are high spots. Trim away the burnished spots, then press the hand-planed surface of the workpiece to the spinning surface of the waste block. Again, high spots will appear as rings on the waste block. (See photo, above.) Scrape these until the surface is dead flat.

I glue the turning



When flattening the waste block, press the workpiece against it while the waste block is turning. High spots will appear as burnished rings.

blank to the waste block with "gap-filling" Super Glue, using Hot Shot accelerator to speed the bond (both available from Craft Supplies USA, 801-373-0917). **Caution:** Make sure you spray accelerator on any glue that drips from the joint, *before* turning on the lathe. Otherwise, you could end up coated with the glue that spins off the blank. In addition, fumes from cyanoacrylate glues—especially those from accelerated glue—may cause severe headaches and/or dizziness. Be sure to work in a

A SNUG-FITTING COMPRESSION CHUCK

A compression chuck is a handy way to hold round turnings for drilling or finish-turning, and it's simple to make.

Start with a cube of fine-grained, kiln-dried wood (like maple or walnut) that is larger than the turning you need to chuck. Mount the cube onto a screw chuck, then turn it to a cylinder and square off the face.

Mark a circle on the face that is the same diameter as the turning you will mount in the chuck, then turn the interior of the chuck to this line, creating a slightly tapered wall. (See drawing.) It's best to make clean cuts with a gouge or scraper and *not* to sand or finish this interior surface. This will give better contact when your turning is inserted. You can cut expansion slots in the chuck with the tablesaw or bandsaw.

You can use this chuck numerous times, but take care to feed the screw chuck into the original thread each time it is used. Also, *always* check the chuck for roundness before you use it. Wood moves, and the chuck won't work if it isn't running true.—D.E.



With its tapered inner walls and expansion slots, this shop-made compression chuck will hold round pieces for finish-turning or drilling.

COMPRESSION CHUCK

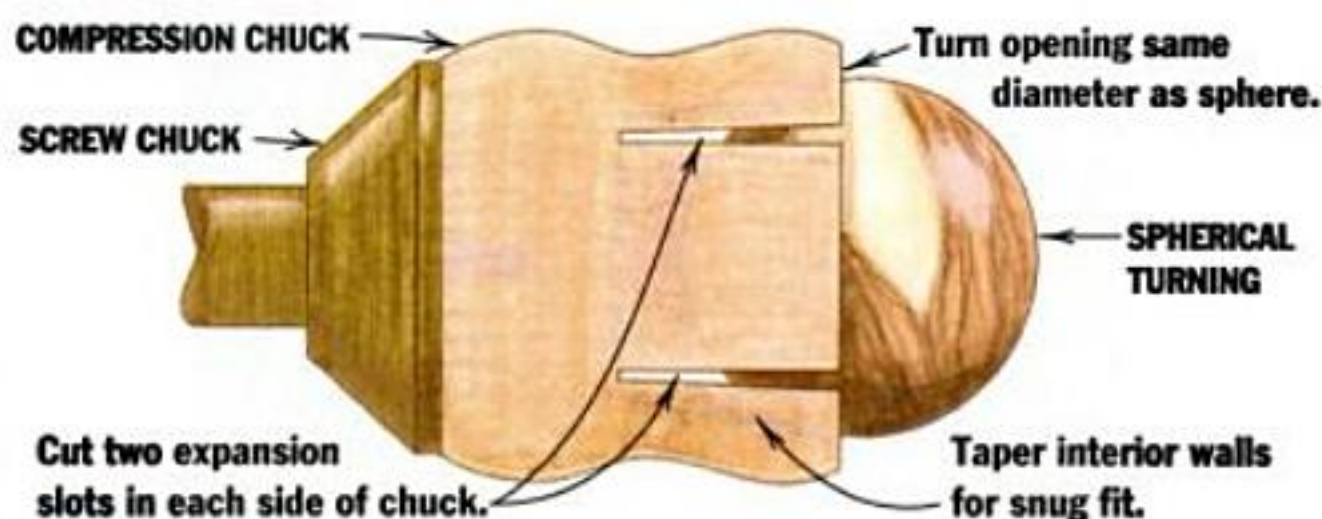
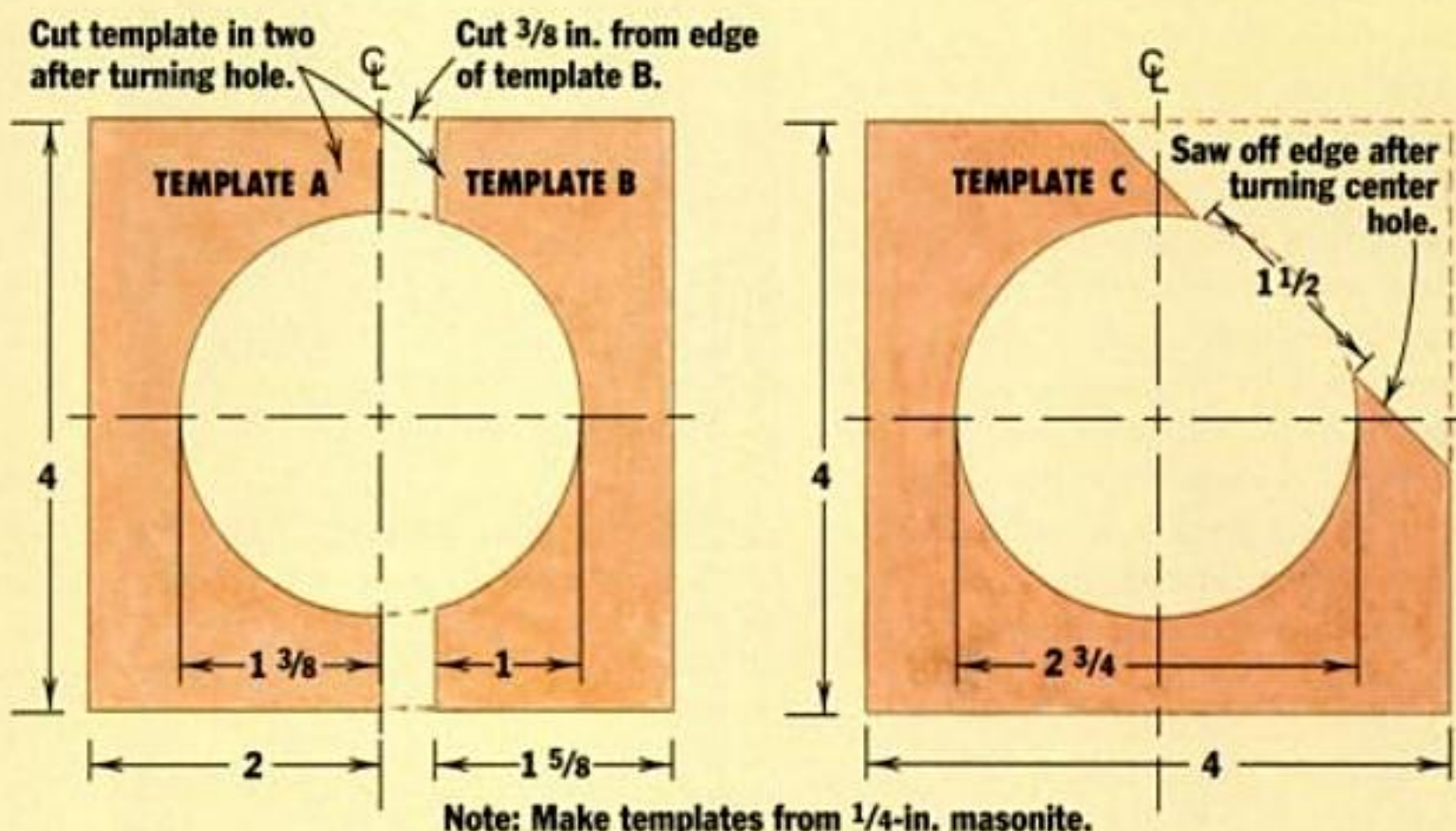


FIG. 3: TURNING TEMPLATES



Author turns two circular templates at once by mounting them on a screw chuck, then using a parting tool to turn away to a marked line.



well-ventilated space.

Once the glue has set, turn the blank to a cylinder $2\frac{3}{4}$ in. in dia. (see top left photo, below), using template A as a guide. (See Fig. 3.) Turn the face flat, and while the blank is turning, use a pencil to mark one line $\frac{1}{2}$ in. from the face and a second line $1\frac{1}{16}$ in. from the face. (See bottom left photo.) The first line indicates the section of the blank that will become the stopper, and the second line denotes the center of the sphere you're going to turn.

With the tailstock in place for sup-

port, turn the stopper and shape it with a parting tool to the dimensions shown in Fig. 2. Make sure the plug is slightly tapered, so it will make good contact with the hole in the finished shaker.

Now, back off the tailstock and turn a slight undercut on the face of the stopper. (See Fig. 2.) Sand and finish, then part off the stopper and set it aside. You'll finish-turn the bottom surface of the stopper later.

Next, return the tailstock for support and start turning the shaker. Working from the remaining pencil

line, use a $\frac{1}{2}$ -in. "superflute" gouge to turn the right side of the cylinder to a hemisphere, again with template A as a guide. (See top right photo, below.) To refine the shape, back off the tailstock and place template A firmly against the spinning wood. This will burnish the high spots, which can then be turned away. When the shape is perfect, the ends of the template will line up with the pencil line. (See top right photo, below.)

With the right side of the sphere finished, drill a $\frac{1}{2}$ -in.-dia. hole in the



Author uses a template to measure circumference and turns the blank until the template fits.



To delineate the sections of the turning, mark them off with a pencil while the blank is spinning.



Author checks spherical profile of the top and bottom of the shaker with templates A (above) and C (below).



blank, using a Jacobs chuck in the tailstock. The hole should be approximately 2 in. deep, but in any case it should stop $\frac{5}{16}$ in. short of the glue joint at the base of the turning blank. That leaves enough room to turn a shaker with a $\frac{1}{8}$ -in.-thick wall. After drilling the hole, undercut the area surrounding the opening to a depth of $\frac{1}{4}$ in. from the rim. (See Fig. 2.) This provides clearance for the stopper. For this cut I use a $\frac{1}{4}$ -in. gouge with a convex bevel. The convex bevel lets me work a tighter curve than a concave (hollow-ground) bevel would.

Now you can turn the left side of the sphere, using template C as a guide. (See Fig. 3.) Be sure to leave a $1\frac{1}{2}$ -in.-dia. supporting stem at the base of the blank. (See bottom right photo, previous page.) Gouges and scrapers are hard to fit between the sphere and the waste material, so I finish-turn this area with shear scraping cuts from the side of a specially ground parting tool. (See photo, top right, and sidebar, opposite page.) When you're done turning, sand and finish the entire sphere.

Now it's time to hollow out the interior. I use several shop-made tools for this work. (See sidebar, opposite page.) Make the initial cuts using the *small* bent screwdriver tool and working as shown in Fig. 1. Take light cuts at first, and stop the lathe frequently to remove shavings so they don't build up and grab the tool.

Next, use the allen-wrench tool to cut the area closest to the hole as shown in Fig. 1. Then continue cutting and smoothing along the inside wall with the bent screwdriver tool. To finish cutting the center area, where the "nub" forms, use the straight screwdriver tool.

Caution: Using the bent tool to cut the center area in the bottom can be hazardous to the entire process. It has a tendency to skip off the nub and grab the upward-rotating surface of the wood—blow-up time!

Also, throughout the hollowing process, take care to prevent the shaft of the tools from rubbing against the entrance hole. If the tools touch, they'll not only wear down the hole but cause excessive heat which can crack the wood—especially dense woods such



To work the tight space at the base of the sphere, author makes shear scraping cuts with the side of a specially ground parting tool.



Use the tailstock to seat the shaker in the compression chuck, taking care not to push too hard on the shaker's delicate walls.



A curved-tip scraper made from a cement nail flares the edges of the shaker's holes.

as rosewoods, which contain a lot of resin. The shavings also get hot as they're cut, so remember to clear the interior, perhaps as often as each cut.

Measuring wall thickness is quite simple. Fashion a "loop caliper" (see Fig. 1) from a piece of $\frac{1}{16}$ -in.-dia. spring wire or other stiff wire that will retain its shape. Notice how this wire is shaped, with the leg of one end pointing to the tip of the other end.

Positioned one way, it registers wall thickness just inside the lip of the opening. Flipped over, it registers wall thickness near the bottom of the form. If you want a wall thickness of $\frac{1}{8}$ in., set the gap between the tips to $\frac{1}{4}$ in. Touch one tip to the inside wall, and when the gap on the outside measures $\frac{1}{8}$ in., the wall thickness will also be $\frac{1}{8}$ in. Pretty high-tech!

After hollowing the inside, fit the stopper to the hole. First make scraping cuts with the straight screwdriver tool until the stopper seats firmly. Take *ultra-light* cuts, or you may end up having to turn a larger stopper. When the stopper fits, tap it firmly into the hole and finish-turn its bottom to a nice concave profile. (See Fig. 2.) When you're through, the rim of the stopper should be below the base of the shaker. Sand and finish.

Finally, pry the stopper out of the hole with a screwdriver and sand the hole lightly until the stopper fits snugly. If all has gone well, the grain of the stopper will be a book-match of the grain on the base of the shaker.

Now, use a parting tool to part the shaker from the waste block, taking care not to cut into the profile of the sphere. Mark the center of this parted-off section with the point of a sharp nail. This will help you center the shaker in the compression chuck. (See sidebar, page 38.)

To finish-turn the top, loosely position the shaker in the compression chuck—stopper side facing inward—and draw the tailstock forward, positioning the point of the live center into the nail hole you just made in the top surface. The shaker is *very fragile*, so compress it slowly into the chuck using the handwheel on the tailstock. (See photo, center left.) You want a tight fit, but don't overdo it with too much pressure.

Remove the tailstock and check to be sure the sphere is secure. Finish shaping the sphere with a small-tipped scraper or a small gouge, using template B as a guide. Take light cuts to prevent popping the shaker loose from the chuck. (I often use the fingers of my left hand to add a slight amount of pressure against the shaker while the tool does the cutting.) Sand and finish while the shaker is still on the lathe.

SHOP-MADE TURNING TOOLS

Over the years, I've found that some of my best turning tools are made from things I have lying around the shop. Pictured here are several tools made from allen wrenches, nails and screwdrivers. They are easy to make and quite effective in use.



Allen-wrench turning tool—(Second row, left in photo.) To make a bent tool from an Allen key, first turn a handle from medium-density wood. The handle should fit your hand—about 4 or 5 in. long is good. Drill a hole in the handle the same diameter as the cross section of the allen wrench. Then tap the wrench into the hole, so the shape of the hole conforms to the shaft of the wrench.

Next, remove the wrench, put in a few drops of "gap-filling" Super Glue, spray the shaft with Hot Shot

accelerator and jam the shaft back into the hole. (Super Glue and Hot Shot accelerator are available from Craft Supplies USA, 801-373-0917.) Grind the tip to the shape of a simple round-nose scraper, relieving the bottom edge 5° or so from the top edge. The tip should extend no more than $\frac{5}{8}$ in. from the bend. With the $\frac{3}{16}$ -in.-dia. wrench shown here, I extend the end no more than 2½ in. from the handle.

Screwdriver turning tools—(Bottom four tools in photo.) Making bent and straight tools from standard screwdrivers is also simple. Start by grinding the tips to the shape of a round-nose scraper, as with the allen-wrench tool. At this point the straight tool is complete. For bent tools, place the shaft in a vise and heat the shaft with a propane hand torch until it's red. Then grab the tip with a wrench and bend it to 45°. The finished tip should extend no more than $\frac{1}{2}$ in. from the bend.

These little scrapers cut very well, even though they're not made from exotic steel. And they stay sharp for a surprisingly long time. To resharpen them, use a flat file instead of a grinder. This removes less material and helps preserve tip life. If you want to harden a tip, heat the metal to cherry-red and plunge the tip into motor oil.

Cement-nail tool—(Second row, right.) This tiny scraper is made from a hardened cement nail that's glued into a wood handle with Super Glue. The curved tip is not bent but shaped from the shaft of the nail with a chain saw file. Sounds primitive, but it works wonders.

Modified parting tool—(Top row.) While this doesn't strictly qualify as a tool made from scrap metal, it is a handy shop-made tool. I make this parting tool, which I call a "barracuda," by grinding away one side of a $\frac{3}{16}$ -in.-thick by $\frac{5}{8}$ -in.-wide round-nose scraper. I sharpen the concave bevel upside down on the grinding wheel, so the tip is at least $\frac{1}{16}$ in. below the center line of the tool. On dense materials, the edge of this curve will produce a very clean, shearing cut.—D.E.



If the sphere gets stuck in the compression chuck when you try to remove it, gently pry open the chuck's slits with a screwdriver.

The placement of the holes in the top of each shaker is a matter of personal choice. I like to place them slightly off-center from the top and in harmony with the grain of the wood. Whatever your choice, mark the hole locations with the point of a nail and drill carefully with a $\frac{3}{32}$ -in.-dia. bit. Place the shaker in the compression chuck, and position the tailstock center in the drilled hole so the hole is on center when the shaker is in the chuck. Then, with the lathe running, flare the edges of each drilled hole by scraping with the edge of the tiny hooked tool. (See bottom photo, opposite page, and sidebar above.)

Finishing Touches

When choosing a finish for the shakers, keep in mind that salt and pepper shakers get a lot of hard use and often a lot of sun exposure. I use an acrylic spray lacquer called "Crystal Clear" made by Krylon (available at art supply stores), although any clear spray lacquer will do. After the finish has hardened, I buff off the residue with a hard, 6-in.-dia. stitched buffing wheel, using brown tripoli as a cutting agent (available from Gesswein Jewelry Supply, Box 3998, Bridgeport, CT 06605, 800-243-4466). Then I apply wax to a soft, 6-in.-dia. unstitched buffing wheel and buff the shaker with it.

After buffing, set out the shakers for your friends to admire and use. And if you're really brave, you can surprise

them by replacing traditional black pepper with Jamaican Scotch Bonnet hot pepper (available from Island Style Foods, Inc., 473 Gaspar Ave., Deltona, FL 32725, 407-574-5080).

At least you'll find out who your friends are. ▲



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AN APPROACH TO DESIGN

*From Idea to Finished Form:
A Furniture Builder Tells
How His Work Evolves*

BY RON LAYPORT



As a kid I was always building something or other, using bent nails, tree limbs, orange crates and gobs of shellac. I'd just get something in my head and figure out how to make it. I'd never heard the term *designer*.

Even now, I'm a bit intimidated when I consider myself a designer. It's as though I'm supposed to know some great secret that others don't. I'd rather think of myself as a *builder* of furniture. As a builder, I don't feel that I have to know all the answers before I start—I'm free to discover, to figure things out as I go along. For me, it's a continuation of the process I started as a kid. It's still the kid in me that creates, only now I use planks of walnut and maple instead of orange crates.

I believe there's a designer in each of us, just waiting to be turned loose. You don't have to be an engineer or a fine arts major to design and build one-of-a-kind furniture. (I wasn't even a woodworker until about nine years ago.) But you do need to ask yourself two questions *before* you pick up a piece of paper or a set of plans: "What am I trying to accomplish?" (what's my real purpose) and "With what?" (what are my materials, tools and skills). The answers will often bring the designer out of hiding.

I built my very first piece of furniture using a set of plans, a few simple hand tools and two beech planks I had found in an old storage shed. By rescaling the plans to fit the limitations of my wood, I ended up with a piece that was entirely different in scale and proportion from the original, but true to its predecessor in its concept and joinery. In essence, I had begun to design.

In this article, I'll share my thoughts and attempt to remove some of the mystery from the design process. Hopefully this will encourage you to explore and develop your own creative potential.

This article is the first in a series on furniture design. In coming issues, we'll bring you the insights of a lively and diverse group of furniture makers and design professionals, on topics of interest to any woodworker who wants to design furniture.

Detail of hutch shows sensitive blending of color, proportion and detailing.

PHOTOS BY CHUCK FUHRER

著作物

It Starts With a Passion

I've yet to meet a woodworker who isn't passionate about his or her work. We all love the process of woodworking. But all too often we rob ourselves of the most rewarding part of the process. By strictly adhering to someone else's plans, we end up cloning their work, when for the same effort we could create a piece with more personal value.

My design passions hark back to a simpler time, when more importance was placed on the individual—a time when work was not measured in terms of increased productivity or billable hours, but in terms of creating something useful and of lasting value. I admire the individual builder of the 19th century, who more often worked in a shed than in a well-equipped shop. He worked to fill a *need*, using whatever materials were available, and his creativity was inherent in the building process. For instance, the depth of a cupboard might well be determined by



Hand-planed surfaces and chamfers cut with a drawknife help give this table its primitive look.

the width of an available board.

I've tried to maintain these values in my furniture, using hand tools, traditional, honest joinery and simple oil finishes. My machines do the roughing, then I do the joining and work the surfaces by hand. With their less-than-machine-perfect surfaces and their

many idiosyncrasies, my pieces are living evidence someone was there.

I contend that we can develop our sensitivity as a design tool. To me, true design happens somewhere between the hands and the heart. And just as we train our hands and develop our skills, we can also train our eyes and develop our senses.

I've spent countless hours just staring at furniture and other objects—touching, feeling, examining surfaces, memorizing colors—and most importantly, asking myself questions: "Why did I stop to look at this piece? Why do I feel this way (about its color, proportions, detail)? What does it remind me of? Why did the builder do this or that?"

When I design a piece, I always have an individual in mind. Whether it's a real person or just a figment of my imagination, I'm building to fit the specific need (and often specific dimensions) of a specific individual. I have to address these needs if I want the piece to be useful and not merely decorative.

I also have to consider my materials. If there's no way for me to get walnut, I'm not going to visualize the piece in walnut. Likewise, I consider my skills. Until recently, I didn't know how to turn wood on a lathe, so I didn't think in terms of round legs.

Wood Calls the Shots

Early in my woodworking experience, I developed the notion that each board in my possession had somehow been entrusted to me for a specific use.



Contrasting woods and delicate details add interest to this desk.

Although a board is related to others from the same tree, its individual beauty is not to be taken lightly. My job is simply to reuse the tree, arranging its individual parts to achieve their fullest potential.

I have yet to design a piece of furniture before I have the wood. I buy wood when it presents itself. I hoard wood: I stockpile it until the opportunity to use it comes along. Thus, the wood itself plays an active role in the piece's design.

My obsession with wood has been known to create havoc in my tiny workspace. There have been times when I literally could not get into my shop to work, not to mention the evening I had to be rescued from the far corner of my shop after unstacking my woodpile.

I find it very painful to consider ripping a wide board that has lived more than two of my lifetimes and certainly deserves to be admired awhile longer. Instead, I try to display that board for the appreciation of future observers.



Author devises joints and structures to counteract wood movement, using one piece to lock another in place.

Right or wrong, I go to great lengths to use a single board where three narrower boards, glued up, might be less likely to cup. Through the use of joints or frames and panels, I can usually figure out a way to "outsmart" the wood—to counteract the movement



Cherry dividers act as a color "bridge" between the maple drawer fronts and walnut carcase.

of one board by the proper use of another. (See photo, left.)

I never prepare measured drawings or work from a cutting list, ripping and planing all the boards from shop "stock." When I start a piece of furniture, I have a general notion about its size or color or proportion, but I don't know what the piece will look like until I start putting it together, one board at a time. The wood often makes the final design call. The width of a dining table, for example, will probably be determined by the total width of the planks I've selected. I may choose planks to come close to a *desired* width, but I won't rip them just to match an *arbitrary* width. This way, I'm designing with the wood's dimensions, instead of designing speculatively on paper. I think that's the way a builder would have done it 150 years ago. It takes a bit of trial and error, but it's far more exciting.

One pleasant by-product of this approach is my less-than-impressive scrap pile. In nine years of building, the scrap I've accumulated wouldn't fill a standard telephone booth.

The color of the wood is a major design element. I try to take advantage of color variations within a given species and of color relationships between different woods. I also consider how a wood's color will eventually change under an oil finish, as light and time work their magic. I take into account that the light pinkish hue of freshly oiled cherry will move toward the rich, deep values of walnut and farther from the mellow honey color of maple. I often use cherry as a visual bridge between two woods, as if I were painting on a canvas. (See photo, left.) In this case, though, the "painting" isn't actually

complete until the wood has aged.

Directional light is a useful tool for composing with color. I usually look at my rough-planed boards both in direct daylight and again under incandescents to see how different lighting conditions will affect them. I'm sure my neighbors wonder about the madman who stands seven or eight huge planks on end outside his shop at 8 A.M., and then paces back and forth, flipping and re-flipping them, slopping mineral spirits on them (to light up the figure), writing notes and drawing arrows on them (grain direction, this-end-up, etc.), carrying them back inside—only to bring them out two days later and repeat the entire ritual.

I happen to like wood's imperfections. There is a school of thought that believes only perfect, straight and clear lumber is beautiful and that flawed wood should only be found in the scrap bin. On the contrary, imperfections can become major design

elements, such as when book-matched on adjacent door panels or positioned as the central focus on a tabletop. I would encourage you not to miss such opportunities.

As a rule, I avoid using wood that has structural flaws, although I've made exceptions on pieces I've built for myself, such as my coffee table. The three top boards of my coffee table were so deeply and naturally checked that they begged to be used just as they were. I joined them with exposed-tenon breadboard ends and with sliding dovetail stretchers across their bottom surfaces, to achieve the primitive simplicity and honesty I wanted in the piece.



Vertical back boards visually lighten this wide hutch.

Form and Detail

When I look at furniture, my eye seems to crave verticality. Maybe it's because that's the way the tree originally grew. Graceful, slender forms appeal to me more than heavier, bulkier ones. I tend to make my cupboards tall and narrow, to give them almost giant scale without massive visual weight.

I can lighten the visual load by dividing wide forms into a series of verticals. (See photo below.) If I'm building a wide, flat table, I try to give the vertical legs a more delicate proportion. Or instead of one wide drawer on a case piece, I'll make several narrower drawers side by side to break up the horizontal visual strength.

I also break up mass and visual boredom with what I call "beading." It might be tiny scratch-beads on the edge of a door or upright, or heavier beaded forms running the entire height of a piece. These beads work to subtly enhance the vertical effect by leading the eye. (See photo, right.)

Details, such as hand-cut beads, delicate hand-cut dovetails, tiny moldings and hidden compartments, reward those who examine a piece closely. But more importantly, they are rewards to the builder himself for spending the time.

Surfaces and Finishes

I also try make my furniture inviting to the touch—I don't want to be afraid of it. This is partly my reaction to the formal mahogany furniture I grew up with in the 1940s. I lived in dread fear of scratching those perfect surfaces. Today, when someone asks if I put my feet on the table at home, I can, with great pleasure, answer yes.

I want to be able to *feel* the wood when the piece is finished. When I started building furniture, I used to grind surfaces into submission with a belt sander, but now I prefer the textures I can produce with a scraper. I like the way a scraper follows the curly grain of tiger maple—you can literally feel the ripples in the wood. Hand tools allow a bit of my humanity to remain.

The finish is my final design element. I use an oil finish exclusively—



Author uses "beads" to enhance the vertical feeling of a piece.

usually three coats of hot linseed oil followed by two or three coats of tung oil—because it highlights the grain yet doesn't cover up the texture of the wood. (See sidebar, page 48.) Each coat is rubbed out with 0000 steel wool after at least a full day's drying time.

The Bottom Line

For me, design is not a "style" but an attitude—an honest respect for myself and my materials, and a desire to push both to their limits. It's allowing myself the freedom to experiment. Most of what I have learned has come to me just short of total disaster. It's all part of the learning process.

I would encourage anyone working from plans to use them only as a general guideline. Take liberties, break rules, change proportions, extend height, eliminate undesirable elements. Do a few trial runs with scrap until you get the effects you're looking for. Consider how the piece will be used and who will use it. Design rather than clone. This is how one-of-a-kind pieces evolve. ▲

RON LAYPORT
is a self-taught furniture builder and a partner in a Pittsburgh-based advertising agency.



A TALE OF TWO TABLES

BY RON LAYPORT

Change a few details, and two similar tables can fit different needs with flair.

When my daughter burst into my front hall, the first words out of her mouth were, "Ooh, I want that table." She made it clear that she would be expecting one just like it in the near future. Needless to say, I obliged.

The table I built for Rachel (see foreground above and drawing) is basically the same concept as my original (see background above), but rendered and detailed with her uses and tastes in mind. It is *her* table, not just a clone of *my* table, yet the spirit of the original remains intact.

How the Design Evolved

When I designed the original table, I needed a surface to toss keys onto, a place for notes, mail, tomorrow's errands. This surface had to be shallow because of the location—a very narrow, high-traffic hallway in my home. I

wanted something light and airy, without large drawers that would fill up with unneeded stuff. I didn't want a bench to collect jackets and newspapers, or a high cupboard to visually choke off the space.

The surface would be viewed from the stairwell above, so it had to be quite unusual, as though the board itself were a piece of art. I had such a board which, as you might expect, was at the very bottom of my woodpile. This single board, a light tiger-maple plank with figure that looked like a series of reddish brown "spears" covering half its length, was to determine the appearance and the dimensions of the table.

The plank was riddled with auger holes, each centered on one of the spears. Created by Amish farmers who had tapped the tree at sugar-making time, the auger holes offered a multi-

colored record of a valued industry.

By stretching the board to its limits, using even the badly checked cut-offs for the breadboard ends, I was able to produce a 62-in. by 13-in. by 1¼-in. top. The rest of the design worked backward from that dimension. (If I were doing it again, I would make the top 1 in. thick to remove some weight—trial and error.)

I wanted the board to have a floating effect, with the base "falling back" visually, so I chose walnut for the legs. The dark color makes them appear to fade into shadow, as one might try to do if painting a picture of the table. The legs are delicate and pencil-thin, almost appearing to pierce the floor. Joining them is a cherry apron which ties into the brown-and-red color scheme of the spears on the top.

To offset the strong horizontal effect of the long top, I gave the table a

vertical push by designing a base that was taller than it was wide, allowing the top to overhang dramatically on both ends. This is reminiscent of the classic Shaker sewing table; I simply exaggerated the effect.

The front of the single drawer, floating in the shadows below the top, also came from one of the checked end cuts from the top board and repeats the "spear" figure. (See photo, above.) I further defined the drawer with a walnut "lining" around the drawer opening.



Cherry apron "bridges" the color gap between tiger-maple and walnut elements.

Again, I developed the final dimensions after starting with a single-board top. But this time the design problem was different. I wanted more stability so the table would be suited to a wider variety of uses, such as a sofa table or serving piece. So I widened its stance and added stretchers to stabilize the legs and give

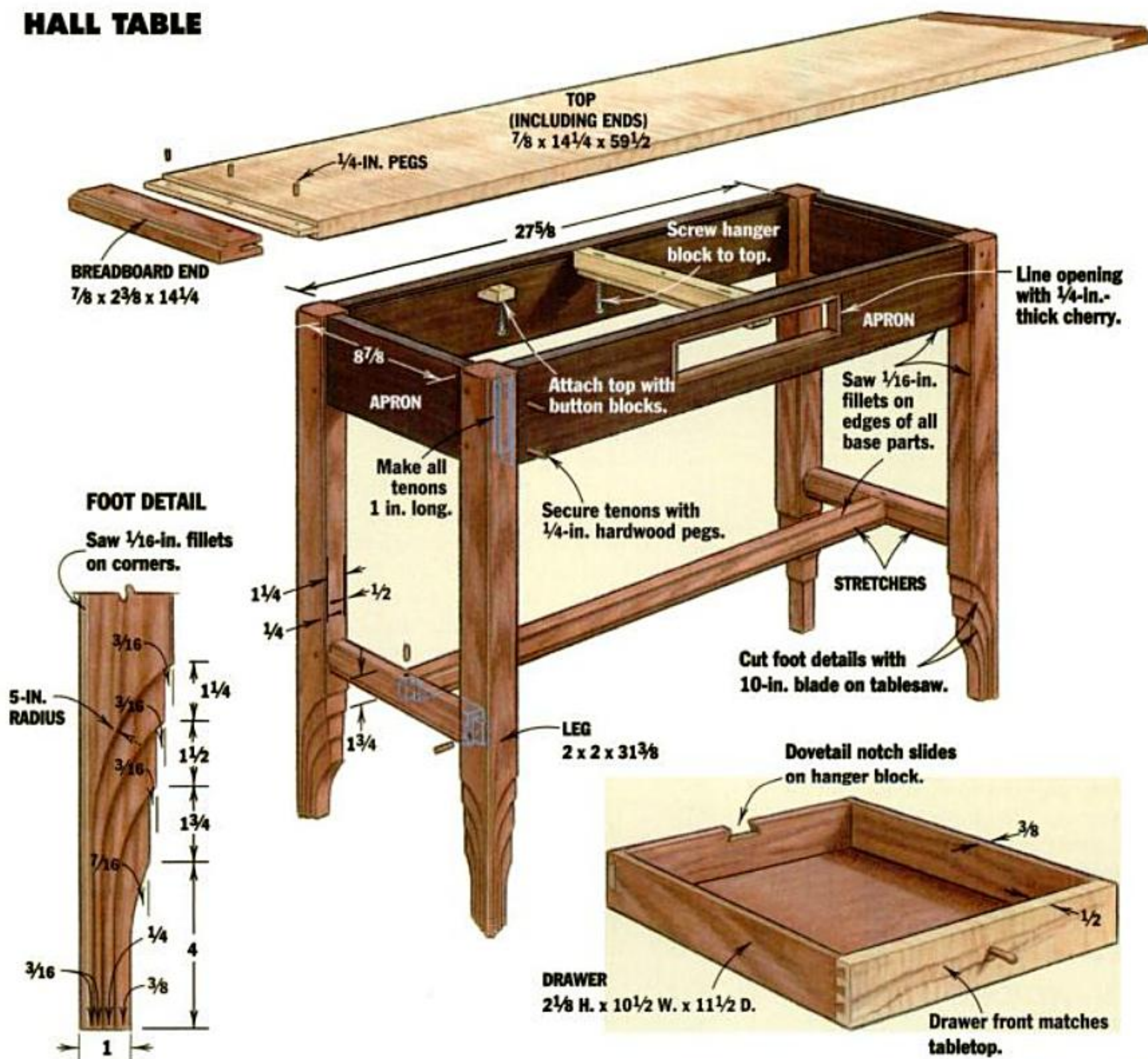
weight to the piece, both literally and visually. I also made the top thinner and visually lighter than on the original table. (See lead photo.)

I offset the increased visual bulk by

Modifications for Rachel's Table

At a glance, the second table is basically the same as the first, with its long overhangs, its multicolored rendering and its tiny drawer.

HALL TABLE



DRAWING BY BOB LAPOINTE

HOT LINSEED OIL FINISH



Author created foot details and fillets on legs, stretchers and breadboard ends with a 10-in. saw blade.



using a lighter wood (cherry) for the legs and stretchers and by adding details such as the shaped feet and the tiny fillets on the edges of the legs and breadboard ends. (See photos, above.)

I constructed both tables with pegged mortises and tenons. The drawers are solid cherry (except for the maple fronts), with hand-cut half-blind dovetails in front and a single, wide through-dovetail at each rear corner. The back of each drawer is notched to slide on a dovetail "hanger" strip screwed to the underside of the top, an idea borrowed from an old country work table I bought at a flea market.

I finished both tables with my usual hot linseed oil and tung oil finish. (See sidebar.) ▲

RON LAYPORT

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I love the look and feel of oiled wood. Oil finishes penetrate deeply to accentuate the grain and figure of wood, yet they don't build much thickness on the surface, so the wood still feels like wood. Here's how I apply my oil finish:

First I heat the linseed oil to about 120° in a pot on an electric hot plate, outside my shop. Heating the oil makes it penetrate deeper, giving the wood more depth and color. (*Caution: Hot oil is a fire hazard. Heat only over an electric burner outside your shop. Remove from heat before it begins to smoke.*)

I apply the oil liberally with a rag, using a big cast-rubber glove to protect my hand. I let the oil soak into the wood for at least 20 minutes, then wipe the surface completely dry with clean rags. To prevent any oil from leaching or "bleeding" out of grooves later, I use a shop vacuum to pull out any excess from those areas. (*Caution: Oily rags may burst into flame spontaneously if not properly disposed of. Put them in airtight metal containers approved for this purpose, or, hang them out to dry, then discard with your trash.*)

In all, I apply three coats of hot linseed oil, followed by two or three coats of room-temperature tung oil. I let each coat dry for at least a day before rubbing it out with 0000 steel wool. Then I give the surface one last rubdown with hot linseed oil to restore the sheen dulled by the steel wool. After a few days' drying time, I wax the piece with a carnauba-based

wax such as Trewax (available at many hardware stores).

One interesting benefit of the hot linseed oil finish is that after applying it, I can adjust colors and contrasts with non-grain-raising (NGR) stains. After I wipe the stain on, I can literally pull it back out with steel wool until only a slight blush remains, or I can remove the color entirely with another coat of hot oil. I create the feeling I want by leaving more color in the shadow areas or by downplaying an area. I can lighten other areas to catch highlights or to feature a certain aspect of a piece. There is no science to this; I discovered it by working my way out of a mess I had created.

I also found that hot oil will pull certain dyes out of the rags I use. An old cotton flannel shirt can add an almost imperceptible blush to the color of the wood. I'm always testing old clothes to find a "lucky" rag.

I never stain raw wood because I like the natural color effects I get with oil. I've found a couple ways to "cheat" on the color of the oil. Since linseed oil darkens with age when stored in containers that admit light, I keep supplies of oil of varying ages to use for different color effects.

Applying oil finishes does have a drawback, though—it's exhausting work. It takes two hours to oil and wipe down a major piece, and at least that much time to rub out each coat with steel wool. But it's worth the effort. By the time my five-coat oil production is finished, I have, in essence, created 50 years of patina.—R.L.



Author uses heavy rubber gloves to protect his hands when applying heated linseed oil.

CARVING LARGE BOWLS

Functional Folk Art Hewn Straight From the Log

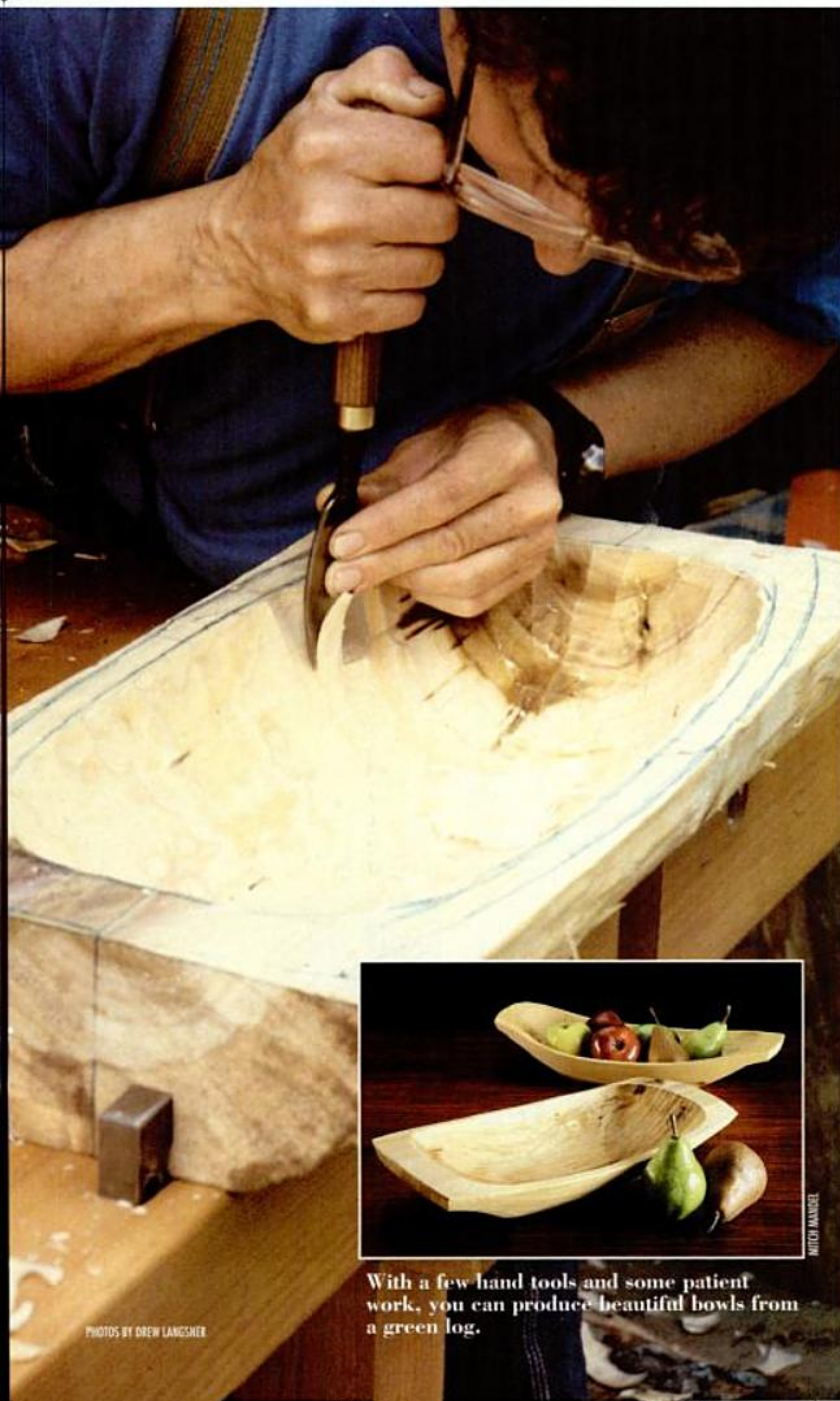
BY DREW LANGSNER

I first learned about Scandinavian bowl carving in 1977, when Swedish woodworker and teacher Wille Sundqvist visited our farmstead in the mountains of western North Carolina. Sundqvist grew up in rural Sweden, in an era when traditional woodworking was still a common activity. During the dark winter months when there wasn't much to do, Swedish craftsmen carved bowls for many purposes. In the kitchen, various bowls were used for cheesemaking, mixing and serving food. In the barn, large carved troughs served as feeders for the livestock. And on special occasions such as weddings and funerals, ornate bowls commonly shaped like large geese were used for serving homemade beer.

The bowls shown here are patterned after a traditional Scandinavian design and are sometimes called "dough troughs." Although you could mix bread or biscuit dough in them if you wanted to, they're more likely to be used as decorative serving vessels for salads, baked goods, fruit, or just for display.

I make my bowls straight from the tree by splitting a log and hollowing each half. Except for the chain saw I use to cut logs to length, I work entirely with hand tools.

Carving a bowl with hand tools is different than many other woodworking projects in that you don't work from a plan with set dimensions and a standard for the finished product. There are no square angles or perfect thicknesses, and there is only one flat plane—the bottom of the bowl. The final shape develops from the way the wood "works" and your perception of the form as you progress. Therefore, it's important to evaluate what you're doing throughout the project.



With a few hand tools and some patient work, you can produce beautiful bowls from a green log.

PHOTOS BY DREW LANGSNER

MITCH MANDER



Author uses an adze, hatchet, spokeshave and a variety of gouges to make his bowls.

Choosing the Wood

Most of my bowls, including the two shown on page 49, are carved from yellow poplar (also known as tulip), though I've also used horse chestnut (buckeye) and willow. In Scandinavia the most common bowl-carving woods are paper birch and aspen. Whatever your choice, if the wood will be in direct contact with food, it must have a fine-textured grain structure and should not have any noticeable taste or odor.

I prefer to use green wood, since it is far easier and more pleasurable to work by hand than dry wood. Also, dry wood often contains checks and splits when it is seasoned in large chunks. A cull log (one that will not produce quality sawn timber) is often fine for carving bowls.

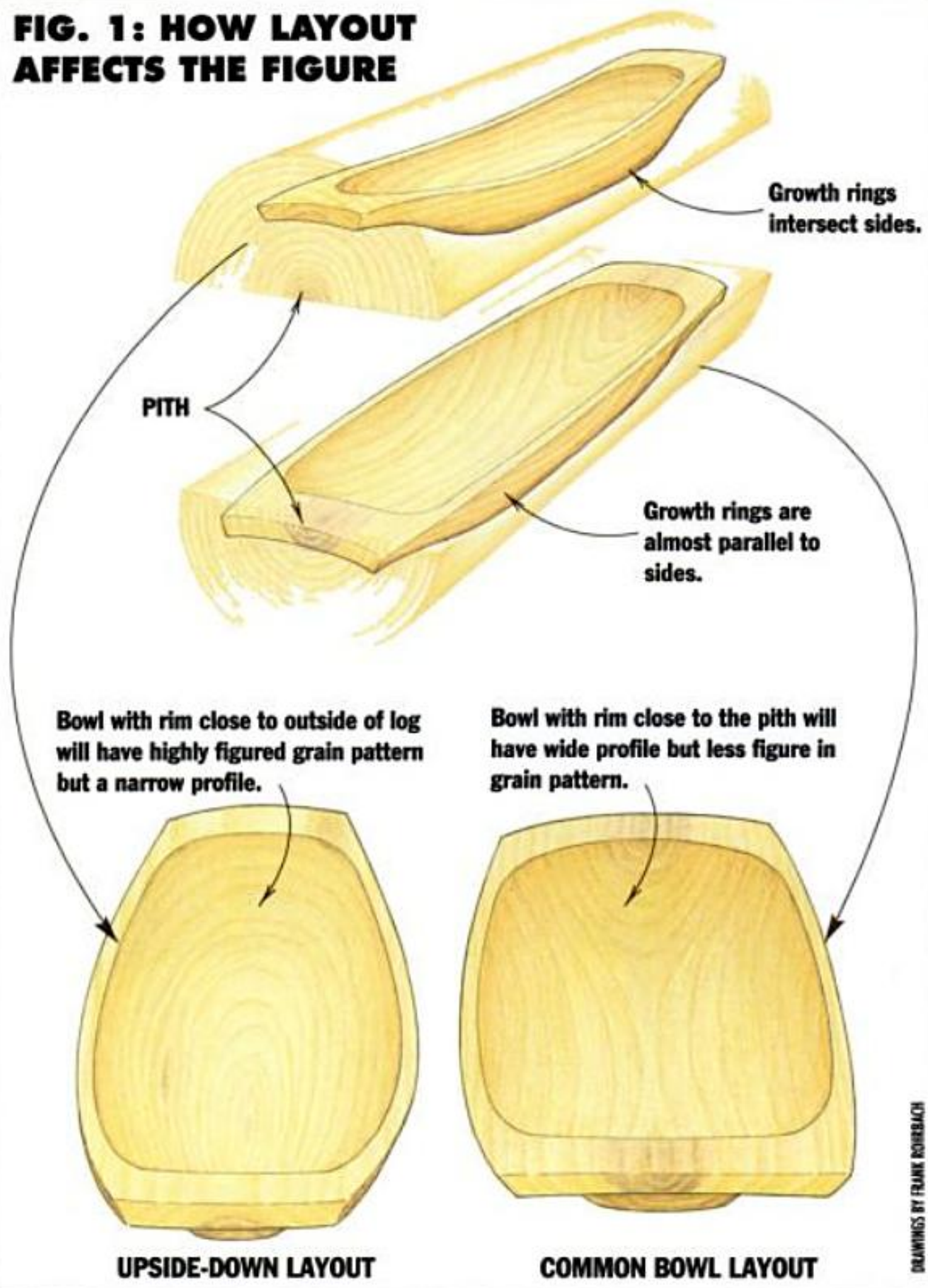
Getting Started

My bowls are about 7 to 12 in. wide, so I start with a log section about 8 to 13 in. dia. that has the clear wood needed for bowls. It's a good idea to saw the blanks a few inches longer than the intended bowl, leaving room for some trimming or extended handles at the ends.

The next step is to split the log through the pith at the center of the growth rings. I take some time to determine exactly what line to take through the pith, since I want to avoid defects like knots and hopefully produce two symmetrical pieces. Then I split the log with a single-blade ax and a heavy wooden club. (See photo, right.)

Most large carved bowls are formed with the bowl bottom tangent to the outer growth rings and the rim close to the split through the center. (See Fig. 1.) However, you can also make what I call an "upside-down" bowl, in which the bottom is located just beyond the pith and the rim basically follows the

FIG. 1: HOW LAYOUT AFFECTS THE FIGURE



outer growth rings of the log. This bowl has much more prominent grain pattern but a much narrower profile. For a first bowl, I recommend the standard configuration, with the rim near the center of the log.

Flattening the Blank

Once the log has been split, I flatten the bottom of the bowl blank



Author splits a log with a single-blade ax to produce the rough blanks for a bowl.

with a hewing hatchet and hand plane. Then, I hew and plane the top of the blank to remove at least 1/2 in.



When flattening the bowl blank, tilt the workpiece so you're cutting vertically and keep out of the path of the hatchet.

around the pith. Otherwise the finished bowl will usually crack as it dries. I like to pencil bottom and rim lines on the ends of the blank to help guide me during hewing.

Hewing is a two-step process. First, with the blank set on a stump at a comfortable height, I make a series of scoring chops with a hatchet, chopping with a hefty swing at about 45° to the surface. (See photo, opposite page.) After these scoring cuts, I remove the chips by hewing at an angle nearly parallel to the surface of the blank. Then I reverse the blank end for end and repeat the scoring and hewing process. I hew until I'm close to the lines I've drawn and the surfaces are approximately flat.

Hewing can be dangerous. To protect yourself, tilt the blank so the hewing action is close to vertical. Then with your legs out of the path of the hatchet, chop into the lower half of the blank, keeping the hand you're using to hold the blank behind the surface being hewn. (See photo, opposite page.)

After flattening the top and bottom with the hatchet, I use scrub and jack planes to finish flattening these surfaces. And I'm rather fussy about getting the bottom flat so that the bowl won't rock during the hollowing process. I place winding sticks (two pieces of wood that are exactly the same width) across the two ends of the bowl and sight across them to make sure the surface is flat.

Drawing the Rim Outlines

When the top and bottom are flat, I draw the rough outline of the exterior of the bowl on the blank. (See top photo at right, and Fig. 2.) When marking out the interior of the rim, I first draw lines about 2 in. in from the end lines. The exact distance depends on how wide the handles will be. Then I draw the sides about 3/8 in. in from the exterior side lines. Finally, I draw a pleasing radius where the interior end lines meet the side lines. Note: The ends of the bowl must be thicker than the sides, since the ends consist of short (and weak) end-grain fibers.

Hollowing the Bowl

I prefer to hollow the bowl now, because the block still has a flat bottom and perpendicular ends, which make it



Author draws the rough outline of the bowl along the top and sides of the blank.



Working on a low bench, author uses a Swedish hollowing adze to begin hollowing the bowl.



To determine the thickness of the bowl bottom, measure against a ruler set across the rim. The difference between the inside and outside measurements represents the thickness.

easy to secure to the bench.

I start cutting with a Swedish hollowing adze that has a 2 1/4-in.-wide blade (available from Country Workshops, 90 Mill Creek Rd., Marshall, NC 28753, 704-656-2280). I work with the bowl secured to a low bench, about 15 to 20 in. high. (See photo above.) This way, I can hold the adze handle with both hands and swing from the elbows rather than the wrists, resulting in greater accuracy. The cuts must always be from the



With the blank clamped to the workbench, author uses a bent gouge to refine the shape of the interior.

far side of the bowl block toward the center, so you're cutting downhill relative to the long wood fiber. But don't cut in at too sharp an angle, or the adze will stick in the wood and leave a very rough surface.

After chopping the surface from one direction, I move to the other end of the bowl and chop into my first cuts, lifting out large chips and leaving a rather smooth surface at the bottom of each cut. I continue these alternat-

ing cuts until the sides are about $\frac{1}{2}$ in. from the interior pencil lines and the bottom is about $\frac{1}{2}$ in. thick. When chopping near the ends of the blank, you should stop about $\frac{3}{4}$ in. in from the pencil marks. Otherwise, a misplaced swing of the adze could force you to lengthen the interior of the bowl.

The remainder of the hollowing work is done at a workbench, using gouges. (For more on carving gouges, see AW #5, November/December 1988.) I secure the block with dogs or opposing wedges. An alternative hold-down that works well is to put a small block of wood in the bottom of the bowl and then use a deep-throat bar clamp. (See photo, previous page.)

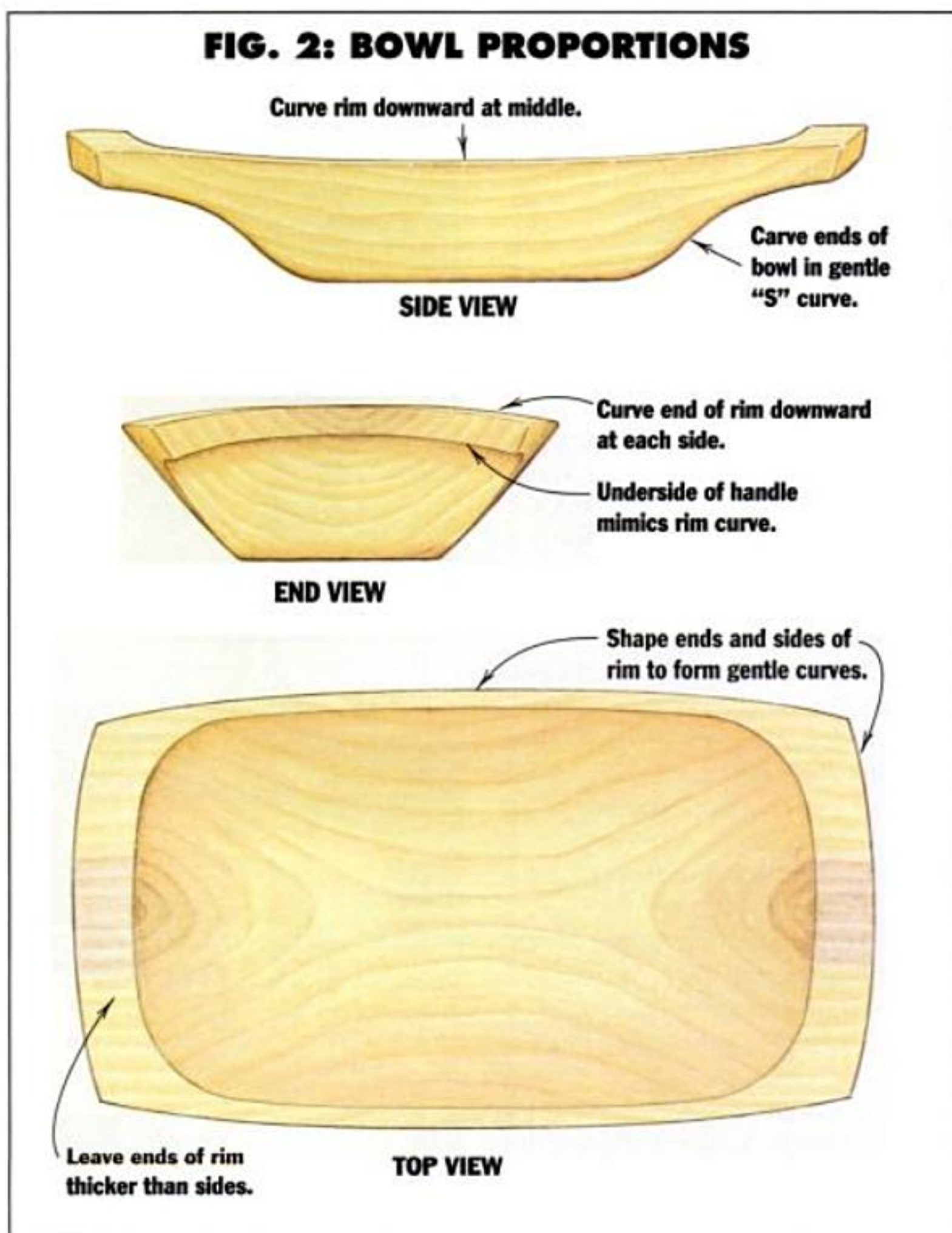
I like to start carving with a sturdy, double-hooped bench gouge that has a medium sweep and a $1\frac{1}{2}$ -in.-wide blade (available from Country Workshops, 704-656-2280). I cut radially (working toward the center from around the perimeter of the bowl) and carve from the rim toward the bottom. I generally slope the ends of the bowl at a gentle angle, about 40° to 50° from horizontal. At this low angle, cutting across the end grain is easier, and the bowl takes a graceful shape.

You can strike the gouge with a mallet to remove most of the wood, but it's best to make the final cuts by hand, using arm pressure and body weight to carefully control the gouge. You will gain some additional control and force if you place the fingers of your left hand just behind the cutting edge of the gouge. (See photo, previous page.)

Before the hollowing is finished, I return to the flat rim and carve the gentle curves shown in Fig. 2. I find it helpful to pencil the curving shapes I want on the ends and sides of the bowls, and then shape to the lines with a drawknife and spokeshave.

With both of these tools, you can optimize control and quality of cut by skewing the blade to the direction of the cut. This lowers the effective cutting angle and lets the tool shear rather than chop the wood fibers.

After shaping the rim, I do more work to refine the interior. At this point, I sometimes switch direction on the interior and gouge lengthwise with the long grain. This will leave a smoother surface compared to the



radial gouge work, which severs across the grain. However, with parallel cuts there is greater danger of cutting uphill into the wood fibers. Take long, shallow cuts to leave a nice surface.

Shaping the Sides

The interior is now done, so I can start shaping the sides with a hewing hatchet. I hold the blank at an angle on the chopping stump, grasping the upper end. (See photo, opposite page.) First I hew off the corners, and then I shape the ends, taking a slicing cut that leaves a smooth surface. I generally leave the ends about $\frac{3}{4}$ in. to 1 in. thick at the rim.

To get clean cuts here, you need to use a hatchet that is as sharp as a plane iron. Also, the side of the blade that registers against the bowl should have a very flat bevel or no bevel at all. A

hatchet with a rounded bevel will tend to glance off the wood.

When the ends are close to shape I begin hewing the sides, working from the middle of the bowl toward the ends. (See photo, opposite page.) I find it helpful to draw the exterior corners, so that I have an idea of the shape I'll make. I hew the sides until the walls are about $\frac{1}{2}$ in. to $\frac{3}{8}$ in. thick.

I refine the sides with a drawknife or spokeshave, securing the bowl upside down on the workbench with bench dogs.

As with hewing, you shave from the middle of the sides toward the ends. From time to time, check the thickness of the rim and sides. At this stage, the sides can be shaved to $\frac{3}{8}$ in. or even less. For strength, leave the rim a little thicker than the sides.

The exterior ends can be shaped

with a drawknife, spokeshave or gouges. I prefer to use gouges, because I like seeing the gouge cuts across the end grain on my finished bowls. I work with the long grain, cutting from the bottom of the bowl toward the handle end.

Carrying the fair curve along the butt of the handles (see Fig. 2) requires cutting directly across the end grain. I've found that a very sharp chisel pares across the end grain better than other tools. It also helps to use the chisel in a sideways, slicing direction.

Checking Proportions

The handles, sides, rim and interior of the bowl are now done, so it's time to take a close look at the proportions of the work. I examine the bowl for shape, uniformity of thickness, and surface quality. I view the shape from all angles: above, sideways, endways and even from the bottom. The goal here is to make sure the sides are symmetrical, the handles aren't warped or tipped to one side and the opposite sides of the rim are in the same plane. (See Fig. 2.) I also pay attention to the line formed by the junction of the sides and ends.

When I'm satisfied with the shape, I usually decide to refine the interior, sides and ends with spokeshaves and a 1-in.-wide shallow-sweep gouge.



To rough-shape the exterior of the bowl, first use a hatchet to hew the ends (above), then round the sides (below).



DRYING GREEN BOWLS WITHOUT CRACKS

The most frequent question I'm asked about carving bowls is, "how do you prevent them from cracking?" Indeed, most of the bowls that I carved 15 years ago cracked as they dried out. But cracking can almost always be prevented if you follow three rules:

1. Do not include the pith of the log in the rim or bottom of the bowl. A bowl that includes the pith will check radially from the center as it dries out.

2. Dry the bowl very slowly and evenly. Old-time bowl carvers and turners used to bury green bowls in a pile of green shavings, so that evapo-

ration from the surface would be slowed down. I find that I have even better drying control if the green bowl is placed in a plastic bag, then taken out once a day to air outdoors in a shady place for an hour or so. The wet bag is turned inside out to dry while the bowl is outside.

3. A thin, light bowl is less likely to crack than a thick, heavy one. As the bowl dries, the wood shrinks twice as much tangentially (tangent to the annual rings) as it does radially (from the pith outward). During drying, a thin bowl will warp into a new and usually pleasing shape; a thick bowl warps and cracks.—D.L.

Final Details

At this point, I set aside the bowl so the wood can dry and move. (See sidebar.) My bowls are quite thin, so they'll usually dry in a week or two. Once the bowl is dry, I can touch up and refine the surfaces with resharpened tools.

I prefer to let the final tool marks show on the surface of my bowls, but carvers generally sand bowls smooth. If you sand, it's important to raise the wood grain by wetting it before final sanding the bowl; otherwise, when the bowl is washed the fibers will lift, resulting in a fuzzy surface.

Finishing the Bowl

Bowl carvers have used a wide variety of surface finishes. Penetrating oils result in a warm, soft look, but some of them are toxic. That's a problem if the bowl will be in contact with food.

My Swedish friends traditionally used raw linseed oil. This results in a very attractive and food-safe surface, but it takes about six months to dry. Some bowl makers are now using a natural oil made from walnuts. Walnut oil is available in health food stores and has several unique qualities. It's perfectly safe (we think), and it doesn't turn rancid like other vegetable oils. Also, it's virtually clear. As with linseed oil, walnut oil cures slowly, but the curing process can be sped up to around one month if the oil is warmed before application. To avoid combustion, warm it in a double boiler, and have a lid ready to snuff out fires.

Bowls treated with walnut oil can be washed, though it's a good idea to re-oil them from time to time to maintain the protective coating. ▲



DREW LANGSNER

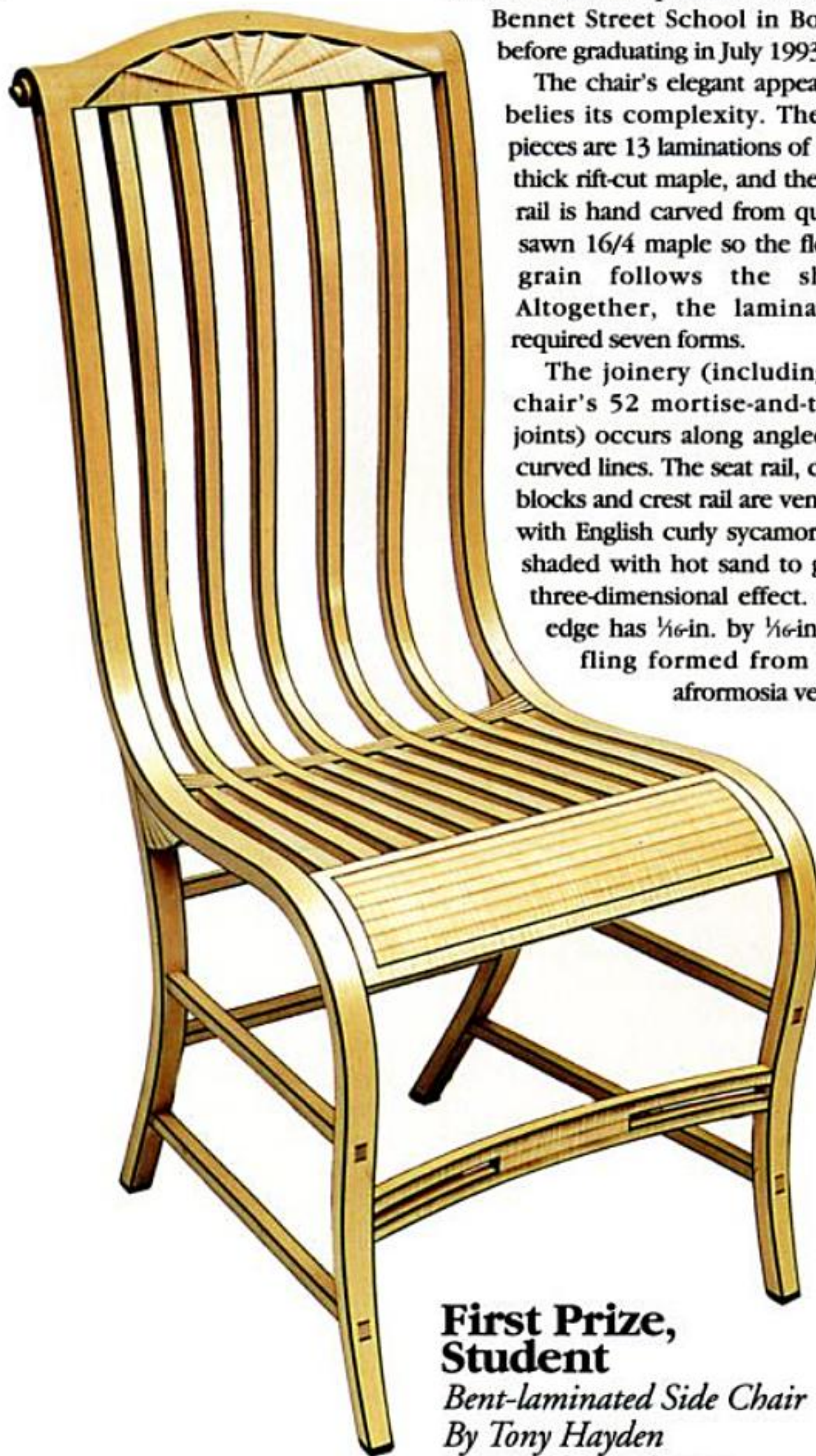
is the author of *Green Woodworking* (1987, Rodale Press, 33 E. Minor St., Emmaus, PA 18098) and runs the *Country Workshops woodworking school* in Marshall, North Carolina.

1 9 9 3 EXCELLENCE IN CRAFTSMANSHIP AWARD WINNERS

What attracts people to woodworking: The satisfaction of making something by hand? The pride in the finished piece? Yes, those elements are important, but there's something else as well, as we saw when interviewing the winners of our second annual Excellence in Craftsmanship awards. The predominant comment from these winners, pros and amateurs alike, was that they were drawn to the craft because of the medium itself—no other substance has the look and texture of wood, and no other craft offers the exhilaration you get from simply shaping a beautiful piece of wood.

It's clear our winners aren't alone in their reverence for woodworking or in the skill they bring to the craft. There were so many quality pieces among the nearly 1,000 entries in this year's competition that we were sorely taxed to separate the winners from the runners-up.

We congratulate those who placed in this year's contest and thank everyone who entered for inspiring us with the quality of their work. ▲



Tony Hayden was making a good living as a construction contractor, but he dreamed of making fine furniture. He had to face a decision: "I could struggle along as a woodworking novice or quit my job to learn the fine techniques of furniture making at a proper school."

This bent-laminated side chair leaves little doubt which path he chose. Using mostly hand tools, he made the chair over a five-month period at the North Bennet Street School in Boston, before graduating in July 1993.

The chair's elegant appearance belies its complexity. The side pieces are 13 laminations of $\frac{1}{16}$ -in.-thick rift-cut maple, and the crest rail is hand carved from quarter-sawn $16/4$ maple so the flecked grain follows the shape. Altogether, the laminations required seven forms.

The joinery (including the chair's 52 mortise-and-tenon joints) occurs along angled and curved lines. The seat rail, corner blocks and crest rail are veneered with English curly sycamore and shaded with hot sand to give a three-dimensional effect. Every edge has $\frac{1}{16}$ -in. by $\frac{1}{16}$ -in. purfling formed from dyed afrormosia veneer.

First Prize, Student

*Bent-laminated Side Chair
By Tony Hayden
Boston, Massachusetts*



First Prize, Professional

*Newport Blockfront
Chest of Drawers
By John W. Goff,
San Diego, California*

John Goff was a tool and die maker back in 1980 when he decided to take a few woodworking classes. "Right from the start woodworking came easy to me and I felt as though I'd found my gift," he says. So he embraced the craft and honed his skills by reading books and magazines, visiting museums and talking to professional woodworkers, who generously shared their knowledge.

Today, Goff is a pro himself, making pieces on commission, like this Goddard-Townsend, Newport-style, three-shell blockfront chest. Goff used Hawaiian koa wood for the chest. The wood's color and figure are a major departure from the muted tones traditionally seen on such a piece, but Goff argues that the old Newport craftsmen "used whatever beautiful wood they could, and would have used koa wood if it had been available." The drawer sides and interior parts are tulip poplar. The chest took about 250 hours to build and features hand-cut dovetails on the case and drawers.

A self-taught instrument maker, Mac Barnes was inspired to make violins by his love of country music and "the challenge of putting simple materials together to produce a great sound." Barnes has made 31 violins and prefers to give most of them to country musicians. (The Grand Old Opry presented one of his violins to country star Roy Acuff.)

This violin took about 300 hours to complete. The body is a Stradivarius style, but the carved head and inlaid scene were copied from a French-made "Duiffoprugcar"-style violin from the 1840s that is now owned by country musician Ricky Scaggs. The top is European spruce; the back, sides and neck are European curly maple and the fingerboard is ebony. Barnes used veneers of holly, olive, walnut, mahogany, zebra and dyed pear wood for the marquetry on the back.



First Prize, Amateur

*"Duiffoprugcar" Violin
By Mac H. Barnes III
Dale City, Virginia*



Second Prize, Professional

Custom Knife and Display Stand
By Yeung Chan
Millbrae, California



Knifemaking is practically a personal tradition for Yeung Chan, who started crafting knives as a young boy in China, where

he used them to make simple tools and wooden toys.

Chan, who now builds custom furniture and cabinets in the U.S., regu-

larly makes knives for carving, marking, and scraping chores in his workshop. But he decided to challenge himself by making this special 5-in.-long knife, which has a bird's-eye-maple handle and blade cover, and a curly-maple display stand. His motivation: "I never get tired of making beautiful things for people to enjoy seeing and using."

For the blade, Chan used an old industrial hacksaw blade that he ground to shape and polished by hand. The brass ferrules, which he shaped with a file, are dovetailed and epoxied into the handle and blade cover.

While Craig Stevens was attending the College of the Redwoods in California, James Krenov, the school's renowned instructor, told him that "By working in wood, you'll discover your own voice." Now graduated and making fine furniture, Stevens is proving the truth behind Krenov's words.

This cabinet is made of Norway maple veneered over bending plywood, with white oak legs and rails. The marquetry scene was inspired by the winter view from Stevens' kitchen

window, where black-capped chickadees perch in a hawthorn tree.

The chest features curved panels made with hand-sawn veneers and bent-laminated rails, and there's not a single 90° joint in the whole piece.

Second Prize, Student

"Chickadee-Walkabout" Cabinet
By Craig Vandal Stevens
Sunbury, Ohio



Second Prize, Amateur

Fire Engine Model
By Joseph W. Ramsey
Ormond Beach, Florida



Aself-taught woodworker, Joseph Ramsey has always leaned toward making models instead of furniture. It might have something to do with his fond memory of a hand-carved German beer wagon his father brought home when Ramsey was four years old.

"I'll work from a picture in a book to get ideas," says Ramsey. He scales the models by eye, based on the size of his materials because, he says, "When I start worrying about measuring for scale, it gets regiment-

ed. I'd rather work from the ideas in my head, with no rules to follow."

Ramsey made this intricate 24-in.-long fire truck over a period of 7½ months, working about eight hours a day in his modest shop. He uses common tools like files, tweezers and *nail clippers*, as well as a small drill press and bandsaw. He chooses woods like cedar, poplar and mahogany for their color. The detailed construction features full dashboard instruments, glass rear-view mirror and brass handrails.



**Third Prize,
Professional**
Bird's-eye-maple Bench
By Robert March
Princeton, Massachusetts

While studying architecture at Rhode Island School of Design 30 years ago, Robert March took some woodworking classes and got hooked. "In woodworking, you can finish a project in a couple of weeks with a tangible result, unlike architecture," says March. Today, he runs a woodworking shop that turns out "a little bit of everything" and he also teaches woodworking.

March made two of these 72-in.-long benches on commission, then decided to make a third one for himself because "I liked the strong design with its Arts and Crafts influence." The bird's-eye-maple bench, which took 200 hours to make, is mostly constructed with mortise-and-tenon joinery. The back splats are bent laminations and the ebony inlays fit in template-routed recesses.

After two years of engineering school, Kevin Riley realized he felt a stronger calling from a fascination with the colors and textures of wood. So he switched to the woodworking program at the Heron School of Art in Indianapolis, finishing up with a bachelor of fine arts degree.

Riley made this adjustable music stand using ebonyized walnut, bird's-eye maple, brass and stainless steel. The delicate vertical adjustment shaft

is made from bird's-eye maple epoxied to a $\frac{3}{16}$ -in.-dia. stainless steel rod, then carefully lathe-turned until the maple sheathing was just $\frac{1}{16}$ in. thick.

**Third Prize,
Student**
Music Stand
By Kevin Burke Riley
Capitola, California



JOSE MALTA

It took Benito De Teresa 1,500 hours to recreate Christopher Columbus' ship, the Santa Maria, in such painstaking detail. But to him "it was not a chore but a joy."

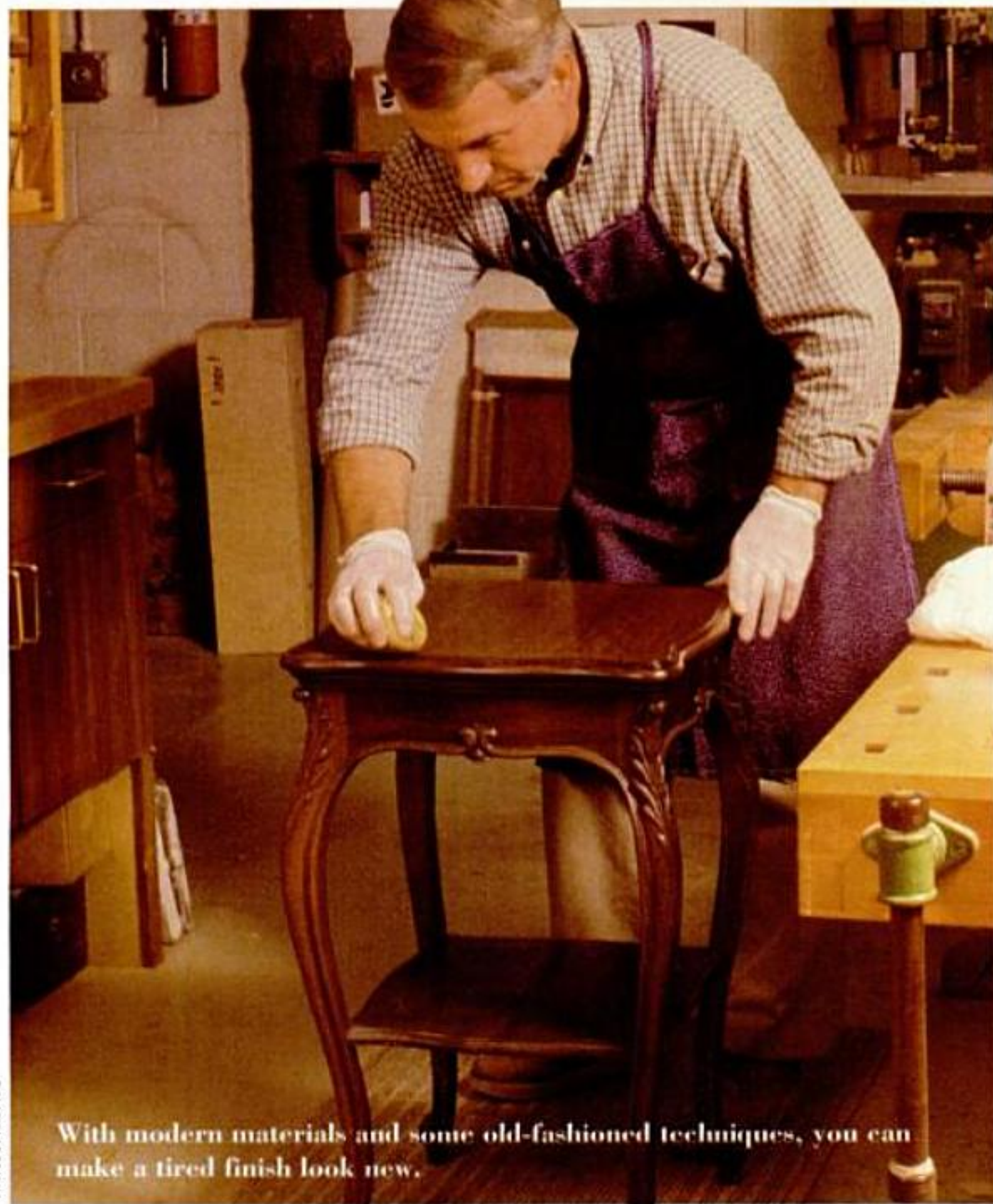
He cut the mahogany planking for this 53-in.-long operating model with a miniature table saw, stained the wood with ink to create an aged look and fastened it to the ship's frame

**Third Prize,
Amateur**
Model Sailing Ship
By Benito De Teresa
Mexico City, Mexico

with more than 2,000 hand-cut, tapered bamboo pegs. He made the brass hardware by hand, and the linen sails were embroidered and painted by his three daughters.

RESTORING THE FINISH

*Hold the Stripper! These
Gentle Steps Revitalize a Piece
While Preserving Its Value*



With modern materials and some old-fashioned techniques, you can make a tired finish look new.

BY FRANK KLAUSZ

A lot of furniture is ruined by removing the finish in an effort to restore the piece. Antique furniture—100 years old or more—is most valuable with its original finish; therefore, whenever it is possible, any work on an antique should involve bringing the finish back to life without taking it off. I call this process *restoring the finish*. And restoration doesn't stop with just antiques: Any type of furniture can

be restored without removing the finish as long as the wood below isn't damaged and most of the finish is intact. With some modern finishing materials and a little experience, you can preserve the original look of a piece in less time than it takes to remove the finish and start from scratch.

If you're just starting out, it's best to try your hand at restoring a common piece of furniture first instead of a valu-

able antique. Also, sometimes your only option is to remove the finish. I'll show you what to look for when deciding whether to take this step.

In addition to knowing when and how to restore a finish, it's important to know what *kind* of finish you're trying to restore, because there are different approaches for different finishes. The majority of antique furniture is finished with shellac or varnish, and occasionally with oil. Nitrocellulose lacquer has become popular only in the last 30 to 40 years, so you're most likely to find this finish on a more recent piece. That said, let's look at the options you have for giving an old finish new life.

Waxing

If the finish on a piece of furniture is dull but otherwise smooth and intact, all it may need is a good wax job to bring back the shine. Even a rough and lackluster finish can often be brought back to life with minimal work if you make your waxing a little more aggressive. I do this by using steel wool and paste wax, with brown-colored wax for dark woods and light-colored wax for lighter woods. The steel wool cleans and smooths the finish, and the color in the wax helps to hide small imperfections.

To wax a piece of furniture, dip a piece of 0000 steel wool generously into a can of wax and rub with the grain, using a sanding motion. As the wax dries, you'll notice the sheen change to dull. At this point, buff off the wax with a clean rag. Don't try to wax an area larger than about 1 ft. square at a time, since the wax dries quickly and becomes hard to buff out if you let it sit too long.

Cleaning

If the finish is dirty and dull, it needs to be cleaned prior to waxing. As long as there's no waxy buildup on the surface of the piece, cleaning can be done with any natural soap.

I use a little Murphy's Oil soap mixed with warm water. Dip a rag in the mixture and cover the area to be cleaned, scrubbing to remove the dirt. If the dirt is persistent, try letting the mixture soak for five to 10 minutes on the surface. Don't let the water touch any areas that may have bare wood or



The old shellac on this table leg (left) was rejuvenated by wiping and brushing the surface with alcohol.

Re-knitting the Finish

When you know what the finish is, you can *re-amalgamate*—blend back together—the surface with a solvent specific to that finish. Besides eliminating cracks and blemishes, this process will also rejuvenate an old finish that has darkened with dirt and age. (See photos above.)

loose veneer, or you'll risk damaging the furniture. Then clean the surface with a dry rag and let the piece dry completely—usually overnight. Now wax the finish.

If your piece is grimy and wax has built up, use a solvent to do the cleaning instead of soap. I use a product from Mohawk Finishing Products called Wax Wash (see Sources, page 60) which removes wax and dirt without harming the finish. You can use naphtha or mineral spirits instead, since both will dissolve the wax and not affect the finish. Soak 0000 steel wool with solvent, and rub gently with the grain. When all the wax is dissolved, wipe the piece with a clean rag and allow the surface to dry. Then apply wax as above.

Determining the Finish

If the finish is badly cracked and very rough, waxing or cleaning won't be enough. However, you may be able to "re-knit" (bring the cracks together) and smooth the finish with a chemical that will dissolve the finish. But before you use chemicals, you need to find out whether you're dealing with oil, shellac, varnish or lacquer.

Determining the Finish

Look at the finish. If it's oil, it won't have a surface thickness to it because oil is a penetrating finish. You can test for shellac, varnish and lacquer in steps by applying one of two solvents in an inconspicuous area on the piece to see if it softens the finish. First, test for shellac by rubbing a rag dampened in denatured alcohol on the surface. The shellac will soften instantly, but varnish or lacquer won't be affected. If the finish isn't shellac, test for varnish or lacquer by dampening an area in the same manner using lacquer thinner. Lacquer thinner will soften the lacquer, but won't soften the varnish.

Here's how to re-knit shellac, varnish and lacquer finishes:

To re-amalgamate shellac, apply denatured alcohol with a clean rag (an old T-shirt works well), making the surface as wet as possible without runs or puddles. Immediately wipe the surface lightly with a dry rag. The alcohol will soften the shellac almost instantly, so only work an area about 1 ft. square.

After one application, inspect the finish. If it isn't smooth, go back with the wet rag and soften some more of the finish, rubbing with enough pressure to force the shellac into the pores of the wood. Start with a circular motion to spread the shellac around, folding the rag often to keep the working surface of the rag clean. When the shellac is spread evenly over the surface, wipe lightly with the grain of the wood, using the same rag to smooth out the finish. For carved and hard-to-reach areas, use a small brush instead of a rag.

Let the piece dry for a few hours, then look at the finish. You may have some bare spots and areas of uneven sheen. If this is the case, sand lightly with 320-grit sandpaper, wipe off any dust, and brush or wipe on a few coats of 1½-pound-cut shellac.

To re-knit varnish and lacquer, I use a product from Mohawk called Amalgamator (see Sources) that contains a blend of solvents designed to gently soften the finish. This lets you

move the finish around to fill cracks and smooth the surface. (See photos below.) As the solvents in Amalgamator evaporate, the finish hardens back to its cured state. (Behlen makes a similar product called Qualarenu—see Sources.) While lacquer thinner will also dissolve lacquer, I don't recommend it for re-knitting a lacquer finish. Lacquer thinner is likely to soften too much finish and leave bare spots of wood.

To use Amalgamator, moisten a clean rag with the liquid and rub the surface with a circular motion to remove cracks, staying within a 1-ft.-square area. After the cracks are gone, keep wiping with the rag to soften the finish, and apply a little more pressure to spread the finish evenly over the surface. Finish by wiping with the grain to smooth the surface.

If you're not satisfied with the way the surface looks, you can sand lightly with 320-grit paper after it's dried for a few hours, then recoat with the original finish. However, I prefer to apply a modern padding finish.

Using Padding Finishes

Padding finishes—also called padding lacquers—are applied with a pad, as with French polishing, and produce a beautiful, fairly durable finish. (See side-

Using Padding Finishes

The cracked, scratched and dull varnish on this tabletop (above) was restored in two steps: first with a product that "re-knits" the surface, then finished with a padding finish.



The cracked, scratched and dull varnish on this tabletop (above) was restored in two steps: first with a product that "re-knits" the surface, then finished with a padding finish.



bar, page 61.) They work over all common types of finishes because they're mostly shellac, which makes them perfect for top-coating an existing finish or for spot repair, as long as the finish is clean and has been washed free of wax.

To make a pad for general finishing, squeeze together a handful of cotton (the type you find at pharmacies) and wrap it with a piece of cloth about



Author makes a finishing pad by wrapping layers of lint-free cloth around a handful of cotton.

10 in. wide and 24 in. long. This makes a pad about the size of a tennis ball. For larger surfaces such as a desk- or table-top, make the pad a little bigger. For spot repairs where you need to cover a small area with finish, a golf-ball-sized pad will give you pinpoint control.

The wrapping can be any cloth that doesn't stretch or leave lint. A well-washed bedsheet is good, or you can buy cloth designed specifically for padding. (See Sources.) Place the cotton at one end of the wrapping and roll the wrapping over the cotton, tucking in the edges as you go. Pull tightly to make a ball with many layers around the cotton. Pull out any wrinkles so you have a bottom surface that's smooth.

Before padding, make sure the surface of the finish is clean and free of

wax, then sand lightly with 320-grit paper and remove any dust. Use a tack cloth as a final step to ensure the surface is free of debris.

Now hold your pad bottom-up in the palm of your hand and saturate it with your padding finish, squeezing it lightly to force out any excess. Then cover the pad with another piece of wrapping, this one about 5 in. square, and wrap this tightly over the pad, twisting the corners of this outer wrap together. Again, check to see that there are no wrinkles at the bottom.

To begin padding, tap the pad a couple of times on the palm of your hand to disperse the finish. Holding the pad tightly, bring it down gently onto the surface you're working on, just like an airplane landing: The pad should skim onto the surface, and pressure should be light.

Work only a small section at a time, and start padding in straight strokes—with the grain—moving slowly without overlapping the previous stroke. (See drawing.) Don't worry about leaving bare spots for now; the next stage will take care of them. Pad right off the edge of the surface, then come back for the next stroke like an airplane landing. This initial padding 'conditions' the pad (makes it drier) for the next step and allows you to deposit a fair amount of finish quickly without pooling the finish in any one area.

When you've covered the surface with straight strokes and "conditioned" the pad (it takes me about 10 seconds for a 2-ft.-square area), pad in a succession of circular, slightly overlapping movements, as shown in the drawing. Keep steady pressure on the pad, and intersperse circular movements with

SOURCES

Padding finishes and other finish-restoration supplies are available from:

Garrett Wade, 161 Avenue of the Americas, New York, NY 10013, (800) 221-2942. (Behlen products)

CIRCLE #603

Mohawk Finishing Products, 5715 State Hwy. 30, Amsterdam, NY 12010, (800) 545-0047. (\$50 minimum order) CIRCLE #604

Star Finishing Products, 360 Shore Drive, Hinsdale, IL 60521, (800) 323-5390. (\$50 minimum order) CIRCLE #605

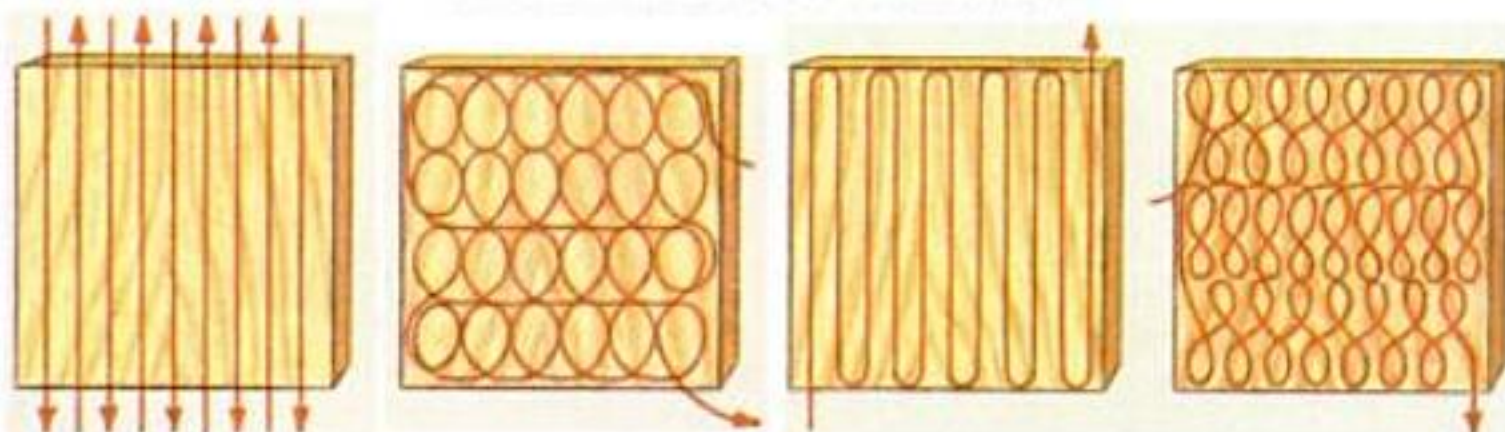
Woodworker's Supply 1108 North Glenn Rd., Casper, WY 82601, (800) 645-9292. (Behlen products) CIRCLE #606

occasional straight strokes. The idea is to build coat after coat—each coat whisper-thin—with circular actions, then every so often go back to straight strokes to even out the finish. Here's my rule of thumb: *When in trouble, go straight; when all is well use circles.* This means when the finish starts to build unevenly, use straight strokes, moving the pad off the edge at the end of each stroke to remove excess material and even out the finish. When the finish looks even, go back to building the finish with circular movements, keeping the pad on the surface. As the finish starts to build once more and leave ridges, even it out again with straight strokes, then continue padding circles.

Never stop the pad on the surface, or it will leave a mark. (If you get a mark, remember the rule: Go straight when in trouble.) When you want to stop, glide the pad off the surface like an airplane taking off. As you lay on very thin coats of finish, the pad will start to dry out and you'll need to apply more pressure on the pad to force the same amount of finish onto the surface. As the pad becomes too dry and fails to leave finish on the surface, open the outer wrapping and put a few drops of padding finish onto the inner pad. Wrap the pad tightly again, tap it on your palm, and continue padding.

When you think the finish looks good—which can take as little as five minutes on a 2-ft.-square area—

PADDING A FINISH



STEP 1: Use straight strokes with the grain, padding off the edge of the surface at the end of each stroke.

STEP 2: Then use a series of circular movements, from circles to loops to figure eights, to build the finish. Go back to occasional straight strokes to keep the finish even.

PADDING FINISHES: THE MODERN FRENCH POLISH

PHOTOS BY ANDY RAE



Padding finishes produce a high-gloss finish like traditional French polishing, but they're easier to use.

As an apprentice in my father's shop in Hungary years ago, I spent countless hours learning to master the art of French polishing—applying shellac with a pad. Today, there are modern materials called padding finishes, also known as padding lacquers, that produce the same glossy sheen, yet they're easier to use and offer better protection than traditional French polish. I use them to pad a finish on new wood, or when I want to restore an

old finish. (See main article.)

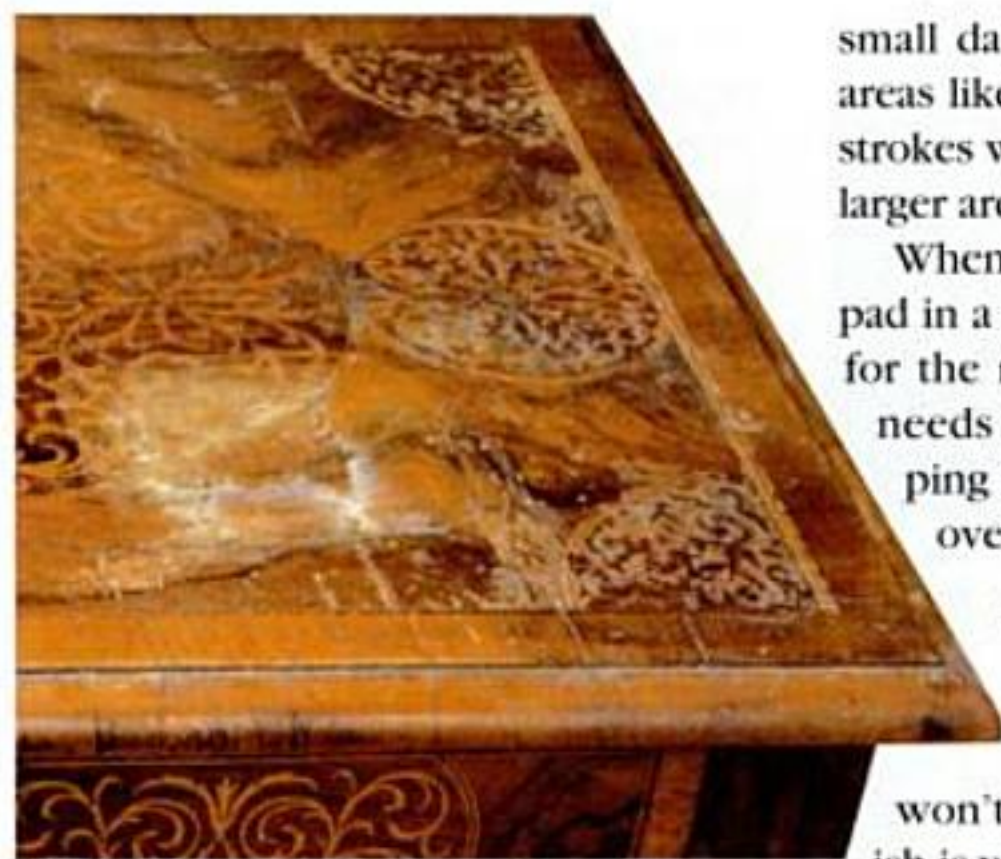
Unlike traditional French polish, where abrasives and lubricants are used to apply ultra-thin coats of shellac, padding finishes already contain lubricants like kerosene and paraffin oil, making them ready to go right from the bottle. This makes them easier to use than French polish. And some padding finishes have small amounts of nitrocellulose lacquer mixed in, which means you'll get a more water- and alcohol-resistant finish. I find that even those padding finishes without lacquer in them are less susceptible to water marks than traditional French polish.

There are three suppliers of padding finishes—Behlen, Mohawk and Star—(see Sources) and each sells an assortment of finishes with different characteristics such as color, drying time and the speed with which a finish can be built. I use several kinds from Mohawk and rely mostly on Rapid Pad for all-

around work, especially on flat surfaces where I want to build a finish quickly. When I'm applying a finish on the lathe, I use Qualasole because it dries fast, preventing my pad from sticking while the workpiece spins. For touching up the color of a piece, I use Lacover and mix powdered pigments with the liquid.

Most padding finishes are high-gloss, making them a poor choice if you want a low-luster finish, because the finish is so thin that rubbing down the sheen just produces a splotchy effect. But Star does sell one satin version called Satinol.

If you've never used padding finishes, try a slow-drying variety like Behlen's Ultra Qualasole, Mohawk's Golden Rapid Pad or Star-Lite from Star to get a feel for how these finishes work. Also, buy your padding finishes in the smallest quantities available because, being shellac-based, they have a shelf life of about a year.—F.K.



A finish is too far gone when there are deep and wide cracks, large areas of finish missing, and blemishes in the wood itself. The old finish must be stripped before restoration can be done.

increase the pressure and rub hard with straight strokes until your pad dries out. When the finish is smooth as glass and shiny as a mirror, you're done. To get into tight spots like carvings, use a small brush dipped lightly in finish, and build the finish with

small dabs from the brush. For small areas like edges, make occasional long strokes with the pad, then go back to a larger area and continue padding.

When I'm done padding, I store the pad in a glass jar with a tight lid, ready for the next job. The only thing that needs changing is the outer wrapping if it wears a hole. I have pads over 20 years old.

When to Strip the Finish

Sometimes the techniques I've described so far won't work, and removing the finish is your only option.

If bare wood is showing through wide cracks or missing finish (see photo at left), re-knitting the finish may not work. If there are deep scratches that penetrate the finish and mar the wood, or if the wood is discolored below the finish, you'll need to remove the old finish to get at the wood for repair. Either way, removing the finish is your only option.

I recommend using paint stripper to remove the finish rather than

scraping or heating, since strippers are less likely to damage the wood. (For more on paint strippers, see AW #22.)

Once you learn to restore a finish, you'll be able to retain the characteristics of an old piece of furniture instead of making it look like it was just made yesterday. After all, it takes many years for a piece to develop the grace that age gives it, and I believe that it's worth preserving that history whenever you can. ▲



FRANK KLAUSZ

makes furniture and restores antiques in Pluckemin, New Jersey. His video, Wood Finishing, is available from The Taunton Press (63 S. Main St., Box 5506, Newtown, CT 06470).

MIRROR, MIRROR, ON THE WALL...



PHOTOS BY MITCH MANDEL

This handsome mirror, which completes the bedroom suite (inset photo), can also hang on its own—the design is soft-spoken enough to complement a variety of furniture styles.



BY SCOTT COOPER

Since it takes a fair amount of time to design custom furniture, I try to get the greatest value from my work by developing ideas I may be able to use again. So when the time came to top off my cherry bedroom suite with a mirror, I decided to design a custom piece that would fit with the Chinese flavor of the set (see inset photo), yet be clean and simple enough to market later as a separate item. Depending on wood, texture and finish, this design could fit comfortably anywhere from Danish modern to

Southwestern Taos-style...perhaps even with Shaker furniture.

As with the other pieces in this suite, I used simple, traditional joinery. (See drawing.) Mortise-and-tenon joints connect the inner and outer stiles to the top and bottom rails, and thin cocobolo panels fit in grooves at both sides of the mirror. The only thing unusual is the way I make the rabbet for the mirror. More on that later.

Machining the Parts

I started by resawing the cocobolo panels and then laying them out with stickers between them and weights on top so they could stabilize before thicknessing. Then I milled some 4/4 cherry to $\frac{7}{8}$ in. and ripped my rails and stiles.

After that, I cut the pieces to the lengths shown in the Bill of Materials, and while the parts were still square, I cut the tenons and mortises. The mortises in the curved rail blank start out $1\frac{1}{4}$ in. deep, so they'll end up the proper $\frac{3}{4}$ -in. depth after the curve is cut. (See drawing.)

Two points to note here: The tenons on the inner stiles have no front shoulders. (See drawing.) This eliminates the need to chisel a curved shoulder where the stiles meet the curved top rail. (However, you still might have to pare a bit off the back shoulder later on, when you fit it to the curve of the top rail.) Also, note that the tenons on the top and bottom rails are haunched for greater strength.

After cutting the joints, I hand-sawed the inner curve on the top rail, then grooved all the rails and stiles with a slotting cutter in my router table. The versatile bit set I use has an arbor with various size cutters and bearings (#867, available from MLCS Ltd., Box 4053, Rydal, PA 19046, 800-533-9298).

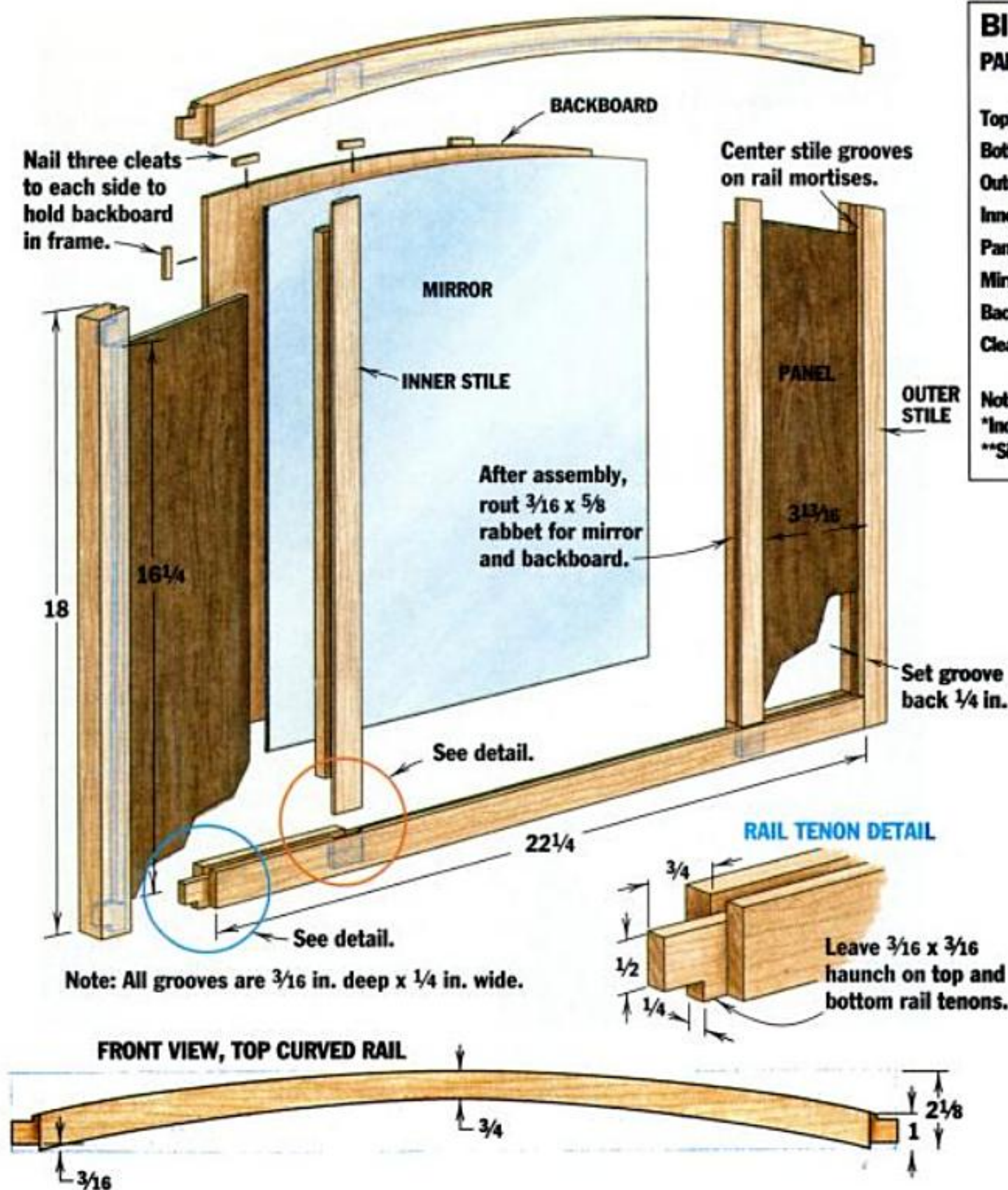
I hand-planed the parts, and then I was ready to cut the rabbet for the glass.

Cutting the Mirror Rabbet

I found that the easiest way to make the rabbet for the mirror was to rout it after assembly. I glued and squared the

The other pieces in the bedroom suite appeared in AW #33, #34 and #35.

HANGING MIRROR

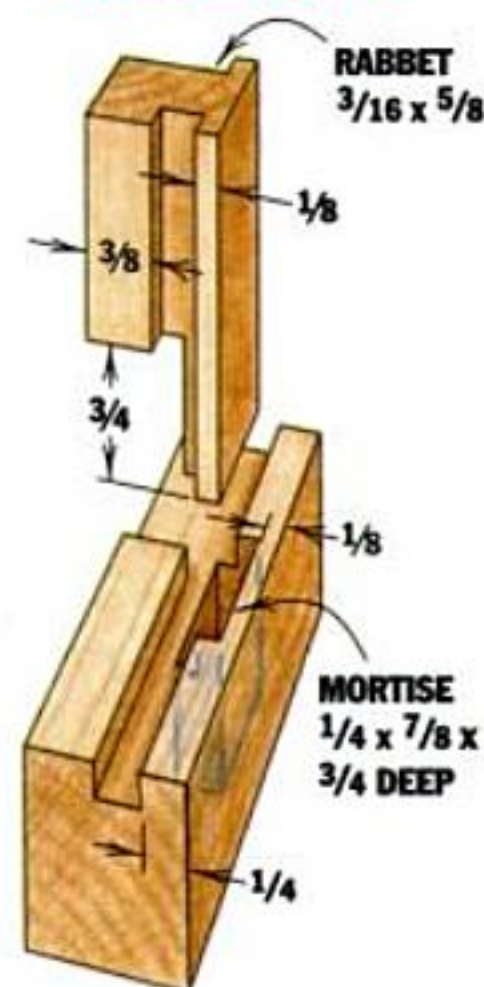


BILL OF MATERIALS

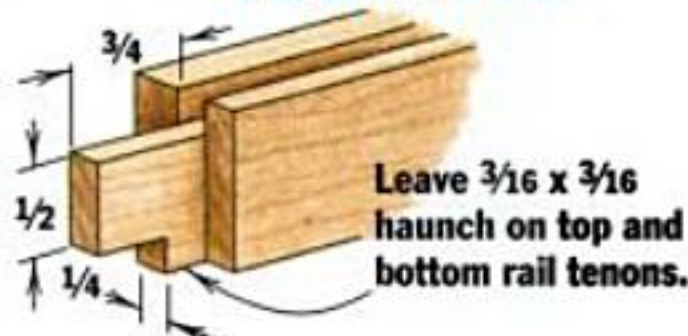
PARTS	QTY.	DIMENSIONS
Top Rail	1	7/8 x 2 1/8* x 23 3/4
Bottom Rail	1	7/8 x 7/8 x 23 3/4
Outer Stiles	2	7/8 x 7/8 x 18
Inner Stiles	2	3/4 x 7/8 x 18
Panels	2	1/4 x W. x L.**
Mirror	1	1/8 glass**
Backboard	1	1/4 plywood**
Cleats	6	1/4 x 3/8 x 1

Note: Where appropriate, length includes tenons.
*Indicates size of blank before curve is cut.
**Size to opening.

STILE TENON DETAIL



RAIL TENON DETAIL



DRAWING BY GLENN HUGHES

mirror frame, and once the glue had dried, I laid the frame face up on the router table and routed a 5/8-in.-deep rabbet to accept the 1/8-in.-thick mirror glass, the plywood backboard and the small cleats that hold the mirror and back in place.

Next, I traced the backboard from



Author routs the rabbet for the mirror by running the glued-up frame over a piloted bit in his router table.

the assembled frame, cut it out and took it as a template to the glass shop where I had the mirror cut. Then I bandsawed the outer curve on the top rail and outer stiles, taking care not to cut into the mortises.

As I did with the other pieces in this suite, I used an oil finish on the mirror frame. I applied several coats sparingly, to keep excess from soaking into the panel grooves and inner stile mortises, from which it would have oozed later on. Also, note that you need to finish the inner face of the rabbet as well, since it will be reflected in the mirror.

To finish assembly, I predrilled the cleats that hold the mirror and backboard in place and fastened them with

2D finishing nails set at an angle into the cleat and rabbet. Also, I installed the screw eyes about one-quarter of the way down in the sides of the stile rabbet, so the mirror would hang flat against the wall. A mirror that tilts too much will only show your chin whiskers and shirt front. ▲



SCOTT COOPER
is a professional cabinetmaker and designer in Hilltown, Pennsylvania.

AFTERMARKET TABLESAW GUARDS

*Protect Your
Hands Without
Compromising
Your Cuts*

BY KELLY MEHLER

Though I'd never use my tablesaw without a guard today, it wasn't always that way. Like many woodworkers, I found that the stock guard which came with my tablesaw was clunky and impossible to use for some cuts, so I removed it.

Then a shop accident that required surgery on my finger shocked me into realizing the importance of a blade guard. I tried an aftermarket guard and found it protected my hands and eyes while letting me make cuts like rabbets and dados that were impossible with a standard guard. And the payoff went beyond safety: My productivity increased because I could concentrate more on my work and worry less about losing a finger.

Aftermarket Advantage

To understand the advantages of aftermarket guards, first you have to look at the shortcomings of standard guards. Most stock guards combine a blade cover, a splitter and anti-kick-back fingers in a *single unit* that bolts behind the blade. While they provide safety, these guards compromise the use of push sticks and make it hard to cut narrow strips near the fence. And since you can't make non-through cuts with the splitter in place, you have to remove the *entire* guard to cut rabbets, dados or tenons.

In contrast, aftermarket guards attach to the saw table or an outfeed table and



Aftermarket tablesaw guards protect your hands during many types of cuts where a standard guard gets in the way.

have blade covers that are suspended over the blade. You can move the cover side to side to accommodate bevel cuts or when ripping narrow stock. Also, you can easily swing the blade cover out of the way when you want to use a cutoff box or other setup that requires more vertical clearance. Finally, since these guards operate with or without a splitter, you can use them when making non-through cuts.

Testing, Testing, Testing. . .

There are currently six aftermarket guards available. To see how they perform in a real shop setting, I tested each one on my Delta Unisaw, which is equipped with a Biesemeyer fence and outfeed and side extension tables. The specifics of my evaluations appear

on the following pages, but here are some general observations:

Mounting the Guard—It only takes a half hour or so to mount these guards to your saw, but note that some of the guards are designed to mount on a right-side extension table which isn't provided, so you'll have to add a table if you don't have one now.

Crosscutting Capacity—The Brett-Guard Model 10A-L offers limited crosscutting capacity to the left of the blade (just 17 in.), as does the Delta Uniguard No. 34-885 (25 in. on boards over 24 in. wide), so if you frequently crosscut long, wide boards, you might want to consider one of the other units.

Outfeed Tables—Whichever guard you buy, I strongly recommend you use it with an outfeed table to prevent wood from tipping and striking the guard as it leaves the saw table.

Using Splitters—Some of these guards come with splitters (your *only* protection against kickback) and those splitters vary in effectiveness. I'd recommend the Delta "disappearing" splitter (Model 34-868, \$46.60) for all these guards.

Recommendations—All the guards are well-made, but my favorite was the Biesemeyer. It was the lightest and the easiest to get used to using. In my opinion, the Delta Deluxe Uniguard is the best value for Delta saw owners because of its price and the fact you won't need to modify brackets or drill and tap holes to connect it to the saw.

Why Buy a Guard?

If you always work carefully and use push sticks when cutting narrow stock, you may not think you need to invest in a good guard. But safe sawing alone won't always protect you from an accident. If the wood kicks back in the middle of a cut, your hand can end up in the blade in a split second. A good guard will serve as a last line of defense between your hand and the blade. As I discovered the hard way, it's a cheap investment compared to the cost of visiting a hospital *after* cutting yourself. ▲

KELLY MEHLER is a custom furniture maker in Berea, Kentucky, and wrote *The Tablesaw Book* (1993, Taunton Press, Box 5506, Newtown, CT 06470).

BIESEMEYER BLADE GUARD

The Biesemeyer Blade Guard is a sturdy, lightweight unit that is easy to move around. The blade cover is suspended from a telescoping arm which bolts to the far edge of a right-side extension table (not included). (The guard also mounts to an optional floor stand, and an optional ceiling mount is also available.)

The metal-and-Plexiglas blade cover offers good visibility. You can move the blade cover side to side to position it precisely, but movement in this direction is limited to 8 in. and you have to walk to the end of the support arm to crank a fine-threaded adjustment screw. I found this tedious and eventually removed the crank screw entirely so I could simply slide the cover assembly by hand, then lock it in place with the knob on the telescoping arm.

The blade cover will lock 8 in. above the table to provide access for jigs and cutoff boxes. For cuts that



PHOTO COURTESY OF BIESEMEYER

The Biesemeyer blade guard is counterweighted, so it's easy to feed a board under the cover when starting a cut.

require more clearance, such as finger joints on the end of a long board, you can remove the blade-cover assembly and get 17 in. of clearance above the table, or slide out the cover assembly and telescoping arm for unlimited clearance.

The blade cover on the Biesemeyer has just 2¼ in. of inside clearance, making it the narrowest of all the guards. This limits its capacity for 45° bevel cuts so that if you try to cut 45°

Street Price: \$365 (Optional keyed alarm system: \$30)

Maximum Rip Width: 50 in. to right of blade (26, 38, and 62 in. available); unlimited left of blade.

- Splitter not included.
- Mounts to right-side extension table.

Biesemeyer Manufacturing Corp.

(800) 782-1831 CIRCLE #607

bevels on stock thicker than 1¾ in., the blade will cut into the cover. On the plus side, I found I could adjust the blade cover to safely rip stock as narrow as ⅝ in. (To cut such thin stock I had to use a tall, thin push stick.) Also, the blade cover is counterweighted, which makes it easy to feed the end of a board under the cover when starting a cut.

The Biesemeyer Blade Guard does not include a splitter or anti-kick-back pawls.

EXCALIBUR OVERARM BLADECOVER

The Excalibur Overarm Bladecover is made of steel and Plexiglas. It is suspended from a supporting arm made of steel tubing. The tubing clamps in a steel floor stand that bolts to both the end of a right-side extension table (not included) and to the floor, making this a rather permanent setup.

Like the Biesemeyer guard, the Excalibur blade cover is counterbalanced so it's easy to feed a board under the edge of the cover. You can lock the cover 7 in. above the table to gain access for measurements around the blade or to use a cutoff box. The blade cover adjusts left and right the whole length of the support arm, so you can move it far to the right to get it completely out of the way if necessary (though you'd need to disconnect the dust collection hose).

With a 3¼-in. inside width and 15-in. length, this blade cover is the longest of the lot. I had no clearance problems when I cranked the saw blade up to

full height at a 45° angle. Also, the profile of the cover rises at the back, which leaves plenty of room for a splitter (not included) and gives you a clear view of the area around the blade.

On the down side, the cover's extra width interfered with the miter gauge when crosscutting from the left side of the blade.

For dust collection, a flexible hose connects the blade cover to the hol-

The Excalibur guard offers dust collection, though it didn't prove very effective in tests.



PHOTO COURTESY OF EXCALIBUR

low support arm, which acts as a conduit for suction. (See photos.) As good as this may sound, I found that even my 5-HP dust collector only picked up a portion of the sawdust coming off the blade.



DICK BURROWS

Street Price: \$239

Maximum Rip Width: 50 in. right of blade; unlimited left of blade.

- Splitter not included.
- Mounts to right-side extension table and floor.

Excalibur Machine & Tool Co.

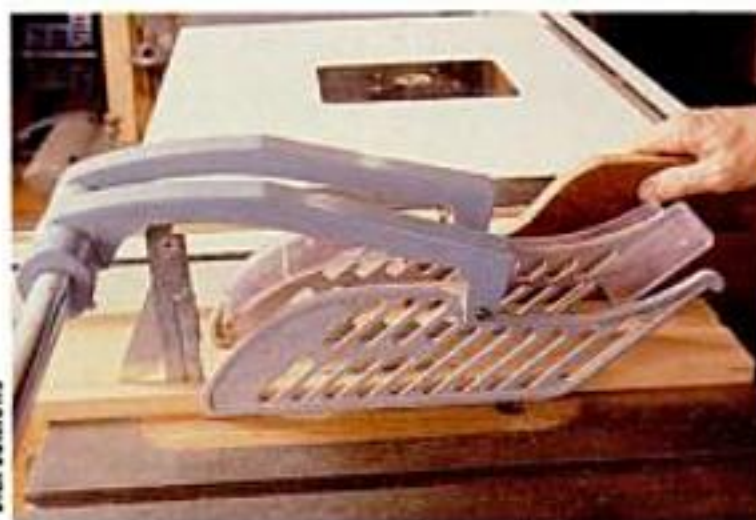
(800) 387-9789 CIRCLE #608

DELTA UNIGUARD NO. 34-885

The Delta Uniguard was designed in the 1950s for the Unisaw. The guard will work on other brands of saws, but you may have to drill and tap holes to mount the support arm to the saw table. The guard consists of a split blade cover suspended from a tubular support arm that attaches to the left rear corner of the saw table.

The split cover's two sides pivot independently on the arm, so they provide better protection than single-piece guards for making non-through cuts near the edge of a board: one side can ride on the stock while the other rides on the saw table. They can also guard close-to-the-fence operations, because the right side can ride up on the fence.

To adjust the blade covers side to side, I had to walk to the back of the saw and move the support arm sideways in the bracket. The split cover on the support arm rotates up and out of the way to provide 6 in. of clearance between the arm and the table—enough room to clear my crosscut box or let me change the blade. But with the blade cover



The standard Uniguard mounts to the left of the blade, limiting crosscuts but leaving more room to the right of the blade for push sticks.

down, when I crosscut with an auxiliary fence on the miter gauge, the fence tended to catch on the blade cover on the return stroke.

Because the guard's support arm is mounted to the left of the blade, it didn't interfere with operations where I needed to use my hands or a push stick to guide stock by the blade. But the left-hand mounting limits crosscuts to 25 in. on stock wider than 24 in.



Street Price: \$180

Maximum Rip Width: Unlimited right of blade; 25 in. left of blade on stock more than 24 in. wide.

• "Disappearing" splitter included.

• Mounts to saw table.

Delta International Machinery Corp.

(800) 438-2486 CIRCLE #609

DELTA DELUXE UNIGUARD NO. 34-976

Delta's new Deluxe Uniguard combines the split-cover design of the standard Uniguard with a longer, right-side support arm for greater rip and crosscut capacity. Its C-shaped support arm circles around any extension table and mounts to the rear of the saw table. Another bracket is supplied for optional support at the end of a right extension table. The guard is designed primarily to work with Delta's fence system and saws, but it should fit on most 10-in. tablesaws with minor modifications to the mounting bracket.

The split blade cover adjusts side to side by sliding the telescoping extension arm and locking it in place with a knob. Like the standard Uniguard, each side of the split blade cover lifts independently, so one side can stay on the table to protect your hands during non-through cuts.

The plastic cover offers good visibility, and the 2¾-in. inside width allows a 45° cut at full blade height.

I found it easy to flip the covers up and out of the way for making adjustments and measurements around the blade, or to change the blade. Also, the extension arm rotates up to give enough



Delta guards' split covers offer greater protection for non-through cuts: one side can ride on the work while the other stays on the table.



clearance for crosscut boxes, though I found it easiest to remove the extension arm and cover assembly entirely.

Since there's only 4 in. of clearance between the extension arm and the table, it's difficult to reach cutoffs after they pass the blade. To overcome this, you need an outfeed table and a push stick with a long, narrow nose (the push stick included with the guard will do).

A splitter with anti-kickback pawls is included, but it must be removed from the saw for non-through cuts. You can also mount the saw's power switch on the guard's support arm.

Street Price: \$230

Maximum Rip Width: 52 in. capacity right of blade; unlimited capacity left of blade.

• Splitter included.

• Mounts to saw table.

Delta International Machinery Corp.

(800) 438-2486 CIRCLE #609

BRETT-GUARD MODEL 10A-L

The Brett-Guard Model 10A-L was the first guard I tried some years ago. This guard is configured differently than the others; its blade cover is an 11-in.-square, 1 $\frac{3}{4}$ -in.-high box made of acrylic plastic. The cover is solid, with $\frac{3}{4}$ -in.-thick walls and a $\frac{3}{8}$ -in.-thick top.

The blade cover is suspended from two metal rods that attach to a "control unit," which has a crank that you turn to raise or lower the cover. The control unit mounts to a plate bolted to the saw's left or right extension wing. Left-side mounting is more common but provides just 18 in. of clearance between the blade and the control unit, limiting crosscutting capacity. You can install additional mounting plates to the right of the blade (cost: \$17.25) and behind the cover (cost: \$21.85), and quickly move the control unit to one of these other spots to perform most crosscutting operations.

I found that the blade cover affords great visibility and slides quick-



The Brett-Guard 10A-L's blade cover rides lightly on the workpiece to hold it down.

ly out of the way for blade setups.

The Brett blade cover doesn't adjust automatically to the thickness of the workpiece, as do most of the other guards. Instead, you have to manually readjust the height of the cover when you switch to wood of a different thickness. You can adjust the cover to hover above the blade, within $\frac{1}{8}$ in. of the fence, for ripping very

Street Price: \$246

Maximum Rip Width: Unlimited right of blade; 18 in. left of blade.

- Anti-kickback plate and splitter included.
- Mounts to saw table.

HTC Products

(800) 624-2027 CIRCLE #610

narrow work. Also, you can position the edge of the cover to help guide vertical stock against the fence

when cutting edge grooves.

The Brett-Guard includes a splitter that I had to modify to mount it to my saw. There's also a small, adjustable anti-kickback plate on the underside of the blade cover. The anti-kickback plate only works if the guard is mounted to the left of the blade, and I found that it didn't do much except put scratches in the workpiece.

BRETT-GUARD MODEL 10A-M50

The Brett-Guard Model 10A-M50 uses the same type of acrylic blade cover as the smaller 10A-L (see above), but its 5-in. by 11-in. cover is suspended from a telescoping support arm.

Although it's more expensive than

The Brett-Guard 10A-M50 has an optional auxiliary "panic" button mounted to the guard to stop the saw in an emergency.

the other blade guards, this unit impressed me as the most heavy-duty of the lot. Two metal rods and a vertical metal plate connect the blade cover to a control unit which is mounted at the end of the telescoping arm. The steel support arm bolts to a right-side extension table which is not included (or to the Biesemeyer back rail on my saw). Brett supplies mounting plates for most saws.

The control unit lets you adjust the blade cover sideways and vertically.

And the entire control unit/blade cover assembly will rotate up and out of the way, providing enough clearance to change a blade.

There's about 6 in. of clearance between the control unit and the saw table, which was plenty of room for my crosscut boxes.

As with the smaller Brett-Guard, you can position the cover to rip very narrow pieces and also use the cover to guide vertical stock against the fence.

The splitter and anti-kickback device are the same as on the smaller Brett-Guard, with the same limitations.

The Brett-Guard 10A-M50 offers an optional key-operated interlock that prevents the saw from starting unless the blade cover is in place, or locks up the saw to prevent unauthorized use. As part of the interlock system, you get a handy "panic" button that mounts to the control unit and cuts power to the saw in an emergency. Dust collector hookups are available.



Street Price: \$435

Maximum Rip Width: 53 in. right of blade (27 in. also available); unlimited left of blade.

- Anti-kickback plate and splitter included.
- Mounts to right-side extension table.

HTC Products

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CALENDAR

CALIFORNIA

SEMINARS

San Francisco: January 23. "Wood Furniture Design Trends in California." **January 24.** "Changes in Lumber Resources." Both part of Western Expo '94 at the San Francisco Merchandise Mart. (800) 487-8321.

SHOW

City of Industry: February 19-20. 21st Annual California Wildfowl Arts Festival. Carving competitions, demonstrations, exhibits, sales. Sheraton Industry Hills Resort, 1 Industry Hills Pkwy. (310) 427-2867.

CONNECTICUT

WORKSHOPS

Brookfield: January 15-16. Basic Router Technology: Bill Gundling. Stenciling: Susan Perry. Tool Sharpening: Bill Gundling. Bookkeeping for Artists: Barbara Bilderback. **January 29-30.** Trompe L'Oeil Ornamentation: Thomas Masaryk. American Furniture Survey: John Kovacik. **February 5-6.** Folk Painted Furniture: Carol Sue Roberts. **February 12-13.** Woodturning: Bill Gundling. Craft Marketing: Loretta Radeschi. Segmented Woodturning: George Radeschi. **February 19-20.** Woodworking Smorgasbord: Jere Osgood. Neo-Classical Decorative Painting: Victor DeMasi. Trompe L'Oeil Cabinets: Thomas Masaryk. **February 26-27.** Woodshop Designs: Bill Gundling. Brookfield Craft Center. (203) 775-4526.

FLORIDA

SHOW

Fort Myers: January 8-9. Southwest Florida Woodcarving Exposition. Harborside Convention Center, Edwards Dr. and Lee St. (813) 997-1914.

GEORGIA

SHOW

Duluth: February 25-27. The Atlanta Woodworking Show. Gwinnett Civic Center, 6400 Sugarloaf Pkwy. (800) 826-8257.

ILLINOIS

SHOW

Collinsville: February 11-13. The St. Louis Woodworking Show. Gateway Center, One Gateway Dr. (800) 826-8257.

WORKSHOP

Evanston: February 12 and 13. Shaker Oval Box Workshop. Shaker Traditions. (708) 869-0293.

INDIANA

SHOWS

Indianapolis: January 28-30. The Indianapolis Woodworking Show. Indiana State Fairgrounds, 1202 E. 38th St. (800) 826-8257. **February 11-12.** The Mid-American Lumbermen's Show. Indiana Convention Center. (704) 459-9894.

KANSAS

SHOW

Overland Park: February 18-20. The Kansas City Woodworking Show. Merchandise Mart, 6800 W. 115th St. (800) 826-8257.

KENTUCKY

WORKSHOPS

Berea: Scheduled according to demand. Adventure In Woods—Woodturning and/or Joinery Instruction: Jim Hall. (606) 986-8083.

MARYLAND

SHOW

Timonium: January 7-9. The Baltimore Woodworking Show. Maryland State Fair, 2200 York Rd. (800) 826-8257.

MASSACHUSETTS

EXHIBITION

Fitchburg: January 30-March 27. First National Exhibition of the American Association of Woodturners. Fitchburg Art Museum. (508) 827-4314 or (508) 345-4207.

WORKSHOP

Amherst: January 18-21. Wood Identification Workshop: Professor R. Bruce Hoadley. Introductory level. Limit 20 students. University of Massachusetts at Amherst. (413) 545-2484.

MICHIGAN

WORKSHOPS

Charlotte: January 14-15. Shaker Oval Box Workshop. The Home Shop, 500 E. Broadway. (517) 543-5325.

Marshall: January 21 and 22. Shaker Oval Box Workshop. Community Education, 701 N. Marshall. (616) 781-1264.

NEW HAMPSHIRE

DISCUSSION

Concord: January 22. "What is Good Design?" Sponsored by Guild of New Hampshire Woodworkers. New Hampshire Technical Institute. (603) 783-9912.

NEW JERSEY

SHOW

Edison: January 21-23. The New Jersey Woodworking Show. Raritan Center, 97 Sunfield Ave. (800) 826-8257.

NEW YORK

EXHIBITIONS

New York: Through February 27. "The Ideal Home: 1900-1920." Furniture, interiors and other media in the Arts & Crafts style. American Craft Museum, 40 W. 53rd St. (212) 956-6047.

Rochester: January 21-March 13. "Child's Play: Furniture for Children." Memorial Art Gallery, 500 University Ave. (716) 275-3081.

NORTH CAROLINA

SHOWS

Asheville: February 18-20. The Annual Grove Park Inn Arts & Crafts Conference and Antiques Show. Grove Park Inn. (800) 438-5800, ext. 8007.

Charlotte: January 14-16. The Charlotte Woodworking Show. Merchandise Mart, 2500 E. Independence Blvd. (800) 826-8257.

WORKSHOPS

Marshall: January 10-14. Ladderback Chairmaking. **January 24-28.** Windsor Chairmaking. **February 7-11.** Advanced Windsor Chairmaking. **February 21-25.** Ladderback Chairmaking. All taught by Drew Langsner. Country Workshops, 90 Mill Creek Rd. (704) 656-2280.

OHIO

EXHIBITION

Cincinnati: February 20-April 17. "The Arts & Crafts Movement in California: Living the Good Life." Cincinnati Art Museum, Eden Park. (513) 721-5204.

PENNSYLVANIA

EXHIBITION

Collegeville: January 28-April 4. Challenge V: International Lathe-turned Objects. Berman Museum at Ursinus College. (215) 844-2188 or (215) 489-4111.

SHOW

King of Prussia: February 11-14. The Furniture Market at Valley Forge. Valley Forge Convention Center in King of Prussia. (717) 245-9051.

WORKSHOPS

Quakertown: January 7-9 and 21-23; February 4-6 and 11-13. Woodturning: David Ellsworth. Limit 4 students. Fox Creek, 1378 Cobbler Rd. (215) 536-5298.

PUERTO RICO

SHOW

San Juan: February 11-13. Third World Expo for Woodworking Machinery, Tools and Related Products for the Caribbean, Central and South America. Roberto Clemente Coliseum. (809) 764-4242.

TENNESSEE

EXHIBITIONS

Gatlinburg: Through February 19. Selections from the permanent collection. **February 25-May 14.** "Myths: New Form, New Function," a national juried exhibition of artworks about myths and contemporary society. Arrowmont School of Arts and Crafts, 556 Parkway St. (615) 436-5860.

WORKSHOP

Smithville: January 25-April 12 (Tuesday evenings). Basic Machine Joinery: Mike Whiteman. Appalachian Center for Crafts, Rte. 3. (615) 597-6801.

TEXAS

SHOWS

Dallas: January 8-13. Santa Fe Furniture Expo. World Trade Center, 2100 Stemmons Freeway. (505) 984-7080.

McAllen: January 22 and 23. Eighth Annual Rio Grande Valley Woodcarvers Show and Sale. McAllen Civic Center, 1200 S. Tent. (210) 581-2448.

VIRGINIA

EXHIBITION

Williamsburg: January 14-June 1995. "Tools: Working Wood in 18th-century America." DeWitt Wallace Decorative Arts Gallery. (800) 447-8679, or (804) 220-7724.

WISCONSIN

SHOWS

Green Bay: February 19-20. Northeastern Wisconsin Woodworkers' Guild 11th Annual Spring Show. Port Plaza Mall, 1175 Port Plaza Mall. (414) 434-1288.

Milwaukee: February 4-6. The Greater Milwaukee Woodworking Show. Wisconsin State Fair Park, I-94 and 84th St. (800) 826-8257.

WORKSHOP

Stevens Point: January 24-25. Advanced Lumber Drying Workshop. University of Wisconsin at Stevens Point. (608) 238-7097.

CANADA

EXHIBITION

Victoria, B.C.: Through January 30. Vancouver Island Woodworkers Guild Juried Exhibition. The Maltwood Gallery, University of Victoria. (604) 384-3812.

SHOWS

Calgary: January 14-16. The Calgary Woodworking Expo. Roundup Centre. (403) 236-5834.

Mississauga, Ontario: February 25-27. The Canadian Workshop Show. International Centre. (416) 292-2784.

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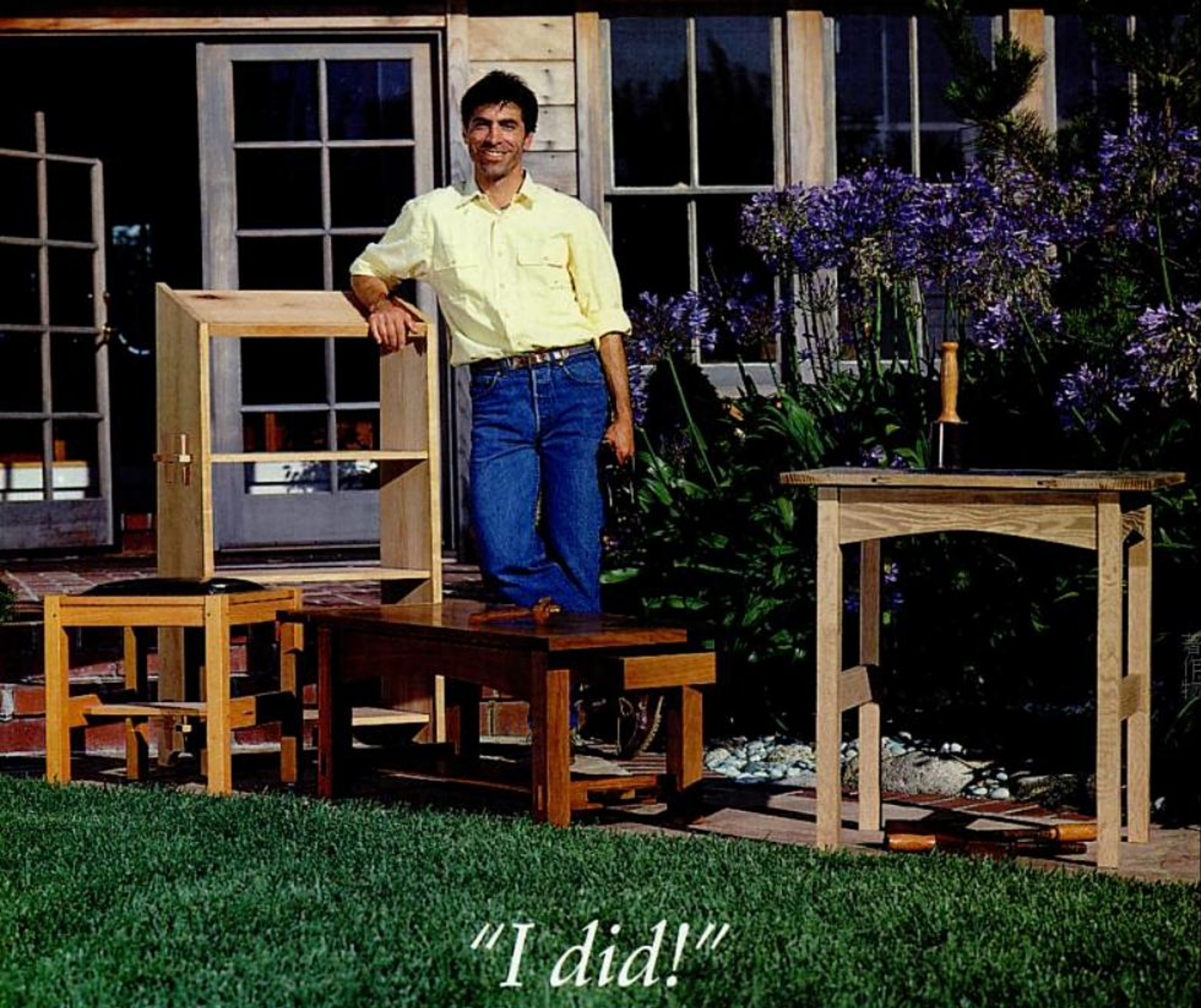
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WOOD FACTS

PHOTOS BY ELLIS WALENTINE



Flatsawn bigleaf mahogany



Quilted bigleaf mahogany



"African mahogany" (khaya)



"Philippine mahogany" (lauan)



Santo Domingan mahogany

MAHOGANY

BY DICK BOAK

SPECIES

Primary Species: *Swietenia macrophylla* (Bigleaf mahogany—Central and South America)

TRADE NAMES

Of the woods traded under the name, "mahogany," only those belonging to the genus *Swietenia* are true mahoganies (sometimes sold as "genuine," "New World" or "American" mahogany). Of true mahoganies, only bigleaf mahogany (*S. macrophylla*) is still widely available commercially. It is often denominated by its country of origin (Brazilian mahogany, Peruvian, etc.). The common trade name, "Honduras mahogany," is inaccurate—overharvesting has greatly depleted that country's supply. The finest mahogany, Santo Domingan (*S. mahoganii*, also called "Cuban" or "Spanish" mahogany), has also been overharvested and is no longer generally available except as windfalls after hurricanes. Though similar in color, "African mahogany" (*Khaya* spp.) and "Philippine mahogany" or "lauan" (*Shorea* spp.) are not true mahoganies.

APPEARANCE

Mahogany is usually bright reddish pink when freshly cut, but it turns to a coppery reddish brown with exposure to light. Denser wood tends to be darker. The sapwood is cream-colored and thin. The large, plentiful pores are often plugged with white or yellow deposits of gum, calcium or sulfur. The grain is

primarily straight and plain, though rarer logs of rippled, curly, fiddleback, blistered, striped, mottled or quilted wood occasionally appear. Flatsawn planks sometimes display darkly swirled growth rings, while quartered planks are nearly devoid of grain lines.

WORKABILITY

Mahogany is prized for its stability and workability and is ideal for most woodworking applications. It glues well and is easy to work with both machine and hand tools, although its interlocked grain is susceptible to tear-out. Its resiliency helps it resist dents.

TECHNICAL PROPERTIES

With a specific gravity range of 0.54 to 0.64 (34 to 40 pounds/cubic ft.), mahogany is a light- to medium-density hardwood. It dries well, moves very little in service and is durable enough for most outdoor uses. Although the thin sapwood is vulnerable to boring insect attack, the heartwood is fairly resistant. Quartersawn stock is preferred by pattern makers because of its high stability. Mahogany requires pore filler for a smooth finish, though unfilled oil finishes produce an attractive leathery "pigskin" color and texture. Mahogany takes dark stains beautifully and can be finished to a high luster.

USES

Mahogany is used for fine furniture, paneling, boats, caskets, musical

instruments, pattern making, carving and signs. Highly figured logs are especially prized for sliced veneer.

SIZES

Mahogany trees can grow more than 100 ft. tall and up to 12 ft. in dia. Typical boards are 6 in. and wider and 8 ft. and longer, and are available in all standard thicknesses from 4/4 through 16/4.

SUSTAINABILITY

Mahogany is not currently banned from import or export, though it has been recognized as potentially endangered by the CITES (Convention on International Trade in Endangered Species) Treaty of 1992. Certification, restrictions and boycotts are currently under discussion.

AVAILABILITY

Mahogany is readily available in several grades, mostly "FAS" and "select-and-better," through larger lumber dealers and wholesale mahogany specialty companies.

COST

Though prices for mahogany vary greatly, the wholesale price range (100 bd. ft. and up) of 4/4 FAS grade is \$2.25 to \$3 per bd. ft., with premiums for longer, thicker and wider stock. Quartersawn wood and figured wood are also priced substantially higher. ▲

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CIRCLE NO. 6 ON PRODUCT INFORMATION FORM

JUST FINISHING



BY MICHAEL DRESDNER

There's an old saying that a finish is only as good as the surface it covers, so it stands to reason that preparing that surface properly is a vital part of the finishing process. There are two primary steps to preparing new wood for finishing: filling or repairing surface defects; and sanding the piece to a uniform surface. And if you plan to use water-based finishing materials, you'll need to add a third step—raising and de-furring the grain. Here's how to handle each step:

Repairing Surface Defects

By the time your wood has gone from plank to project, it has probably picked up some battle scars. This damage is usually in the form of dents, gouges and scratches. Since wood fibers aren't torn when wood is dented, you can usually repair dents by steaming. (See photo.) In the case of gouges, the wood fiber is either torn or missing. Gouges—along with pinholes, knot cracks, and other voids—must be filled or puttied. Scratches, which are really extended gouges, may be sanded if they are shallow enough. Otherwise you'll have to putty them like other gouges and possibly touch them up later to camouflage them. (For more on touch-ups, see "Just Finishing," AW #28.)

To steam a dent, put two or three drops of clean water directly into the dent with a clean touch-up brush or a toothpick. Let the water soak in for about 30 seconds, then add another drop to form a dome over the dent.



Before sanding and finishing, repair dents by steaming them with a hot iron and a damp rag. Fill gouges and deep scratches with wood putty (above right), then sand the putty flush with the surface.

PHOTOS BY LARRY FREEDMAN

PREPARING WOOD FOR FINISHING

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Place a damp cotton cloth over the wood and press the tip of a hot iron over the dent. (For very small dents, I often use a burn-in knife or a soldering iron instead.) The damp cloth will protect the surrounding wood from scorching. Check the spot frequently, applying heat until all the water has dried. If the dented fibers don't respond fully on the first try, you may have to repeat the process. If the "dent" is still there after your third attempt, it's probably a gouge.

Filling gouges is a much simpler process. Use a commercial wood putty (either solvent-based or water-based) or make your own filler by mixing some fine sawdust with glue, epoxy, or even shellac. Press the putty into the gouge with a putty knife or an artist's palette knife, leaving it slightly raised from the surface. Let the putty dry (you'll know it's ready when you can't make a depression in it with your thumbnail), then sand it flush with the surrounding wood.

It's not always possible to find the

exact color of commercial putty you need, but you can make a custom-colored putty by mixing two or more colors together or by adding some touch-up powders. (For sources, see AW #28.) Store your custom-colored putty in a small jar with a tight lid; baby food jars work well for me.

If the putty becomes dry or crumbly in the container, add a few drops of the appropriate solvent to restore it to a workable consistency.

Smoothing the Surface

Once you've repaired the defects, the next step is to make the surface uniformly smooth so it will accept stains and finishes evenly. Uniformity is critical. You can use a plane, a scraper or sandpaper—or some combination of these—as long as you use only one of them to produce the final surface. Further, if you choose sandpaper, it's important to sand your entire project to the same grit. If you don't, the coarser surfaces will appear duller under a clear finish and

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Note: Fine Woodworking (Nov/Dec '88, No. 73, pg. 65) recommends high alternating top bevel (ATB) thin kerfs and large blade stiffeners for smoothest cuts on radial saw, etc.



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JUST FINISHING

darker when stained with pigmented stains. (Dye stains are somewhat more forgiving.)

What should your final grit be? This depends on both the type of wood you've chosen and the type of finish you plan to apply. Very hard, dense woods, such as rock maple and ebony, require finer sanding to eliminate scratches that would be invisible on a coarser wood such as mahogany. Finer sanding is also required for thin finishes (such as oil finishes) because they will show more scratches than thicker finishes (such as lacquer or polyurethane). If I were putting an oil finish on ebony, I'd sand the wood to 600 grit. But if I were spraying lacquer on mahogany, I'd stop at 180 grit.

A good general sanding schedule that will work for most woods and finishes starts with 80-grit paper, moves up to 120 grit, and then on to 180 grit. (To shorten the sanding process, many craftsmen first remove machine marks

with planes and scrapers, then begin sanding with 180-grit sandpaper.) Make sure to sand out all scratches from the previous grit before moving to a finer grit. If you are planning to apply shellac, lacquer, polyurethane or varnish, you can stop right here, brush off your project, wipe off any remaining dust with a tack cloth and get ready to apply your finish.

Raising and De-furring the Grain

If you are going to use a water-based stain or top coat, or an oil finish, you'll want to raise and de-fur the grain before finishing. This will minimize the grain-raising effect of these types of finishes. Here's the procedure I recommend:

After sanding your entire project to 180 grit, sponge all the wood surfaces liberally with plenty of clean water. After 20 to 30 seconds, wipe excess water off the wood with a clean absorbent rag or some paper towels,

and let the piece dry overnight.

When the wood is completely dry, it should feel rough to the touch. Sand it lightly with 220-grit paper—either by hand or with a power sander—just enough to smooth out the roughness and “de-fur” the raised grain. If you sand too hard or use sandpaper that is too rough, you risk cutting into fresh wood where the grain was not raised. On turnings, carvings and other hard-to-sand areas, use nylon abrasive pads, which conform to shapes better than sandpaper. As soon as the wood feels smooth, stop sanding, tack off the dust with a tack cloth, and get ready to apply your stain or finish. ▲

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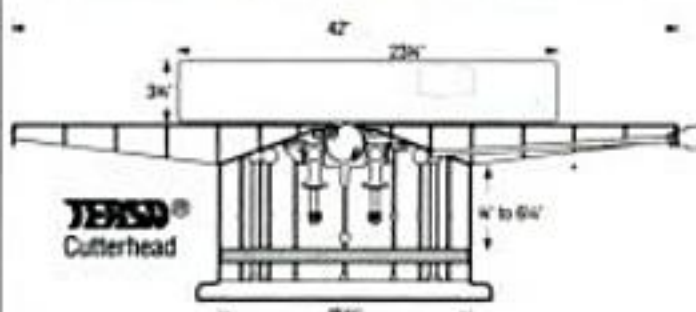
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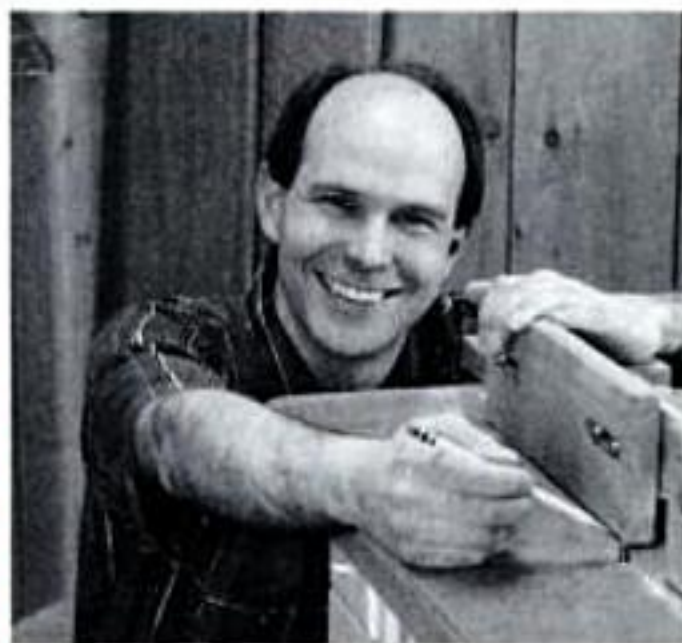
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EXAC-T-GUIDE AND SAW TRAX



There's no shortage of aftermarket jigs that make portable power tools function as stationary tools. Usually these gadgets don't compare to the real thing. But Exac-T-Guide and Saw Trax are two notable exceptions. Both let you use your portable circular saw or router for a wide variety of tasks.

Exac-T-Guide resembles a giant aluminum T-Square. The "T" section of the "square" rides in a guide channel you screw to the long edge of a 4-ft. by 8-ft. plywood work surface, while the blade of the "square" has a carriage that holds a circular saw or



Exac-T-Guide

router. To rout or saw parallel to the guide channel, you push the square and carriage assembly along the channel. To rout perpendicular to the guide channel, you move the carriage back and forth along the "T-square's" blade. (The circu-

New Capabilities for Your Circular Saw and Router

TESTED BY AW EDITORIAL STAFF

lar saw won't work in this position.)

Our tests showed Exac-T-Guide was excellent for sawing and routing sheet goods up to 4 ft. wide, 8 ft. long and $\frac{7}{8}$ in. thick. Because you move the saw or router instead of the workpiece, you can cut a full sheet of plywood or MDF in half the space you'd need with a tablesaw. You can even mount a biscuit joiner in Exac-T-Guide for locating a row of biscuit slots accurately.

But we found it was awkward to cut to widths over about 30 in. (unless you flipped over the workpiece), because you have to stretch too far. Also, when routing dadoes across the tool's width, we had to clamp down the free end of the "T-square" blade to keep it from deflecting and skewing the cut.

Accessory stops (\$44) are available for making accurate stopped cuts or for repeating patterns like simulated raised panels. (Price: \$229)

Aim Tools Inc., 91 Niagara St., Toronto, Canada M5V 1C3, (800) 665-0900. CIRCLE #601

The Saw Trax Professional model is designed to work like a sliding compound-miter saw, but it's more versatile since you can crosscut parts up to 35 in. wide and rout across panels 33 in. wide. (The less expensive Standard model crosscuts to 21 in. and routs to 19 in.)

To use Saw Trax, you just clamp a



Saw Trax Professional

circular saw or router in the steel carriage, which slides smoothly on two heavy-gauge steel tubes. You can use the fixture for straight, miter and compound miter cuts.

An accessory rip carriage (\$119) lets you mount the saw perpendicular to the guide tubes and lock it in place. Then, to make long rip cuts, you feed the stock under the blade as you would when ripping on a radial arm saw.

We found that Saw Trax crosscut accurately, although it's difficult to see the blade while cutting, since it's under the carriage. Using the rip carriage was a bit awkward because the carriage and guide tubes prevent you from placing your hands in a convenient position to control the stock.

Saw Trax is great for routing dadoes or grooves across a workpiece. We could rout perfect tapered sliding dovetail grooves just by placing paper shims under one end of the workpiece to tilt it slightly. (Price: Professional model \$329.95, Standard model \$269.95)

Tinkerdell Inc., Box 1170, Kennesaw, GA 30144, (404) 424-3046. CIRCLE #602

PORTER-CABLE

100	7.8 HP ROUTER	309
310	PRODUCTION LAMINATE TRIMMER	142
312	PRODUCTION OFFSET LAMINATE TRIMMER	154
314	4 1/2" TRIM SAW	137
315-1	7 1/4" BUILDERS SAW	118
330	SPEED BLOCK FIN SANDER 557 AFT. RBT	47
332	QUICKSAND 5" RNDM ORB W/STIKIT PAD	63
332K	332 W CASE & 100 SHEETS PAPER	80
333	QUICKSAND W/HOOK & LOOP, DUSTLS	73
333K	333 W CASE & 50 SHEETS PAPER	99
334	QUICKSAND W/STIKIT, DUSTLESS	73
334K	334 W CASE & 100 SHEETS PAPER	99
345	SAW BOSS 6" CIRCULAR SAW	104
347	7 1/4" FRAMERS SAW 15 AMP, 10.25 LBS	126
351	3" X 21" BELT SANDER	142
352	3" X 21" BELT SANDER W DUST BAG	147
352VS	3" X 21" VS BELT SANDER W DUST BAG	158
360	3" X 24" BELT SANDER W DUST BAG	182
361	3" X 24" BELT SANDER	174
362	4" X 24" BELT SANDER W DUST BAG	188
363	4" X 24" BELT SANDER	184
410	UNDERSCRIBE LAMINATE TRIMMER	150
411	MITER FOLD LAMINATE TRIMMER	165
447	7 1/4" FRAMERS SAW W BRAKE 15 AMP	138
505	1/2 SHT FIN SANDER	118
550	NEW POCKET CUTTER	178
556	BISC JOINER W/CASE & TILT FENCE	177
556K	SAME AS ABOVE W 1000 BISCUITS	199
690	1 1/2 HP ROUTER W 1/4" & 1/2" COLLETS	130
690K	690 W CS, EDGE GUIDE, & TEMP GD KIT	169
9690	1 1/2 HP ROUTER W/CASE	139
691	1 1/2 HP "D" HANDLE ROUTER	143
693	PLUNGE BASE ROUTER, 1 1/2 HP	164
695	SHAPER TABLE W 1 1/2 HP ROUTER	213
696	SHAPER TABLE	123
2620	3/8" VSR DRILL, 0-1200 RPM W/CHK	99
5008	DOVETAIL TEMPLATE	76
5009	MORTISE & TENON JIG	44
5116	OMNI JIG	258
6031	PLUNGE ROUTER BASE	74
7116	NEW 24" OMNI JIG	289
7310	LAMINATE TRIMMER, 5.6 AMP	88
7312	OFFSET TRIMMER	122
7319	TILT BASE TRIMMER	99
7335	5" RANDOM ORBIT SANDER, VS	128
7335K	7335 W CS, DUST EX SYS, 100 SHTS PPR	172
7336	6" RANDOM ORBIT SANDER, VS	132
7336K	7336 W CS, DUST EX SYS, 100 SHTS PPR	179
73333	RANDOM ORBIT DUST EXTRACTION	24
7518	3 1/4 HP FIXED BASE ROUTER-5 SPEED	262
7519	3 1/4 HP FIXED BASE ROUTER-1 SP	228
7536	2 1/2 HP FIXED BASE ROUTER	197
7537	2 1/2 HP FIXED BASE "D" HNDL RTR	207
7538	3 1/4 HP PLUNGE ROUTER-1 SPEED	228
7539	3 1/4 HP PLUNGE ROUTER-5 SPEED	262
7549	TOP HANDLE BAYONET SAW	143
7649	BARREL GRIP BAYONET SAW	143
7700	NEW 10" LASERLOC MITER SAW	338
9118	PORTA PLANE KIT W/CASE, CRBD BLD	203
9314	4 1/2" TRIM SAW KIT	148
9315	7 1/4" BUILDERS SAW KIT	138
9345	SAW BOSS 6" CIRCULAR SAW KIT	122
9637	TIGER SAW VAR SPD RECIP SAW KIT	138
9647	TIGER CUB RECIP SAW KIT	115
9840	CRDLS DRILL KIT W 2 BAT, CS KYLS CK	158
9853S	SAME AS ABOVE BUT W 2 BATTERIES!	177
97310	LAMINATE TRIMMER KIT W 4 BASES & CS	189
97751	1 1/2" VS, 2 SPD HAMMER DRILL KIT	145

Panasonic

EY6181CRKW	NEW PREDATOR 9.6V CORDLESS KIT VSR W/ KYLS CHUCK, 22 STAGE CLUTCH W/2 BAT, CASE & CHGR	162
EY6100CRKW	NEW PREDATOR 12V CORDLESS KIT VSR W/ KYLS CHUCK, 22 STAGE CLUTCH W/2 BAT, CASE, & CHARGER	192

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BT3000S	10" TABLE SAW WITH STAND	529
AP12	12" PORTABLE PLANER	390
TSS220	8 1/2" SLIDE COMPOUND MITR SAW	438
TS-380	15" MITER SAW	360
OSS450	OSCILLATING SPINDLE SANDER	174
D38VSR	3/8" VSR DRILL, 4.0 AMP, 0-2500 RPM	59

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28-180	BENCH TOP BAND SAW	167
31-080	1" BELT 5" DISC SANDER	93
31-460	4" BELT 6" DISC SANDER	129
33-060	NEW SIDENICK 6 1/2" FRAME & TRIM SAW	369
37-070	NEW 6" VS BENCH JOINTER	249
40-560	16" SCROLL SAW, 2 SPEED	179
50-075	DUST COLLECTOR SWEEPER, 3.4 HP	245
50-175	NEW KICKSTAND PORTBL WORK STAND	169

Milwaukee

0406-1	9.6V KYLS CDLS DRILL KIT W 2BAT, CS	169
0407-1	SAME AS ABOVE BUT 12 VOLT	174
6010	1 1/2 SHEET FINISHING SANDER	119
6017	1 1/2 SHEET FINISHING SANDER W BAG	55
6125	5" RANDOM ORBIT SANDER	112
6126	6" RANDOM ORBIT SANDER	115
6256	TOP HANDLE JIG SAW	145
6365	7 1/4" CIRCULAR SAW, 13 AMP	120
6400	NEW 10" MITER SAW INC 80T CARR BLD	249
6507	VAR SPEED SAWZALL W BLADES & CSE	143
6508	SAME AS 6507 BUT W PERMANENT CRD	143
6527	SUPER SAWZALL W BLADES & CASE	169
6528	SAME AS 6527 BUT W PERMANENT CRD	169

AEG

TXE150	6" VS DUST FREE RANDOM ORBIT SANDER W/VELCRO PAD	\$144
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DEWALT

DW100	3/8" DRILL, 0-2500 RPM, 4 AMP	68
DW318K	4.5 AMP HVY DTY JIG SAW KIT W CS	144
DW360	7 1/4" SAW W BRAKE	139
DW430	3" X 21" DUSTLESS BELT SANDER	164
DW431	3" X 21" DSTLS BELT SANDER VAR SP	182
DW610	1 1/2 HP ROUTER, 9 AMP	147
DW614	1 1/4 HP PLUNGE ROUTER	143
DW615	1 1/4 HP PLUNGE ROUTER, VAR SP	158
DW624	3 HP HVY DTY PLUNGE ROUTER	245
DW625	3 HP HVY DTY PLUNGE RTR, VAR SP	275
DW682K	BISCUIT JOINER KIT W 100 BISCUITS	224
DW705	12" COMPOUND MITER SAW	358
DW944K2	9.6V CORDLESS KIT W 2 BATTERIES	148
DW945K2	12V CORDLESS KIT W 2 BATTERIES	168

HITACHI

D15DFKBE	9.6V, CRDLS DRILL KIT W 2BAT & CS-KYLS	148
DS103KRAE	12V CORDLESS DRILL KIT W 2 BAT	189
D10VC	3/8" DRILL VAR SP, REV, 3.2 AMPS	59
SV12SA	4 3/8" PALM GRIP SANDER	49
SB75	3" X 21", 2 SPEED BELT SANDER	136
SB10T	4" X 24", 2 SPEED BELT SANDER	180
CJ69V2	TOP HANDLE JIG SAW W CASE	156
P20SB	3 1/4" PLANER, 3.4 AMP	89
TR5	LAMINATE TRIMMER	92
TR9V	VAR SPEED PLUNGE ROUTER, 1 1/4"	149
TR12	3 HP PLUNGE ROUTER	184
MR2V	3 HP VAR SPEED PLUNGE ROUTER	224

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1021VSR	3/8" 1100 RPM DRILL	99
1194VSR	1 1/2" VSR, 2 STAGE HAMMER DRILL	140
1272	3" X 24" BELT SANDER	175
1272D	3" X 24" DUSTLESS BELT SANDER	183
1273	4" X 24" VS BELT SANDER	182
1273D	4" X 24" DUSTLESS BELT SANDER	195
1273DVS	4" X 24" VS DUSTLESS BELT SANDER	199
1370DEVSK	6" VS DSTLS RNDM ORB SNDR KIT	259
1581VS	TOP HANDLE JIG SAW, VS	144
1581DVS	SAME AS ABOVE BUT DUSTLESS	167
1582VSC	CLIC BARREL HANDLE JIG SAW, VS	144
1582DVS	SAME AS ABOVE BUT DUSTLESS	167
1604	1 3/4 HP ROUTER	134
1608	LAMINATE TRIMMER	64
1608U	UNDERSCRIBE TRIMMER	117
1609K	INSTALLERS KIT WITH 3 BASES	173
1609KX	DELUXE INSTALLERS KIT W 4 BASES	197
1613	1 3/4 HP PLUNGE ROUTER	163
1613EVS	2 HP VAR SP PLUNGE ROUTER	183
1614	1 HP PLUNGE ROUTER	127
1614EVS	1 1/4 HP VAR SP PLUNGE ROUTER	143
1615EVS	3 1/4 HP VAR SP PLUNGE ROUTER	243
1655	7 1/4" CIRCULAR SAW	109
3050VSRK	9.6 V, VSR CRDLS DRILL W 2 BAT, CS	134
3202DVS	5" VS DUSTLESS RANDOM ORBIT	98

SKIL

77	7 1/4" WORM DRIVE CIRCULAR SAW	145
1605-02	BISC JOINR W CS, 100 CLAMPLESS BISCUITS, & GLUE SYS	125
1875	2 1/4 HP EVS PLUNGE RTR W BIT SET	174
2736-04	12V CRDLS KIT W FREE 15 PC BIT SET	136
3330	16" SCROLL SAW	135
3370	4" BELT 6" DISC SANDER	135
3380	8" DRILL PRESS	135
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5860	8 1/4" WORM DRIVE SAW	172
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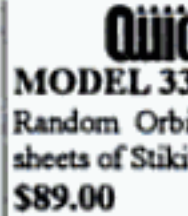
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JS100	BISCUIT JOINER (\$164) AFTER REBATE	134
JS100K	JS100 W 1000 BISCS AFTER REBATE	157
FT2000E	3 1/2" hp PLNG RTR VS (\$205) AFTER REB	175
EB100	EDGE BANDING SYSTEM	208
LM72M10	10" X 24T FLAT TOP RIP BLADE	36
LU64M10	10" X 50T ATB COMBO BLADE	42
LU85M10	10" X 80T ATB FOR MIRROR FINISH	58
LU87M10	10" X 24T RIP BLADE THIN KERF	39
LU88M10	10" X 60T CROSSCUT THIN KERF	46
LU89M10	10" X 72T TCH NON FERROUS METAL	57
LU91M00B	8 1/2" X 48T FOR COMPOUND MITER	41
LU93M10	10" X 80T TCH - BEST FOR LAMINATES	59
LU96M10	10" X 80T TCH LAMINATES OR WOOD	67
TK206	10" X 24T THIN KERF RIPPING	25
TK306	10" X 40T THIN KERF COMBINATION	25
TK606	10" X 60T ATB COMPOUND MITER BLD	39
TK806	10" X 80T ATB ULTIMATE CROSSCUT BLD	44
TK906	10" X 50T THIN KERF CROSSCUT	30
TK406	10" X 60T THIN KERF FINISHING	34
WC104	4 PC WOOD CHISEL SET W CASE	46
WC106	6 PC WOOD CHISEL SET W CASE	56
WC110	10 PC WOOD CHISEL SET W CASE	86
FC107	7 PC CARBIDE FORSTNER BIT SET	64
SD308	8" SAFETY DADO WITH CASE	116
88-100	9 PC BASIC ROUTER BIT SET	104
94-100	CABINET DOOR SET, 1 1/2" SHANK	158

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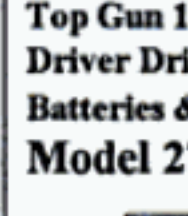


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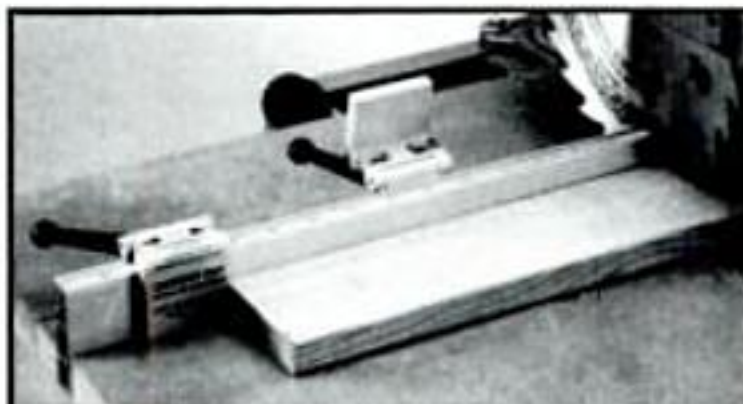


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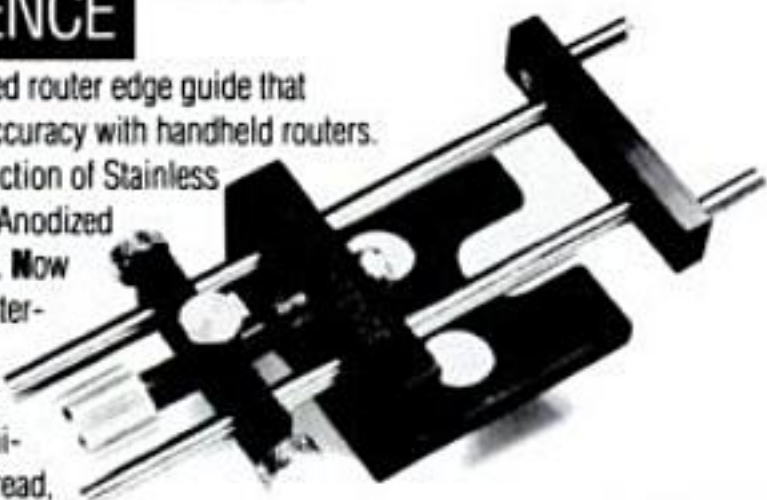
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ADJUSTABLE CLAMP COMPANY

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To order valuable information, simply complete and return the attached form. We'll process your request promptly and the companies will mail the information directly to you.

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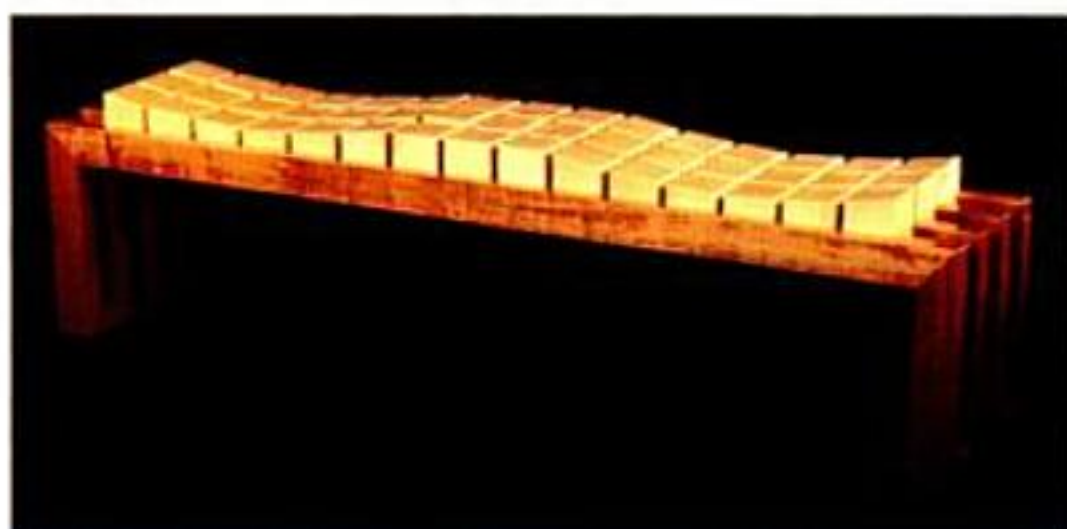
CREATIVE CONSERVATION

What's the best way to conserve wood? Use it. . . creatively. That's the argument being made by a show called "Conservation by Design," now on display at the Rhode Island School of Design (RISD) in Providence. The exhibit features works by more than 70 designers from around the world, all of whom are working toward a common goal of stimulating responsible wood use, said Scott Landis of the Woodworkers Alliance for Rainforest Protection. The show, which runs through January 16, is organized by the alliance and RISD's art museum.



► "Chainsaw" by Henry Black, New South Wales, Australia. Ebony, purpleheart, rosewood, blackwood, white beech, red cedar, holly, red oak veneer, maple veneer, bark, newsprint, currency. Dimensions: W: 44 in., D: 13 in., H: 35½ in.

► "Forest Bench" by Peter Adams, Providence, Rhode Island. Huon pine, myrtle. Dimensions: L: 75 in., W: 19⅝ in., H: 14½ in.



◄ "Medicine Drinks Cabinet" by Ross Straker, Tasmania, Australia. Tasmanian myrtle, myrtle veneer, plywood, recycled insulin vials, glass. Dimensions: W: 7 in., D: 6⅝ in., H: 19 in.



► Box by Carolyn Grew-Sheridan, San Francisco, California. Pine, junk mail. Dimensions: W: 8⅝ in., D: 3⅜ in., H: 4 in.



▲ "Halo Desk" by Stephen Daniel, Easthampton, Massachusetts. Curly yellow birch, cherry, pear, madrone burl, maple and pear marquetry, leather. Dimensions: W: 42 in., D: 24 in., H: 30 in.

GALLERY



▲ "Serendipity" by Dewey Garrett, Livermore, California. Recycled oak and padauk. Dimensions: Dia: 10 in., H: 4 in.



▶ "Hi-tech Shaker Chair" by Lee Schuette, Kittery Point, Maine. Plantation-grown teak, salvaged aluminum, black chrome, woven cotton. Dimensions: W: 18 in., D: 20 in., H: 42 in.



▲ "Soothing the Blues" by Christoph Neander, Providence, Rhode Island. Eastern white pine, maple, cedar, paint, fabric, chalk. Dimensions: W: 42 in., D: 20 in., H: 21 1/2 in.



◀ "Time Sage" by Randy Shull, Asheville, North Carolina. Logging salvage, paint. Dimensions: W: 12 in., D: 10 in., H: 72 in.



◀ "Verde Styx Ladderback" by Jon Brooks, New Boston, New Hampshire. Maple, colored pencil. Dimensions: W: 21 in., D: 28 in., H: 78 in.

▶ Chair by Bruce Beeken & Jeff Parsons, Shelburne, Vermont. Hickory, hickory splint. Dimensions: W: 20 in., D: 18 in., H: 33 in.



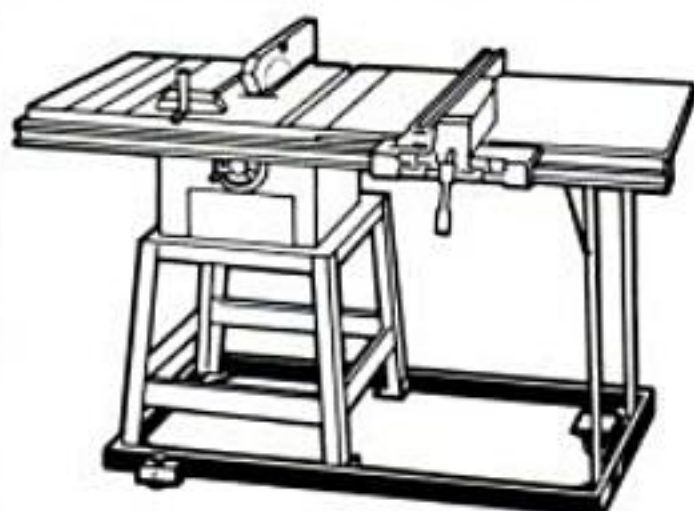
▼ "Nahale Keiki—Child of the Forest" by Martha Chatelain & Gary Zeff, Rancho Santa Fe, California. Macadamia, paper. Dimensions: Dia: 7 1/2 in., H: 7 in.



Want to see your work in "Gallery?" Send color slides or color transparencies to: "Gallery," American Woodworker, 33 E. Minor St., Emmaus, PA 18098. Please include materials, dimensions, name of photographer, your name, address, and phone number. We'll pay you \$35 if we publish your work. If you want your photos returned, enclose a self-addressed stamped envelope.

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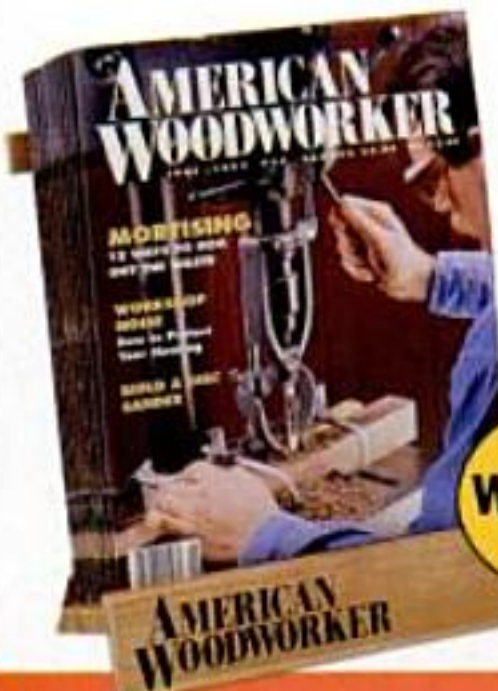
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Import Duties Hit Japanese Tool Makers

Hefty new import fees on some power tools made in Japan might level the playing field for American tool makers, but in many cases the fees won't affect the prices consumers pay for Japanese tools and they won't drive Japanese companies from the American market.

In June of 1993 the U.S. Department of Commerce (DOC) imposed import duties of more than 54 percent on many hand-held, professional-grade cutting tools (such as planers, routers and circular saws) imported from Japan, to punish Japanese companies for alleged "dumping"—selling their tools in the U.S. for less than fair value to capture a larger share of the market.

Makita is now appealing the DOC decision. In the meantime, the big three Japanese tool companies—Ryobi, Hitachi and Makita—say the new fees haven't had a large impact on their product lines because many of the tools aren't manufactured in Japan.

A spokesman for Makita, which has

FINAL PASS

a manufacturing plant in Georgia, said sales aren't quite as good as last year, but part of the reason may be that the yen has increased in value against the dollar, driving up prices. Makita has not pulled any tools from the U.S. market.

According to Brian Sponsler, marketing director for Ryobi's power tool division, that company has managed to avoid the new duties completely. Anticipating the worst, Ryobi relocated production of many of its highest-volume products to its plant in South Carolina before the rulings were issued. However, Ryobi has stopped importing some lower-volume products such as hand-held planers (models L22LK, L150K and L580A), certain routers (models R230, R331, R500, R501 and R600), and circular saws (models W640C, W740C and WD600C).

Many people thought Hitachi would

be hit hardest by the ruling, since it has no American plants. In fact, sales on its popular C8FB sliding compound-miter saw have dropped since the import fees boosted the list price from \$950 to \$1,400. But according to Hitachi public relations counsel Gerald Decker, the company has plants in several countries, so the duties—which only cover products made in Japan—are not devastating.

A spokesman for Black & Decker, the American business which initially lodged the dumping complaint, said the company has only seen a minor increase in sales since the import fees took effect. But, he argued, while the ruling may not damage Japanese companies, it could help the American economy by creating new jobs and increasing sales of domestic materials and parts used to make the tools.

—Susannah Hogendorn

If you have a news item, anecdote or opinion you think belongs in "Final Pass," send it to AMERICAN WOODWORKER, 33 E. Minor St., Emmaus, PA 18098.

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FINAL PASS

Miniatures Fit For a Maestro

They may not play a tune, but otherwise Bart Kennedy's miniature pianos are true-to-scale reproductions of real Baldwins. The inspiration for this "grand" avocation came naturally to Kennedy, who has played the piano since childhood and was trained as a music teacher.

Each miniature takes Kennedy two to three months to make. The body for this piano came from a basswood 2x12, resawn to 1/8 in. wide, and sanded smooth with a Performax drum sander. Case rims are made just like the full-size ones: the wood is bent

around a form, clamped and baked to retain its curved shape. Kennedy casts the metal parts in pewter and brass; the keys are made from resin.

Kennedy's talent hasn't gone unnoticed: he has the Baldwin Company's permission to use their logo on his pianos, and his miniatures have traveled with full-size Baldwins to a piano and organ convention. And in 1990, he received the Miniaturist of the Year Award for the state of Texas. Here's one master miniaturist who deserves a hearty "Bravo!"



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Wood Drying Tips

If you've decided to eliminate the middleman and dry your own wood, the U.S. Forest Products Laboratory has a free booklet you should see. The 56-page "Quality Drying of Hardwood Lumber Guidebook-Checklist" is written mainly for commercial kiln opera-

tors, but woodworkers can benefit from its advice on how to reduce checking and warping when drying wood. To order a booklet, call (608) 231-9200 or write the Forest Products Laboratory, 1 Gifford Pinchot Dr., Madison, WI 53705.

"Premium" Woodworking

*I wouldn't say it puts me
under duress
but I shudder a little
when I see the drill press,
and the piles of wood
so smooth and raw
and I anticipate the roar
of the radial saw*

*he's off on another
woodworking caper
he's stockpiling screws,
and nails, and sandpaper*

*he's good, very careful
always—safety in mind
and I should feel more comfortable
and yet I find*

*that while he's perusing
the hardware store
looking at clamps
I'm off to the post office
to buy more stamps*

*he's planning to say
"look what I made"
I'm making sure
our insurance is paid.*

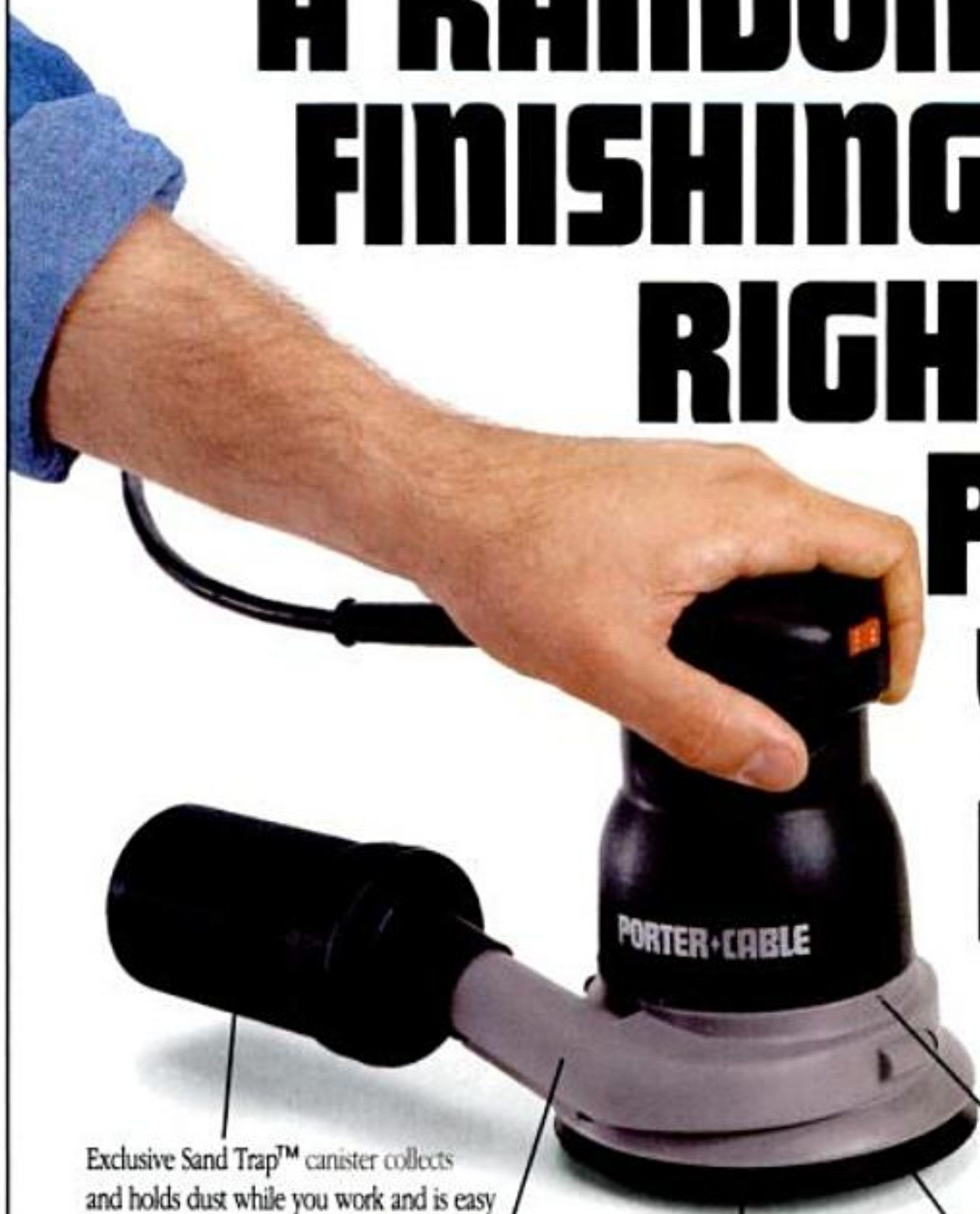
—Crystine Mervis

Wait! There's more to Final Pass this issue than meets the eye. For another story, turn to page 95.

Coming Next Issue:

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- Bowl Turning for Beginners
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