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December 1999 #77



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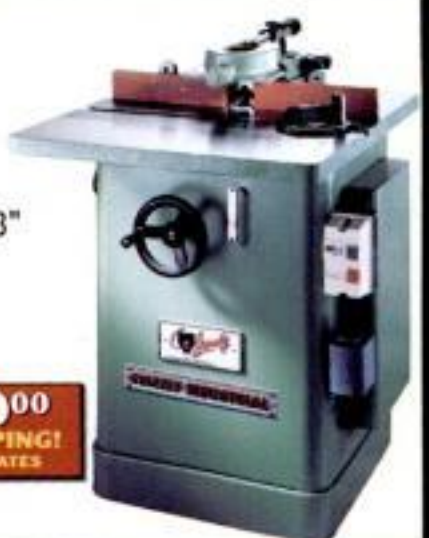


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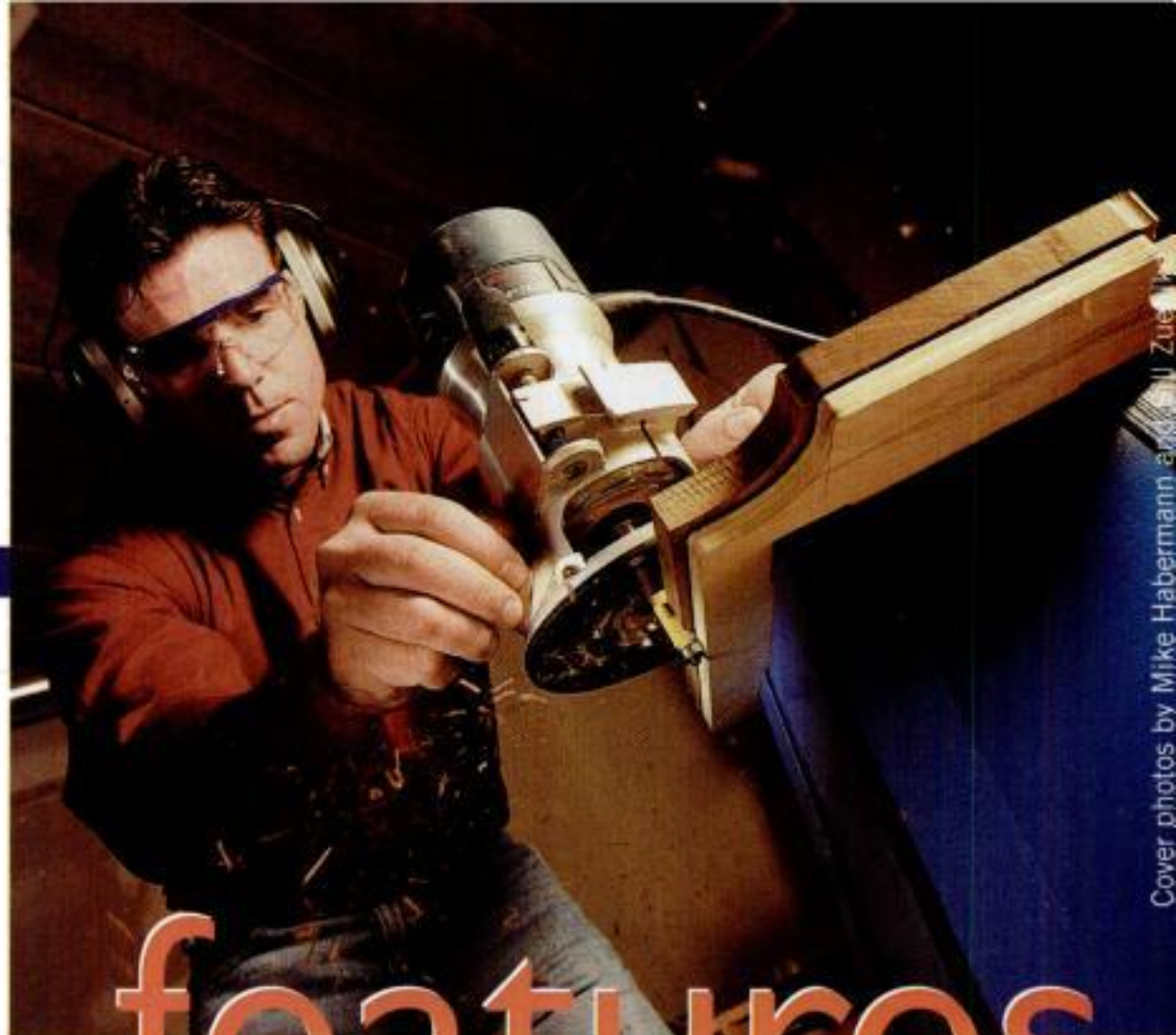
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# Question & Answer

## Keep the Crook

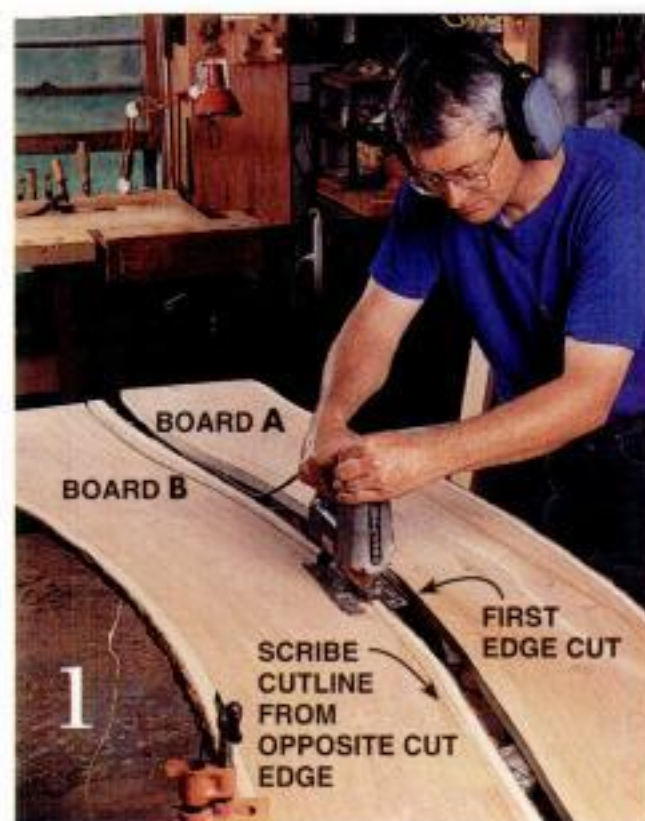
**Q.** I have some planks with a pronounced crook. The grain is beautiful and I would like to make use of the crook in a desk-top design. How can I edge join the boards without losing the crook?

Dennis Nelson  
Waterloo, Iowa

**A.** Joining curved boards is not as hard as it may seem. You'll need a router with a  $\frac{1}{2}$ -in. down-cut spiral bit, \$17, and a  $\frac{3}{8}$ -in. template guide bushing, \$7.50, (available from Woodcraft Supply, 800-533-4482), a jigsaw and a clamping jig wide enough to hold both boards at once.

Lay out the boards in the order they will be glued. Use a jigsaw to rough cut the bark edges on the first board (Board A in Photo 1). Try for a smooth flowing line that's easy for a router to follow. Abrupt changes in direction will not work with this technique. Overlap the second board with the rough-cut edge of the first. Scribe and cut the second board.

Once you're satisfied with the look and fit of the rough-cut edges (try for gaps under  $\frac{1}{8}$  in.), it's time to make the template. Scribe the edge of the first board you cut on a piece of  $\frac{1}{2}$ -in. MDF or particleboard that's as long as the boards you're joining and almost as wide. Cut the template profile with a jigsaw, then use a belt sander to smooth any irregularities. Clamp the rough-cut boards and template on a clamping jig.



First, rough cut the joint.



Then, joint both edges at once.

To make the clamping jig in Photo 2, crosscut 2x4s equal in length to the total width of the boards you're joining. Rip a piece of plywood to that same width. Lay the 2x4s on edge across the plywood like the rungs of a ladder and secure with #8 x 2-in. screws. Make sure there's a 2x4 flush with each end of the board where holes can be drilled for clamps.

Set the gap between the two boards so the bit takes only  $\frac{1}{16}$ -in. from each edge. Follow the template, remove the boards, join with clamps and glue.



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## Veneered-Plywood Tear-Out

**Q.** I use a stacked blade set in my tablesaw for cutting dados. How can I avoid the tear-out I get with veneered plywood?

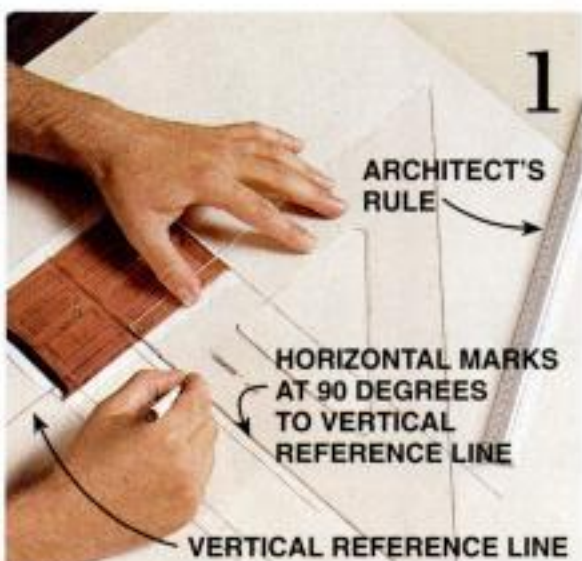
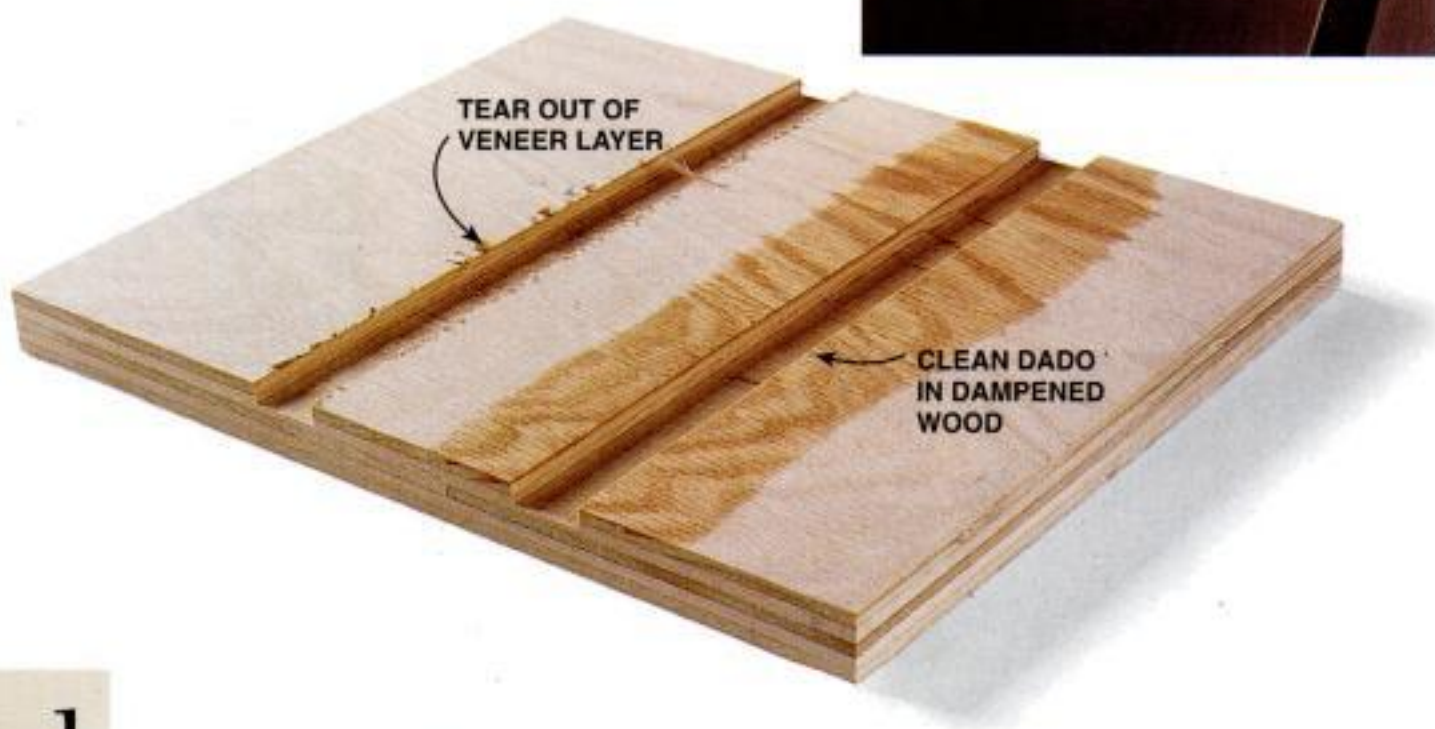
Paul Sandidge  
Dayton, Ohio

**A.** Assuming your dado set is sharp and your fence is exactly parallel to your saw blade, the best device for making clean cuts is a zero-clearance throat plate. You can buy ready-made ones, (available at Trend-lines 800-767-9999 for \$15 to \$20), or make your own.

To make your own, trace the outline of your existing throat-plate insert on  $\frac{1}{2}$ -in. ApplePly (call States

Industries at 800-626-1981 for local distributors) and cut it on the bandsaw. File and sand the edges until you get a good fit in your saw. If the insert is too tall, it can be sanded flush. If it sets below your table, add small setscrews to the underside where the insert is supported by the saw and adjust accordingly.

Finally, try using a damp rag to moisten the surface where the dado will be cut. There's no need to get the wood soaking wet, just a little damp. This will soften the wood fibers enough to help prevent tear-out.



## Taking Dimensions From Photos

**Q.** Sometimes a catalog has a piece of furniture that I'd love to build myself. How can I get the dimensions for a piece of furniture off a photograph?

Shawn Gaspar  
Roanoke, Va.

**A.** Try this method for scaling from photos:

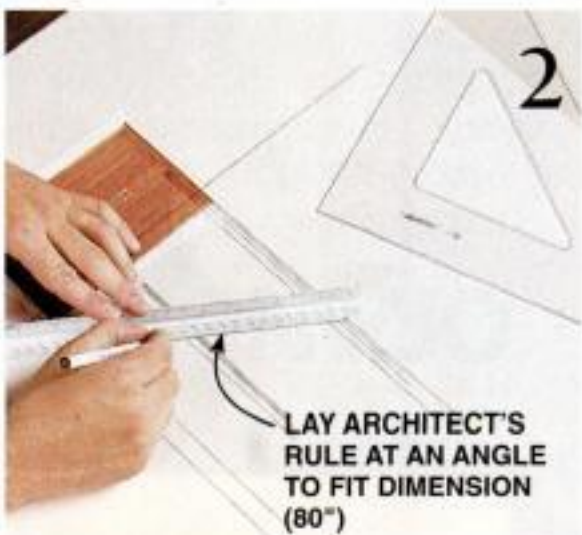
Start by taping the picture to a large piece of paper. Draw a vertical reference line through the piece so that it crosses the detailing you'd like to dimension, like drawers and doors. Use a triangle to mark out horizontal lines wherever you need dimensions. These lines should be 90 degrees

to the vertical reference line (Photo 1).

To determine the scaled dimensions you need an architect's rule. Architect's rules are three sided with a total of six scales starting at  $\frac{3}{32}$  in. to 3 in. They are available at most office supply stores and cost only a few dollars. (Here we chose 80-in. for the height of our cabinet. We used the  $\frac{3}{32}$ -in. scale and set the rule at an angle with the 0 on the top line and the 80 on the bottom.) Draw a line along the rule and measure each space along that line to determine the dimensions of each element.

For the horizontal dimensions, just repeat the process with a horizontal reference line and vertical measuring lines.

If the piece is too tall or too wide, simply change the angle of the ruler to correspond with your desired dimensions.





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## Question & Answer

### Cupped Door Panels

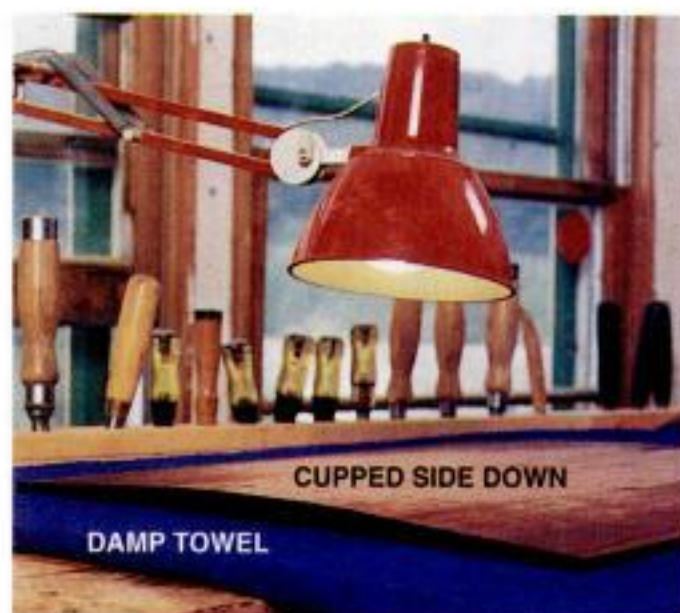
**Q.** Recently I glued up some 1/4-in. panels for cabinet doors. My other life kept me out of the shop for a week and when I returned the panels had a 5/16-in. cup in them. I tried bending them back with clamps and that helped, but they still aren't true. Is there anything else I can do?

Allen Ambrose  
Sacramento, Calif.

**A.** Let's start by trying to identify the cause of your problem. A panel that's left lying on a workbench will have one side exposed to the air and the other flat against the benchtop. Any changes in relative humidity affect the exposed side sooner than the unexposed side. Increased humidity will cause a rise in the moisture content of the exposed face causing it to expand while the side against the bench remains dimensionally stable. This causes the panel to cup with the concave side down. Dry air would cup the panel in the opposite direction.

You might be able to reverse the cup in your panels by sticking them with weight on top and allowing the moisture content of the wood to equalize between the two faces. Sometimes spraying a little water on the concave side helps, too. The lesson here is to sticker your machined parts throughout the building process.

Panels made by resawing a board are prone to cupping due to interior tension created by the drying process. Like letting go of a stretched rubber band, the sawn face will shorten after resawing and create the cup. You can try to cure the condition by laying the cupped panel, concave side down, on a damp towel. Use a heat lamp as a heat source over the convex side. You want the panel to end up slightly cupped in the opposite direction. Be sure and stick around to monitor the process. When the panel cools and dries, it should be flat.



### Soaking Stones

**Q.** I just bought a 6,000-grit Japanese waterstone mounted on a wooden base. Can I soak it like my other stones? Also, what's the purpose of a Nagura stone?

Chuck Mann  
Peoria, Ill.

**A.** Your 6,000-grit waterstone absorbs water quickly and doesn't need to be kept in water. Just lay the stone in a shallow pan of water for 5 to 10 minutes before use.

Traditionally, Nagura stones were used to flatten and clean up the surface of natural-finish stones. With synthetic stones, their chief benefit is in quickly creating a paste on the stone's surface. The paste serves as a final polish and is usually made up of finely ground particles created by the sharpening process itself. Because the 6,000-grit stone is so hard, developing the paste simply by sharpening can take some time.

Sources for Nagura and finish stones: The Japan Woodworker (800) 537-7820 and Hida Japanese Tool Co. (800) 443-5512.

**Editor's Note:** In AW #75, page 8, we answered a question about sharpening stones. We did not give the correct grit recommendations as given to us by Peter Korn. The last sentence should read: "In terms of coarseness, a soft Arkansas is roughly equivalent to a 1,000-grit waterstone while a hard, black Arkansas is closest to a 6,000-grit waterstone."





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## Question & Answer

# Respirator for Methylene Chloride?

**Q.** In Issue #73 you recommend wearing an "activated-carbon respirator" when methylene chloride-based strippers are used. My safety equipment supplier says that organic vapor cartridges are ineffective against methylene chloride. What gives?

Michael Dole, Lancaster, Penn.

**A.** Methylene chloride is a suspected carcinogen. In 1997, OSHA lowered its Permissible Exposure Level (PEL) from 500 PPM for an eight-hour period, to 25 PPM.

Your first line of defense where MC is concerned is ventilation. The fumes must be removed from the workspace altogether. Although an approved spray booth or working outside may be the best solution. Also, a floor fan that exhausts outside can do the trick. (MC fumes are heavier than air and tend to concentrate at floor level so a window fan alone won't do.)

When ventilation is inadequate OSHA standards allow only supplied-air respirators in an MC atmosphere. This is because activated-carbon cartridges only offer protection for a matter of minutes. Most people change their cartridges when they smell fumes but the human nose cannot detect MC below concentrations of 300 PPM, which is 12 times OSHA's limit of 25 PPM in an eight-hour period. This means there's no way for a user to know if their cartridge has worn out before they exceed recommended exposure limits. Note: Activated-carbon respirators do protect against some of the other ingredients found in MC strippers. So use your mask!

For the weekend furniture restorer the cost of a supplied-air respirator, (which can exceed \$1,000) is prohibitive. But keep in mind that OSHA's exposure limits are based on eight hour time frames and that good ventilation is still the best solution.

Here are some additional practices OSHA recommends for avoiding over-exposure to MC fumes:

- Keep the stripping solution around 70-degrees F. At this temperature, wax in the solution forms a vapor barrier that prevents the solution from evaporating too quickly. If the temperature is too high or too low, the wax will not form a vapor barrier.
- Avoid breathing the air directly above the furniture during stripping.

We got help in answering this question from Tom Towers at OSHA and the Technical Service folks at 3M.

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# Pencil Mark Cleanup

**Q.** How do I get the pencil marks off my oak plywood bookcase? I tried using an eraser, but that didn't get down into the open grain. When I tried sanding it out I ended up erasing the paper-thin veneer instead! I don't want to sand anymore and run the risk of ruining the whole piece. Is there a way out of this?

Bill Bork,  
Pensacola, Fla.

**A.** The solution to your dilemma came by accident one day as I was making color samples for a project. I labeled each piece of wood with a pencil before testing the finish recipes. On the sample that used shellac as a sealer, I noticed the pencil marks disappeared as I brushed on the shellac. The denatured alcohol in the shellac is also a solvent for pencil lead!



Remove your pencil marks without abrasives using a white rag and denatured alcohol. The alcohol loosens the bond of the carbon-based pencil marks allowing the rag to pick up the suspension. Work in a well-ventilated area; wear rubber gloves and a respirator. Wet the rag with alcohol or, if there are a lot of pencil marks to erase, pour it right on the piece itself. Add a little elbow grease and rub away your troubles.

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## Liquid vs. Dry Hide Glue

**Q.** I have been using liquid hide glue because its longer open time makes final assembly less of a battle. My success with the liquid form has led me to wonder about the traditional, dry form. What's the difference between liquid and dry hide glue?

Anne Thronson  
Minot, N.D.

**A.** Hide glue has been around almost as long as woodworking itself and yes, it really is made from the hides of animals.

Liquid hide glue comes ready to use, and has two big advantages: convenience and a long open time.

Traditional hide glue is sold in a dry state as pearls or flakes, which must be dissolved in water and heated in a glue pot to 130 to 140 degrees F before use. Traditional hide glue has these characteristics:

- quicker initial set (gel set)
- comes in various strengths or gram strengths
- indefinite shelf life
- additives are available to alter the open time and cured-state properties.

The quick gel set results from the rapid temperature loss of the glue immediately after application and gives traditional hide glue a short open time (one to five minutes). This is an advantage in applications like hammer veneering and rubbed joints where a strong initial tack is desirable.

Liquid hide glue cures through moisture loss alone and has a much longer open time (10 to 15 minutes). Anyone who's had to go solo on a complex glue up can appreciate this.

The bond strength of hide glue varies according to its gram strength. The higher the gram strength the stronger the bond and the shorter the open time. Liquid hide glue has a gram strength of 251 which is considered best for general-purpose woodworking.

Liquid hide glue has a shelf life of up to one year. Traditional hide glue will last forever in the dry state. However, once it is mixed with water, it has a shelf life of at most two days.

Traditional hide glue can take a number of additives like glycerine, which adds flexibility to the cured glue, and urea, which increases the open time. All of these possibilities make traditional hide glue the most versatile glue on the market.

Special thanks to Eugene Thordahl and the technical service folks at Franklin International for help on this question. **AW**

For more information on traditional hide glue see AW #65, page 54, or visit Bjorn Industries Web site at [www.bjorn.net](http://www.bjorn.net).

Sources for hide glue:

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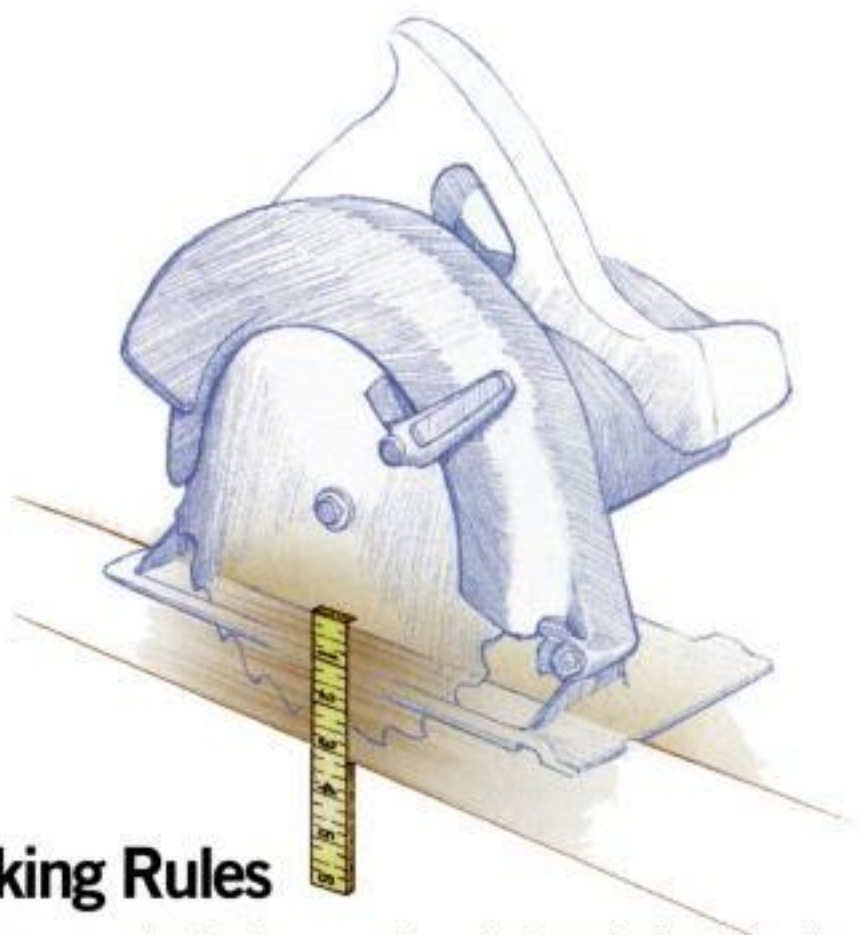
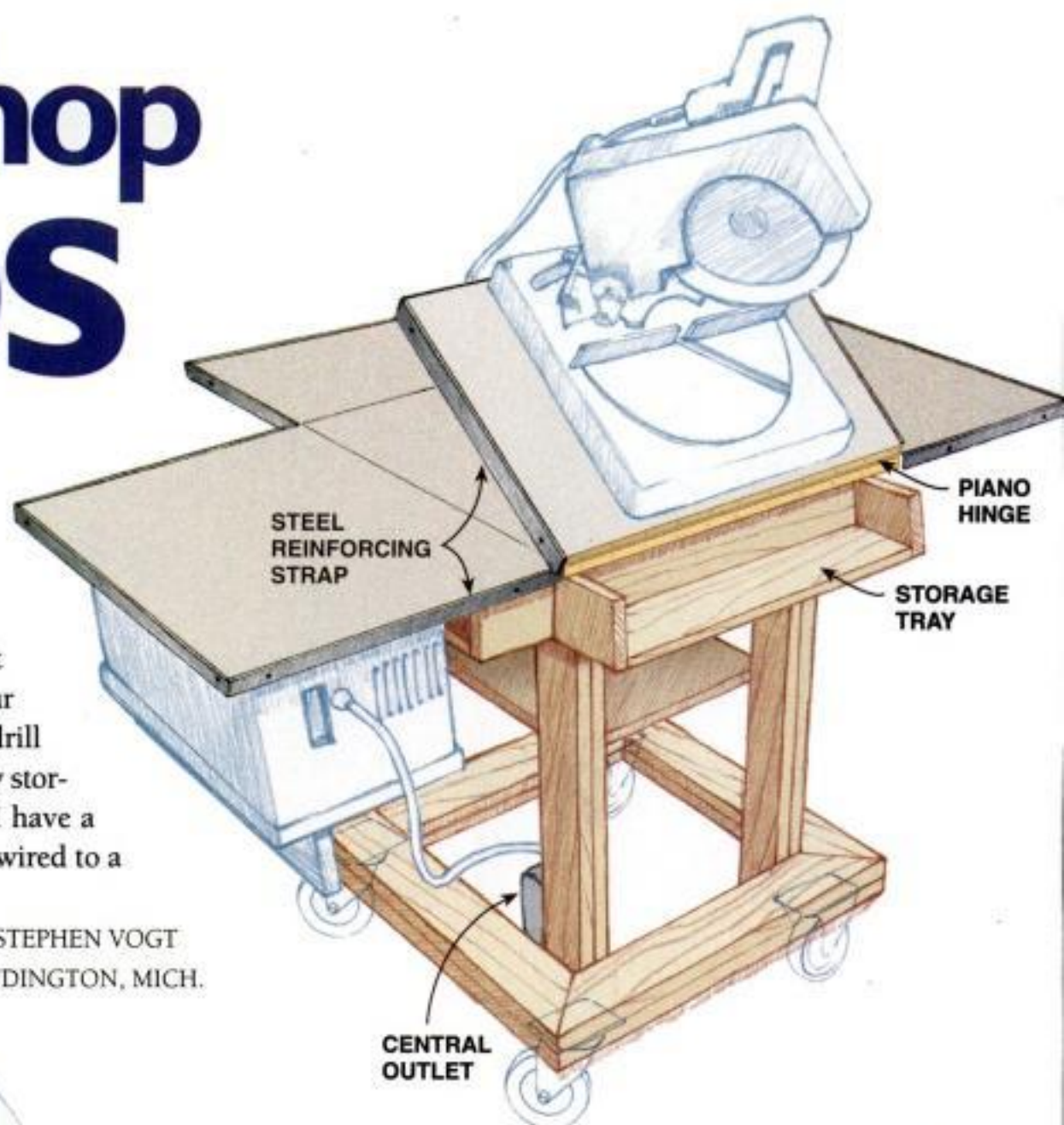


# WorkShop Tips

## Mobile Machine Caddy

My shop space is so limited—only 12 feet square—that I designed this system to house four machines: belt-disc sander, miter saw station, drill press and planer. Each machine has an accessory storage tray below. With all the machines down I have a clear working surface above. Each machine is wired to a central outlet so it's always ready for use.

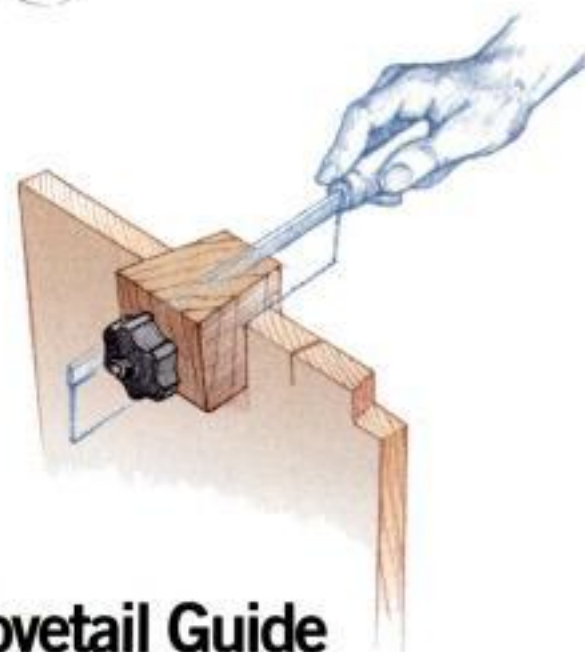
STEPHEN VOGT  
LUDINGTON, MICH.



## Breaking Rules

Don't throw away that broken, wooden rule. Strip the hardware from a 6-in. section. Then cut a slot for it in the front edge of your workbench with a router. Place the zero mark flush with the top. You now have a permanent depth gauge for adjusting circular saws, routers, marking gauges, etc.

RALPH PEARSON  
WILLIAMSBURG, PENN.



## Dovetail Guide

With the onset of Parkinson's disease I found I could no longer saw straight lines without a guide. Some of my projects involve cutting dovetails and rather than switch to a router I made this steadying jig. It clamps to the work and has a large enough knob so I can easily position the guide where I need it.

DON ENNIS  
CEDAR CITY, UTAH





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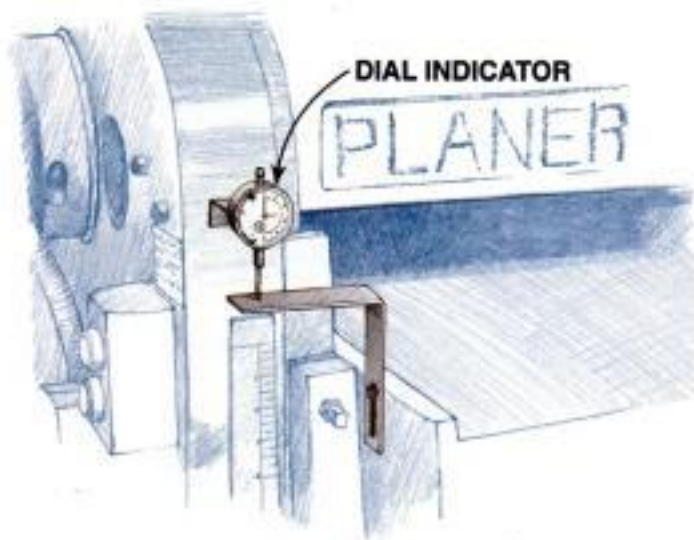


## Workshop Tips

### Grind Your Own Knives

With this simple jig, a drill press and a cup grinder, I can sharpen any jointer or planer knife. First I make a hardwood block and cut it to  $\frac{1}{16}$  in. less than the length of the knives. Then I add a retaining piece at each end, as shown. Install a medium-grit cup grinder in the drill press and set the speed at the high end of its range. Lower the grinding wheel until it just touches the blade, then lock the quill. Continue grinding until all the nicks in the knife are removed. Use the same procedure to grind the remaining knives, then hone them on an oil or waterstone in the usual way.

ARTHUR CHISM  
HOT SPRINGS, ARK.



### Dial Indicator for Planer

Thickness gauges on planers are seldom accurate, so I added a dial indicator to mine. I bolted a piece of angle iron to the upper casting and mounted the dial indicator. Then I added a sturdy piece of strap iron to the bed of the machine and bent it to a 90-degree angle, as shown. This addition allows me to exactly repeat a previous setting and also to remove precise amounts of stock.

ANTHONY NECCI  
WILSON, N.C.

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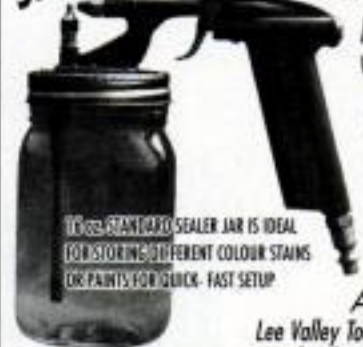
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## Classy Face Frames

I make a lot of traditional face frame cabinets and it's always a problem covering the raw edge of the plywood at the corners. A normal face frame is very obtrusive when viewed from the side. My solution is to attach rabbeted edging, as shown. This gives a finished look and the corner can sustain minor damage without marring the veneer. With a little easing of the corner, the face frame joint is almost invisible. You do have to cut the top and dividers so they are set back from the sides by the depth of the rabbet.

MICHAEL KURTZ  
TOLEDO, OHIO



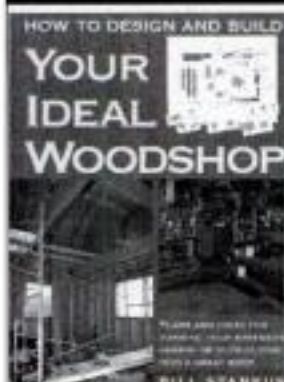
## Workshop Tips

### Triangle Sandpaper

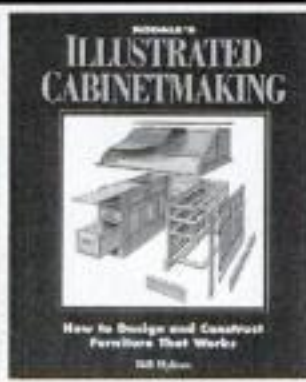
Triangular hook-and-loop sandpaper for detail sanders first loses its bite at the end because that part does most of the work. By cutting a used piece, as shown, and shifting it forward on the pad, you can obtain a fresh end four more times before replacing it with a new piece.

BRIAN STANLEY  
YORBA LINDA, CALIF.

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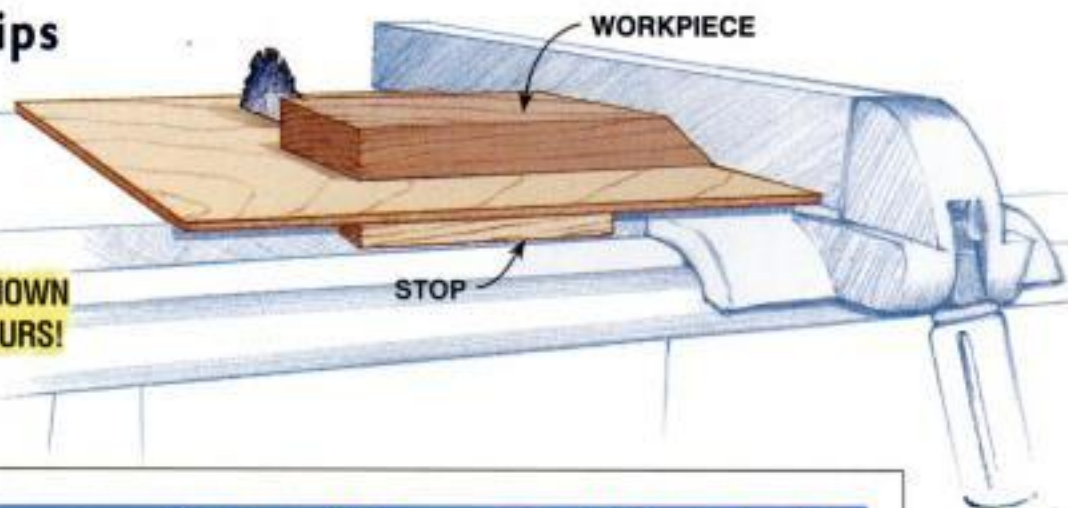
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## Workshop Tips

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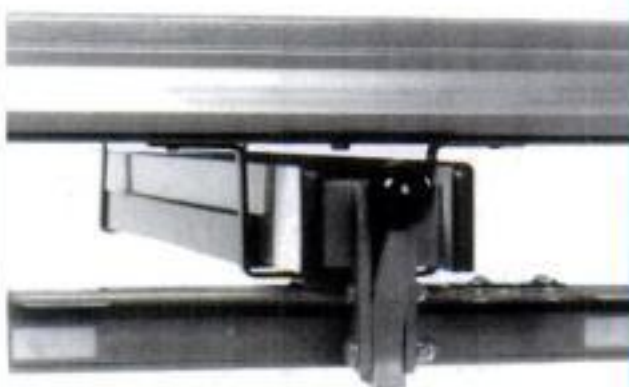
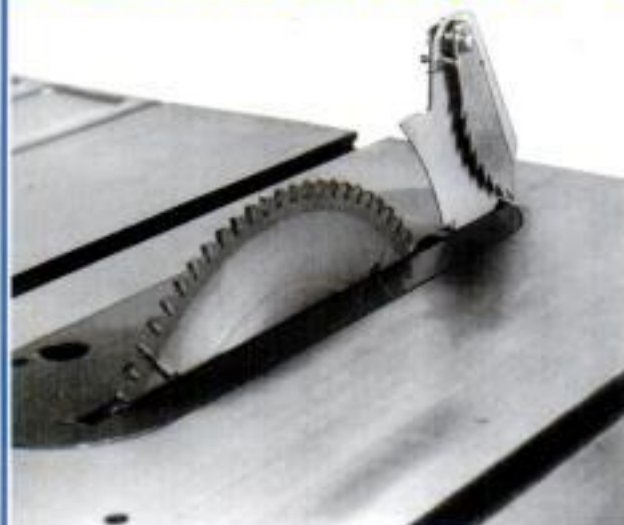
## Slipping Edges

Sharp edges and thin laminates have a way of slipping under the tablesaw fence and ruining a project—or worse.

My answer is to lay a piece of 1/4-in. hardboard or plywood up against the fence. A stop at the back prevents the assembly from sliding forward as I push the work past the saw blade.

MIKE HOFER  
ROSETOWN, SASK.

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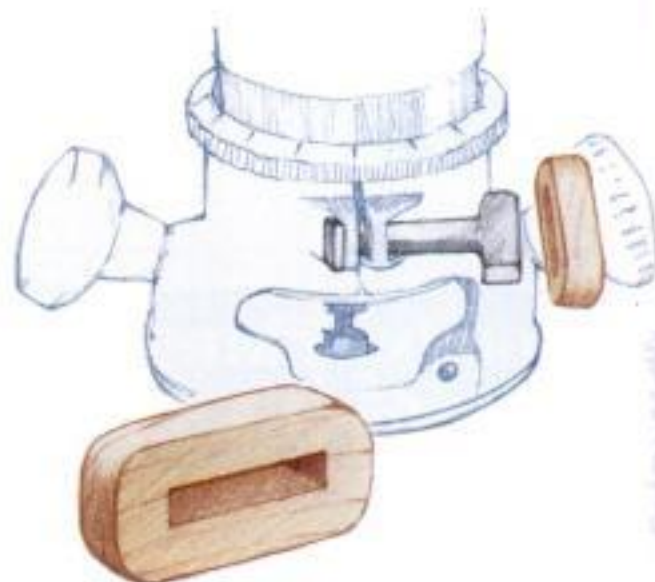
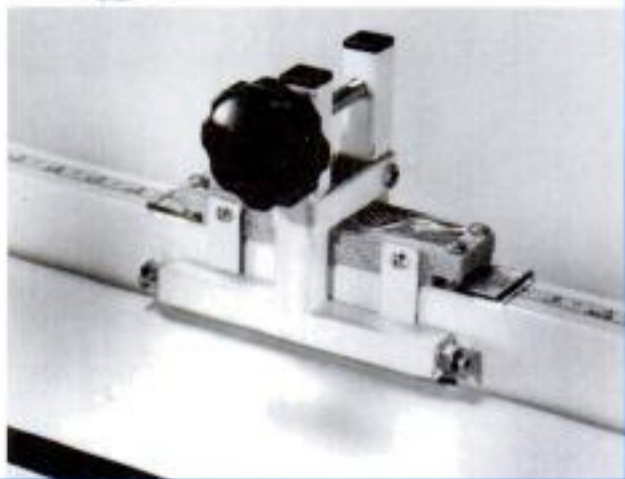
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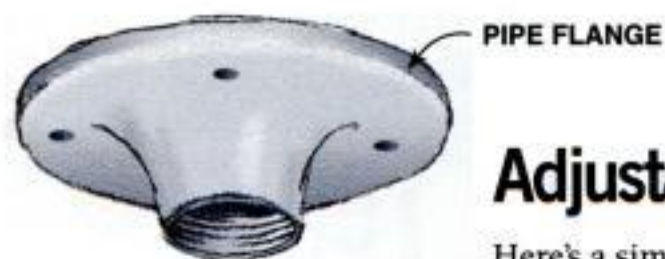
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ALAN THOMAS  
HARRISVILLE, R.I.

If you have an original tip you'd like to share, send it to Workshop Tips, American Woodworker, 2915 Commers Drive, Suite 700, Eagan, MN 55121. We pay \$200 for tips we print. Original contributions become our property upon acceptance and payment. We're sorry, but tips can't be returned.

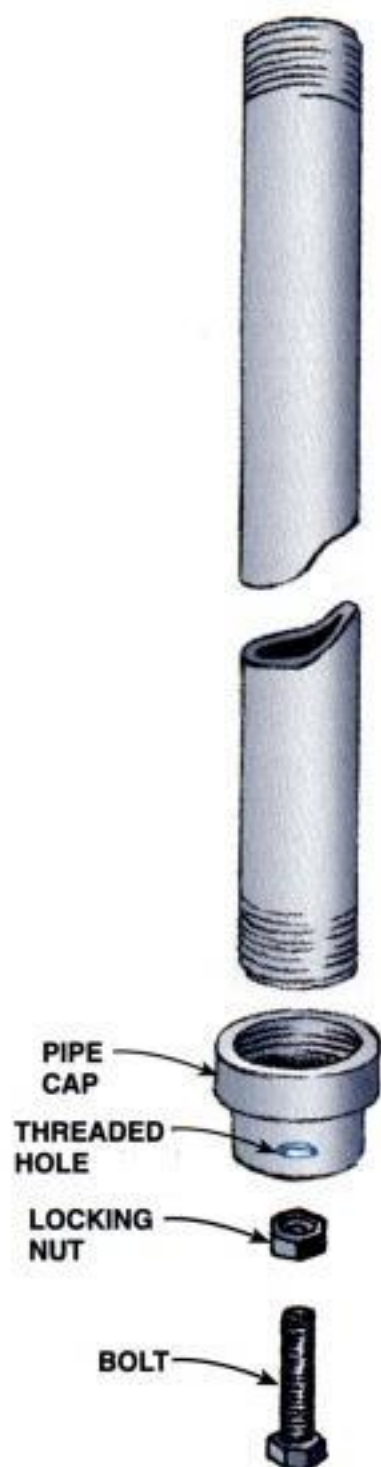




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Here's a simple way to make adjustable legs for tool stands. All the items are available at the hardware store and the cost is low. I've found the assembly rigid enough that no extra bracing is necessary.

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Woodturning by Steve Blenk

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This project requires a fair amount of turning experience. If you're patient, however, you'll find that making this ornament is a good way to learn new techniques. Shaping a delicate spindle takes practice, but you can make up the shape of the icicle as you go. If you've never hollowed a vessel before, this ball is an easy first project—the inside doesn't have to be smooth and polished. The ball is hollow to reduce its weight.

Choose a light-colored wood with interesting grain for the ball. It should be one solid piece, 2½- to 3-in. square. I like to make more than one ornament at a time, so I use a rough blank about 8-in. long in order to make two balls. Make the cap and icicle from a contrasting dark wood that takes fine details. I like to use rosewood or ebony. You'll need a piece that's 1-in. square and 8-in. long.

You'll need a scroll chuck, a Jacobs chuck and a live center as well as a small hollowing tool and tools for turning a small spindle ([see Sources, p. 32](#)).

Begin by mounting the stock for the ball between centers and turning it into a cylinder.



**1** Turn a tenon to fit your chuck. Then mount the cylinder in the chuck with the shoulders firmly resting on the chuck's jaws.



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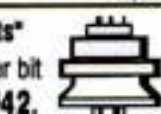
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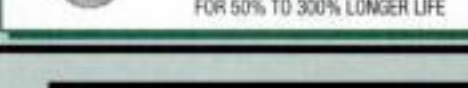


Standard C-2 Carbide (left) and  
FORREST still sharp Oxidation  
and Corrosion Resistant Sub-  
Micron C-4 Carbide (right). Each  
shown after cutting 3,500 feet of  
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**DURALINE HI-A/T FOR TABLE & RADIAL SAWS**  
ALL FLAT FACE  
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Larger holes - time basis. Shipping \$6.00.

| Faster feed rates &<br>absolute splitter control.<br>Saves splintering on OAK,<br>BIRCH, PLY, VENEERS &<br>MELAMINE. "Our Best<br>Plywood Blade." | 8" 1/4" & others available<br>10" x 40T 1/8" or 3/32"<br>12" x 40T 1/8" or 1" hole, 1/8"<br>14" x 40T 1/8" hole<br>16" x 40T 1/8" hole | List Price<br>\$142<br>\$177<br>\$265<br>\$219 | 10% Off<br>Per Blade<br>\$127<br>\$159<br>\$238<br>\$197 | 20% Off<br>Second Blade<br>\$102<br>\$127<br>\$214<br>\$159 |
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See American Woodworker April 1998 pp 64-65

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With this one ALL PURPOSE blade you can RIP & CROSSCUT 1"-  
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- Ends cutting 1/16" oversize to allow for RESURFACING
- BUY AND SHARPEN 1 BLADE INSTEAD OF 3

| WOODWORKER II             | List  | SALE  | 10%   | 20%   |
|---------------------------|-------|-------|-------|-------|
| 14" x 40T x 1"            | \$215 | \$149 | \$134 | \$119 |
| 14" x 30T x 1"            | 195   | 139   | 125   | 111   |
| 12" x 40T x 1" + 5/8"     | 183   | 129   | 116   | 103   |
| 12" x 30T x 1"            | 162   | 119   | 107   | 95    |
| 10" x 40T x 1/8" or 3/32" | 156   | 119   | 107   | 95    |
| 30T x 1/8" or 3/32"       | 135   | 99    | 89    | 79    |
| 8" x 40T                  | 146   | 109   | 98    | 87    |
| 30T                       | 125   | 99    | 89    | 79    |
| *8-1/4" x 40T 3/32"       | 136   | 99    | 89    | 79    |
| 8" x 40T 3/32"            | 136   | 99    | 89    | 79    |
| 30T 3/32"                 | 115   | 89    | 80    | 71    |
| 7-1/4" x 30T 3/32"        | 112   | 89    | 82    | 65    |
| **New 6" x 40T 3/32"      | 136   | 89    | 80    | 71    |

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|---------------------------------------------|-------|------|
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| Sears 8-1/4" & Delta 8-1/4" x 60T x 5/8"    | 170   | 109  |
| Hitachi 8-1/2" x 60T x 5/8"                 | 179   | 119  |
| DeWalt 8-1/2" & Ryobi 8-1/2" x 60T x 5/8"   | 179   | 119  |
| Delta 9" x 80T x 5/8"                       | 204   | 129  |
| Ryobi-Makita & all 10" x 80T x 5/8"         | 207   | 139  |
| DeWalt, Makita, B&D, Hitachi 12" x 80T x 1" | 229   | 149  |
| Ryobi-Makita 14" x 100T x 1"                | 266   | 189  |
| Hitachi 15" x 100T x 1"                     | 277   | 199  |

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| 8" x 80T x 5/8" 3/32" K       | 156   | 119   |
| 6" x 80T x 5/8" 3/32" K       | 150   | 109   |
| NEW                           |       |       |
| 8-1/4" x 80T x 5/8" 3/32" K   | 180   | 109   |
| 7-1/4" x 80T x 5/8" 3/32" K   | 180   | 109   |

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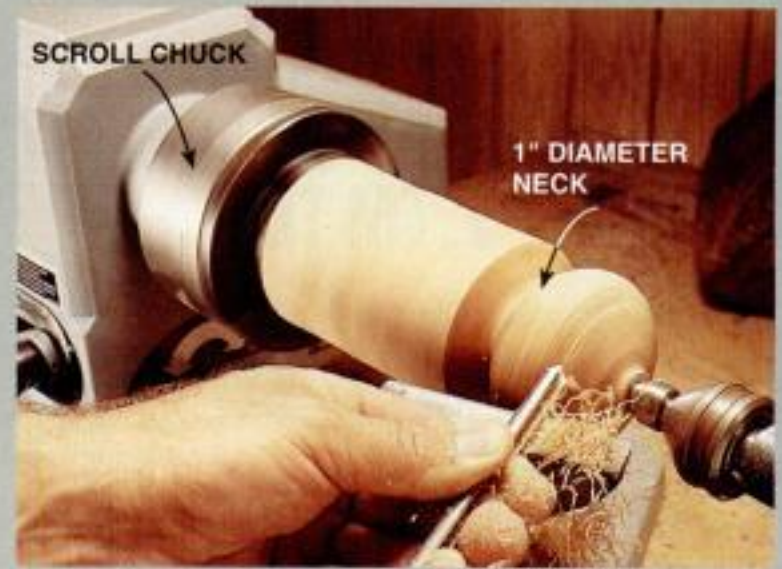
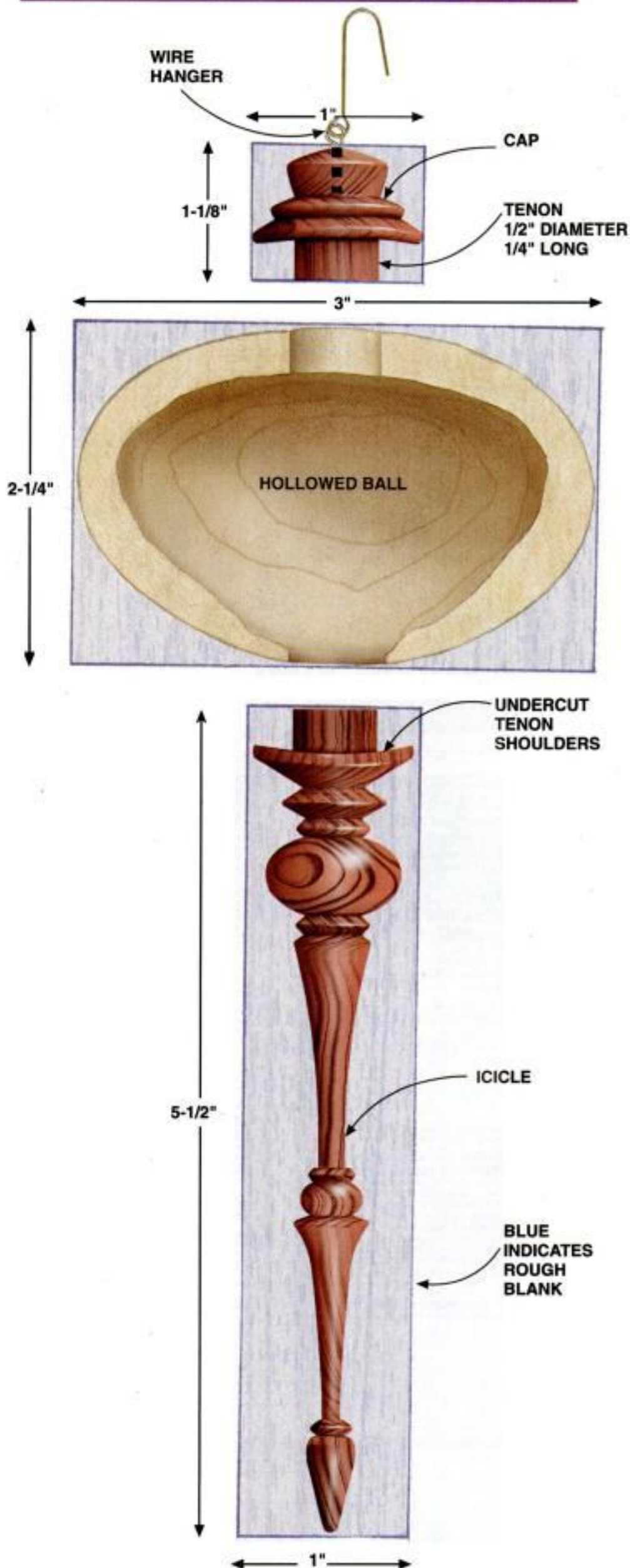
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# Woodturning

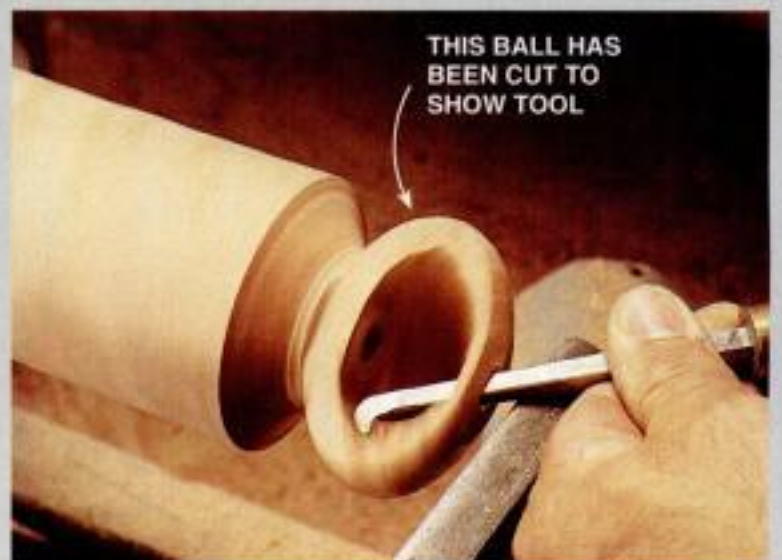
**FIG.A Ornament Cross-Section** drawn to scale



**2 Shape the ball** into a compressed sphere. Turn the neck to a 1-in. diameter. Stop the lathe and pull back the tailstock in order to clean up the end of the ball. A good chuck will securely hold the work without the support of the tailstock, but make light cuts.



**3 Bore the end** of the ball with a 1/2-in. bit mounted in a Jacobs chuck. Set the lathe at its lowest speed. Put a piece of tape on the bit if you need a depth stop. The hole must go completely through the ball. Steady the bit with your hand to dampen any severe vibration.



**4 Scrape the interior** of the ball with a small hollowing tool, using light cuts. Frequently clear out the waste with a shop vacuum or a blast of compressed air. The purpose of hollowing the ball, which can be rough inside, is to reduce its weight.



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## Raised Panel Door Instructional Video

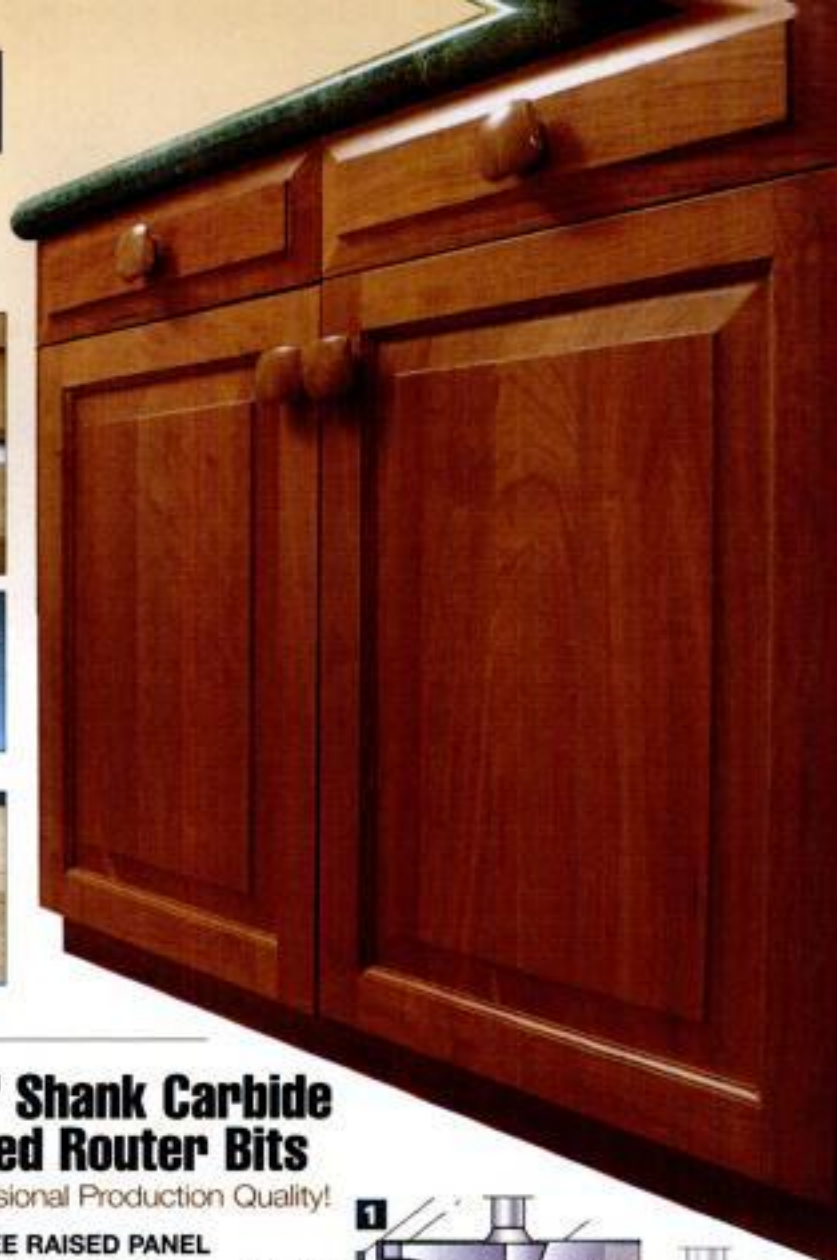
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\*Combination Rail & Stile Bit



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|                                          |       |
|------------------------------------------|-------|
| WOOD Product Scorecard                   |       |
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| Performance                              | ★★★★★ |
| Value                                    | ★★★★★ |



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Professional Production Quality!

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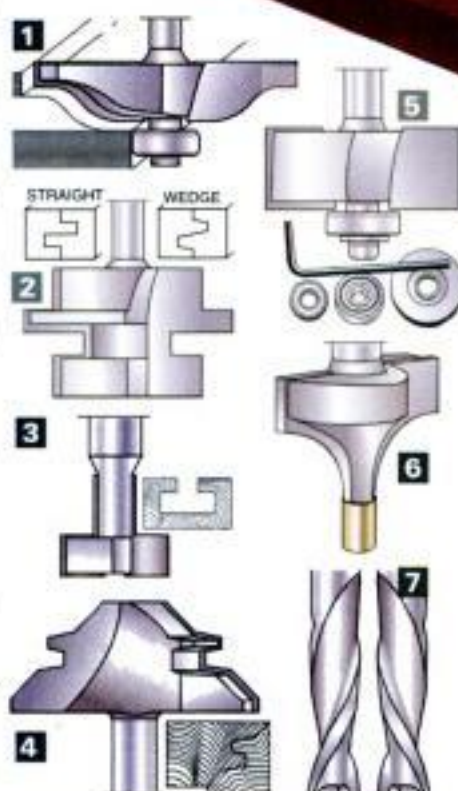
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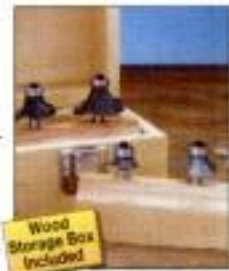
Sizes: 1/4", 3/8", 1/2", 5/8", 3/4", 7/8", 1", 1-1/8", 1-1/4", 1-3/8", 1-1/2", 1-5/8", 1-3/4", 1-7/8", 2", 2-1/8".



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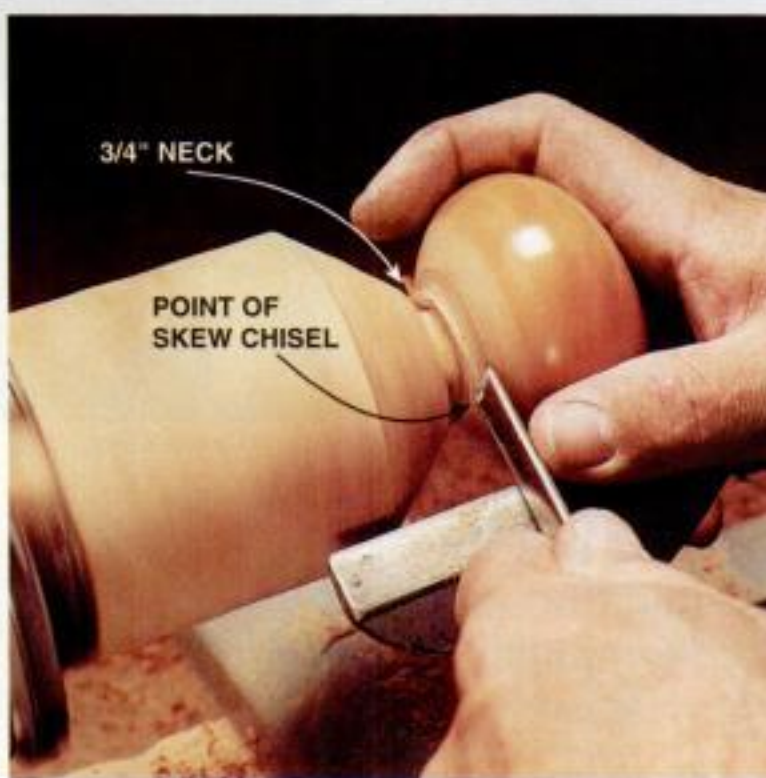


## Woodturning



**5** Apply a padding finish to the ball as it spins on the lathe. Then reduce the diameter of the neck between the ball and cylinder down to about 3/4-in.

**6** Part off the ball with a skew chisel's shearing cut. Ride the bevel of the chisel on the work. The ball will fall off into your hand when you reach the 1/2-in. hole. You can use a parting tool instead, but then you'll have more sanding to do.





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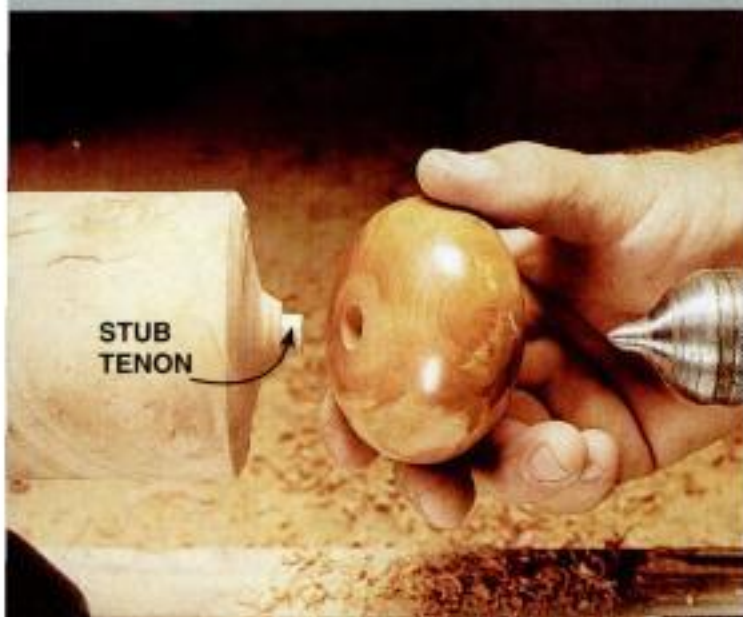
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## Woodturning



**7** Reverse the ball and mount it on a stub tenon that you've turned on the cylinder. Support the other end of the ball with a live center inserted into the hole. Now you can clean up any marks left by the skew chisel. Sand and finish the rest of the ball.



**8** Size a tenon on the cap piece to fit the ball's hole. Undercut its shoulders, too. The cap piece, as shown here, is glued into a shallow hole turned into the face of a waste block. Shape the cap, then part it off the waste block. To clean up the tip, reverse the cap and push the tenon into a new hole in the waste block. Finish the cap on the lathe, then remove it and drill a small, shallow hole for the hanging wire.

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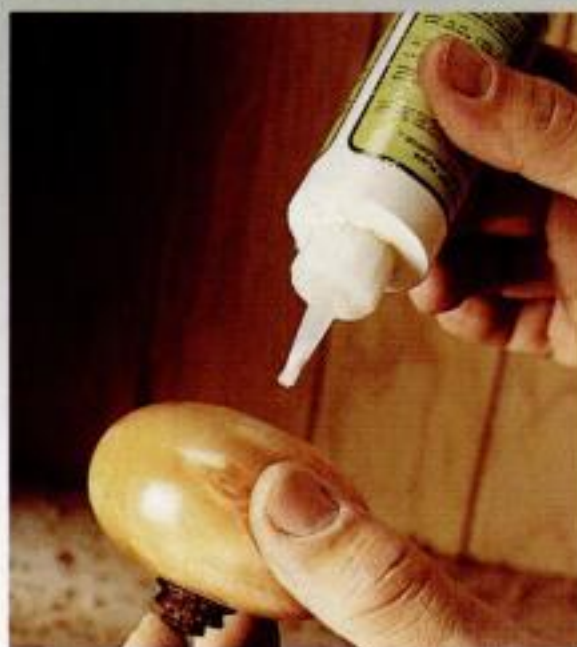
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## Woodturning



**9** Support the spindle with one hand as you cut icicle shapes. First turn a tenon at the tailstock end to fit the lower hole in the ball. Undercut the tenon's shoulders so the icicle fits tight on the rounded bottom of the ball (Fig. A). Then turn the larger diameter cove, beads and fillets. Move downhill towards the headstock to cut the smallest diameters last. Apply a finish.



**10** Drip cyanoacrylate (CA) glue into the ball while holding the cap in place. This will firmly anchor the ball to the cap. To attach the hanging wire (see Sources, below), place a drop of glue on top of the hole and push in the wire. Apply glue to the icicle's tenon and place it in the bottom hole. Slow setting CA glue works best for oily exotic woods such as rosewood and ebony. **AW**



### Sources

All the tools you'll need for making this ornament are available from Packard Tools; (800) 683-8876. One-Way Stronghold Chuck #112610; \$259 Jacobs Chuck #2 Morse Taper 11102; \$37 Delta Live Center #2 Morse Taper 1146-490; \$78 45-Degree Hollowing Tool 103381; \$26 Miniature Turning Tool Set 103370; \$75 French Ear Wires (set of 12) 152110; \$5

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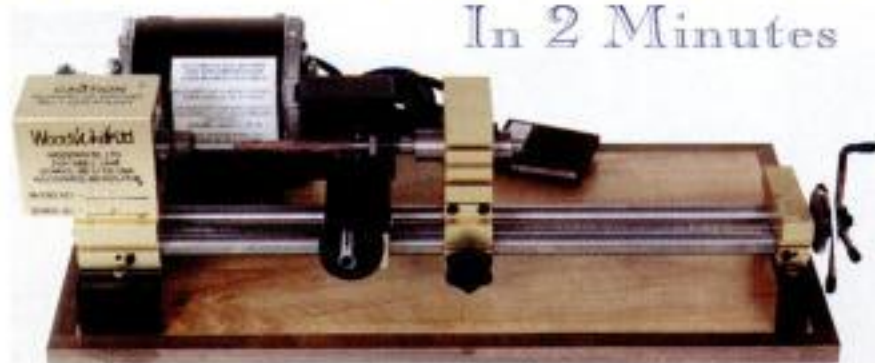
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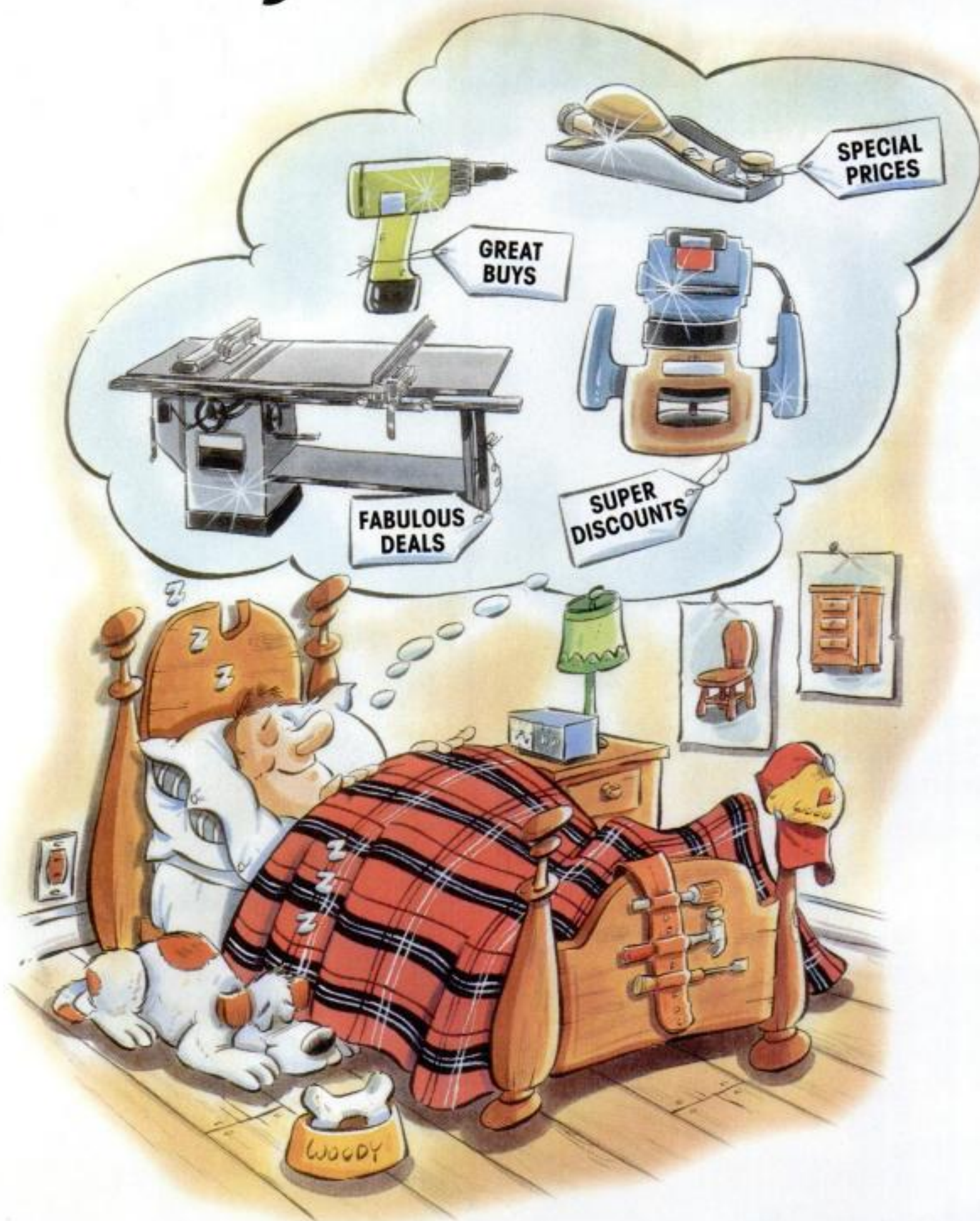
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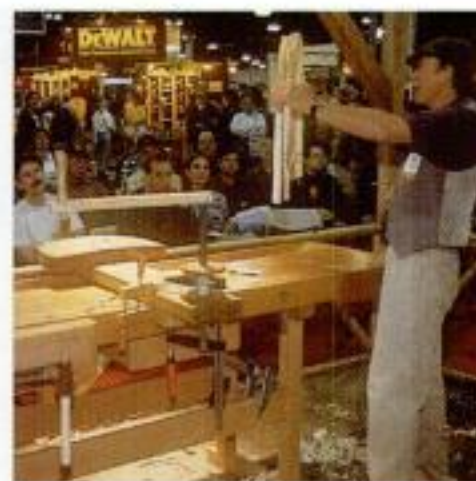
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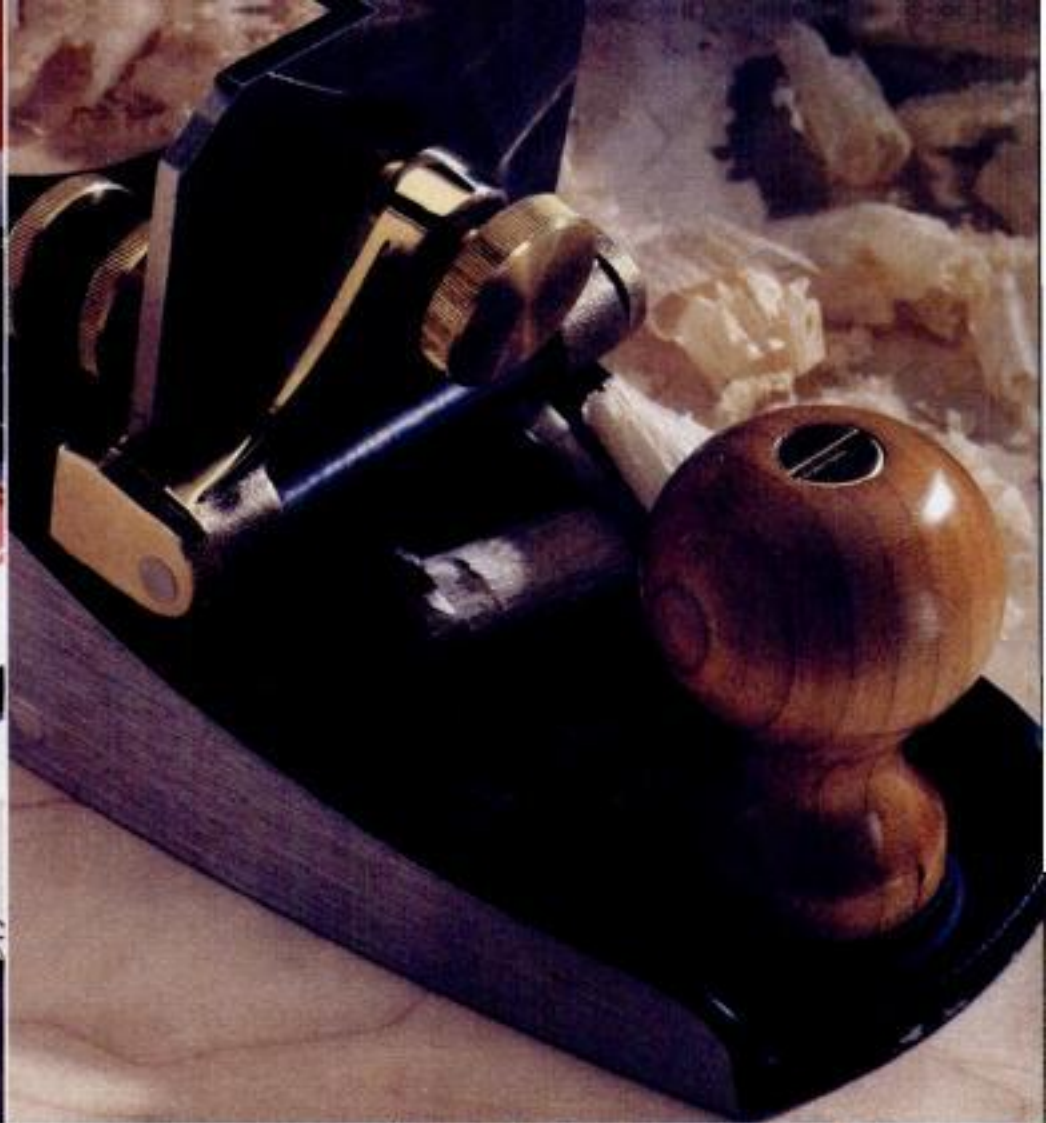
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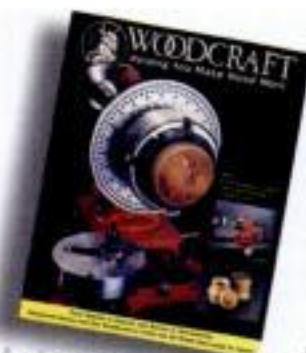
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# Dovetailed STEP STOOL

by

*Frank Klausz*  
Frank Klausz

*Three kinds  
of dovetails  
make it  
extra  
strong.*

**A**FTER I FINISH A LARGE COMMISSION, I like to surprise my client during the holidays with a gift—this sturdy kitchen stepping stool. Making one is a pleasure because it's held together by nothing but dovetails, and I love hand cutting dovetails.

A kitchen stool that will face hard use has to be strong. When you stand on the stool and hold onto its tall back for balance, you put extra strain on the joints. That's why this stool is dovetailed throughout, because dovetails make the strongest connection between wide boards. If they fit tight the mechanical interlocking alone is enough to hold boards at a rigid right angle. Adding glue is icing on the cake.

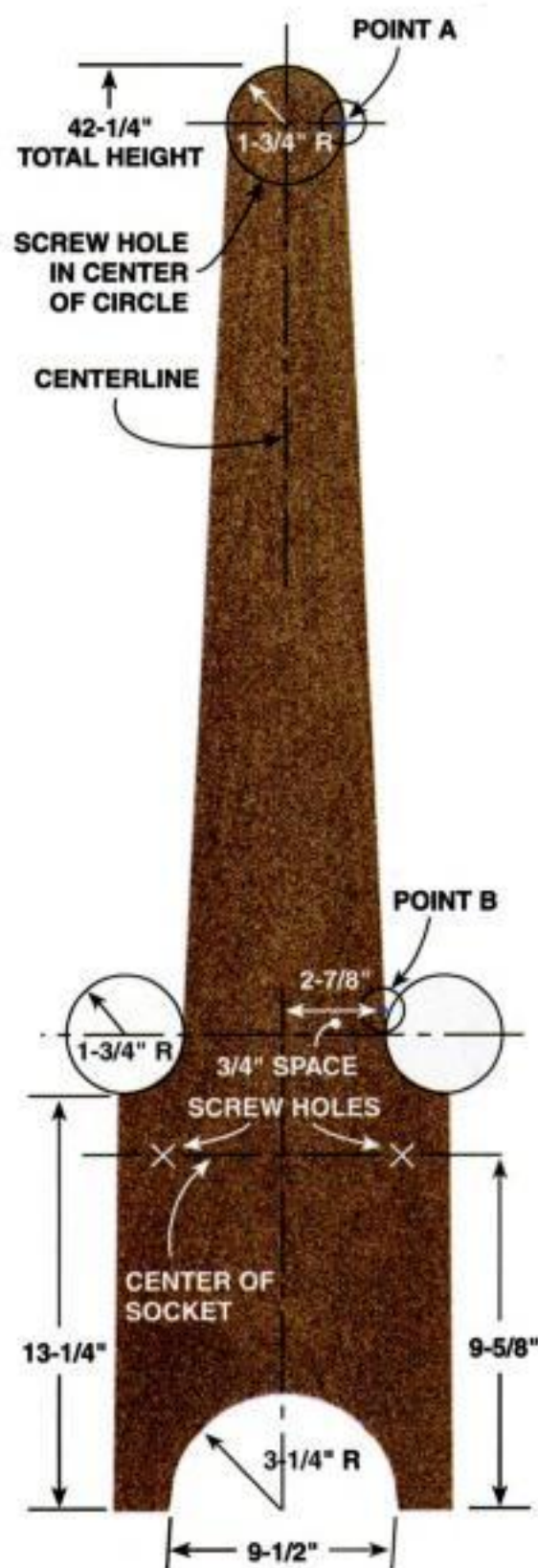
You'll need about six board feet of lumber (about \$25), to make this stool. The one in these photos is made of cherry, but any wood will do, including pine. You'll also need some tempered hardboard,  $\frac{1}{4}$  in. and  $\frac{1}{2}$  in. plywood for the jigs and a router and router table. After you've made the jigs and tried them out, set aside one weekend to make the stool.

You'll find three different kinds of dovetail joints in this stool: a tapered sliding dovetail that goes across the grain, through dovetails and straight-sliding dovetails that go with the grain.

## Preparing the Wood

Flat wood is essential for successful dovetailing. Boards that are cupped across the grain will be nothing but trouble. Mill rough lumber to  $\frac{7}{8}$  in., taking an even amount off both sides. Sticker the boards so





**Fig. A  
Back  
Template**

Rip a piece of 1/4-in. tempered hardboard the same width as the back and crosscut the bottom so it's square to the sides. Draw a centerline from top to bottom. Draw both arches and the two circles that form the curved sides of the back. Mark points A and B. Connect them to form the tapered sides. Draw a freehand curve to connect each circle with the taper. This stretches the circle into an ellipse.



## Dovetailed

**1. FOLLOW A TEMPLATE** with a router to shape the back of the stool. The template is the middle layer of a sandwich that allows your router bit to clear the bench top. Shape the stool's front board with the same template.

air circulates all around. After a few days, see if the boards are still flat. Joint again if you have to, and take the wood down to the final thickness of 3/4 in.

Mill the wood for the back, seat and front from one wide board if you can. The cathedral arch figure will then flow nicely from one piece to another, especially if you center the arches down the middle of the board. Set aside some extra wood for setting up dovetailing operations. Make sure all your wood is exactly the same thickness.

### Making the Template

A good template for the back is worth the effort. You could lay out the pattern directly onto your 3/4-in. wood, but smoothing and sand-

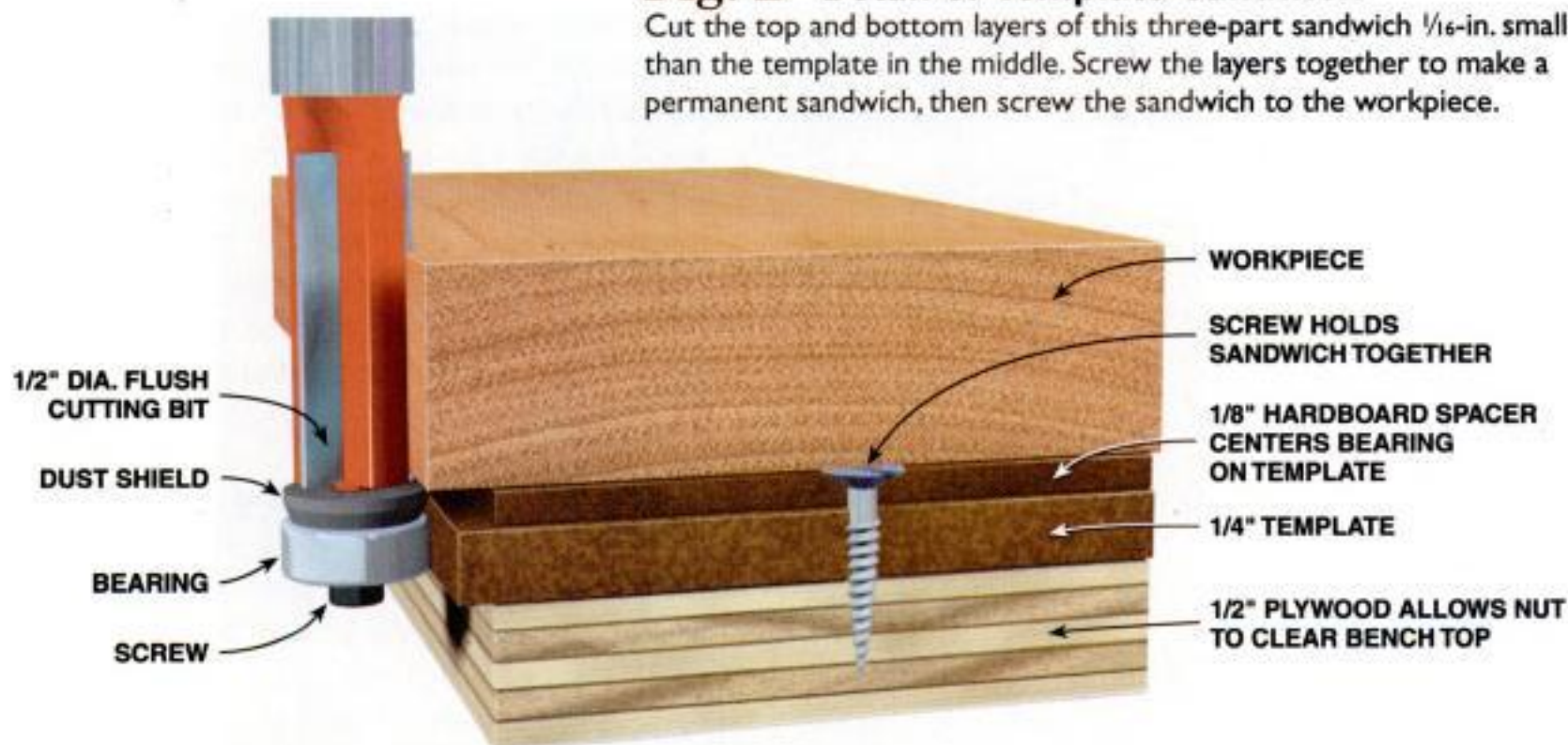
ing it will take more time than preparing a thin template. And having a template will allow you to make multiples.

Make the template from 1/4-in. tempered hardboard, a material that's tough but easy to shape. A router bearing won't dent it. Cut the hardboard with a jigsaw or bandsaw. Smooth the roughly cut curves with a half-round file. Use a block plane to straighten the sides. Run your hand around the template feeling for any hills or valleys. A smooth template will pay off in a back that needs only a light sanding.

This template is the middle layer of a wonderful router jig that puts the bit right where you want it (Fig. B). Cut the top and bottom

**Fig. B Detail of Template Sandwich**

Cut the top and bottom layers of this three-part sandwich 1/16-in. smaller than the template in the middle. Screw the layers together to make a permanent sandwich, then screw the sandwich to the workpiece.



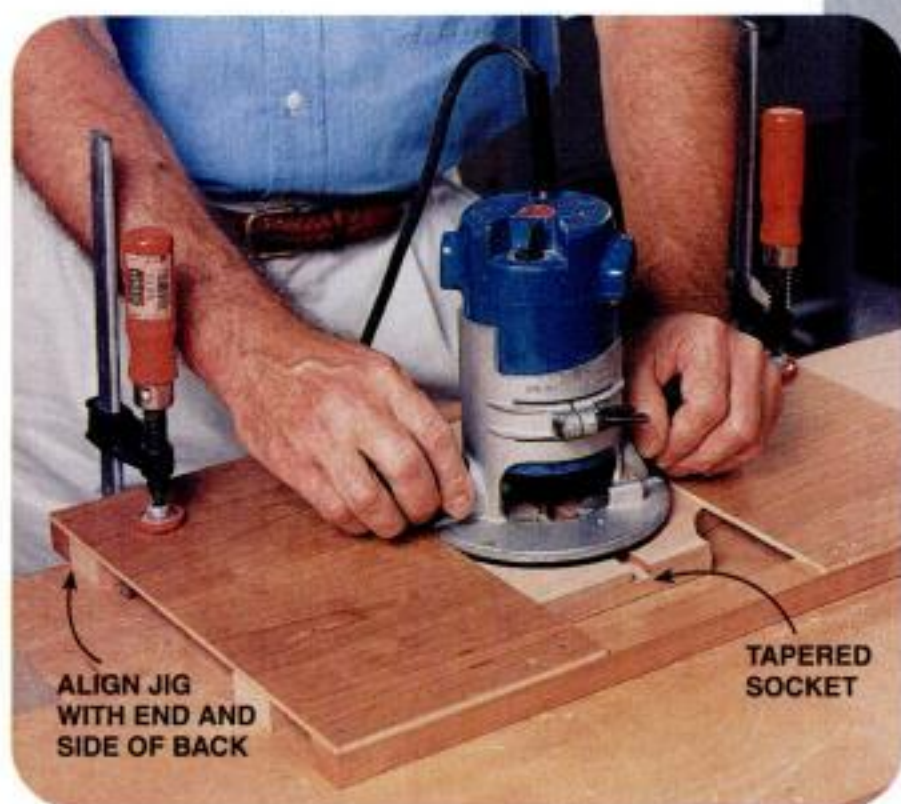
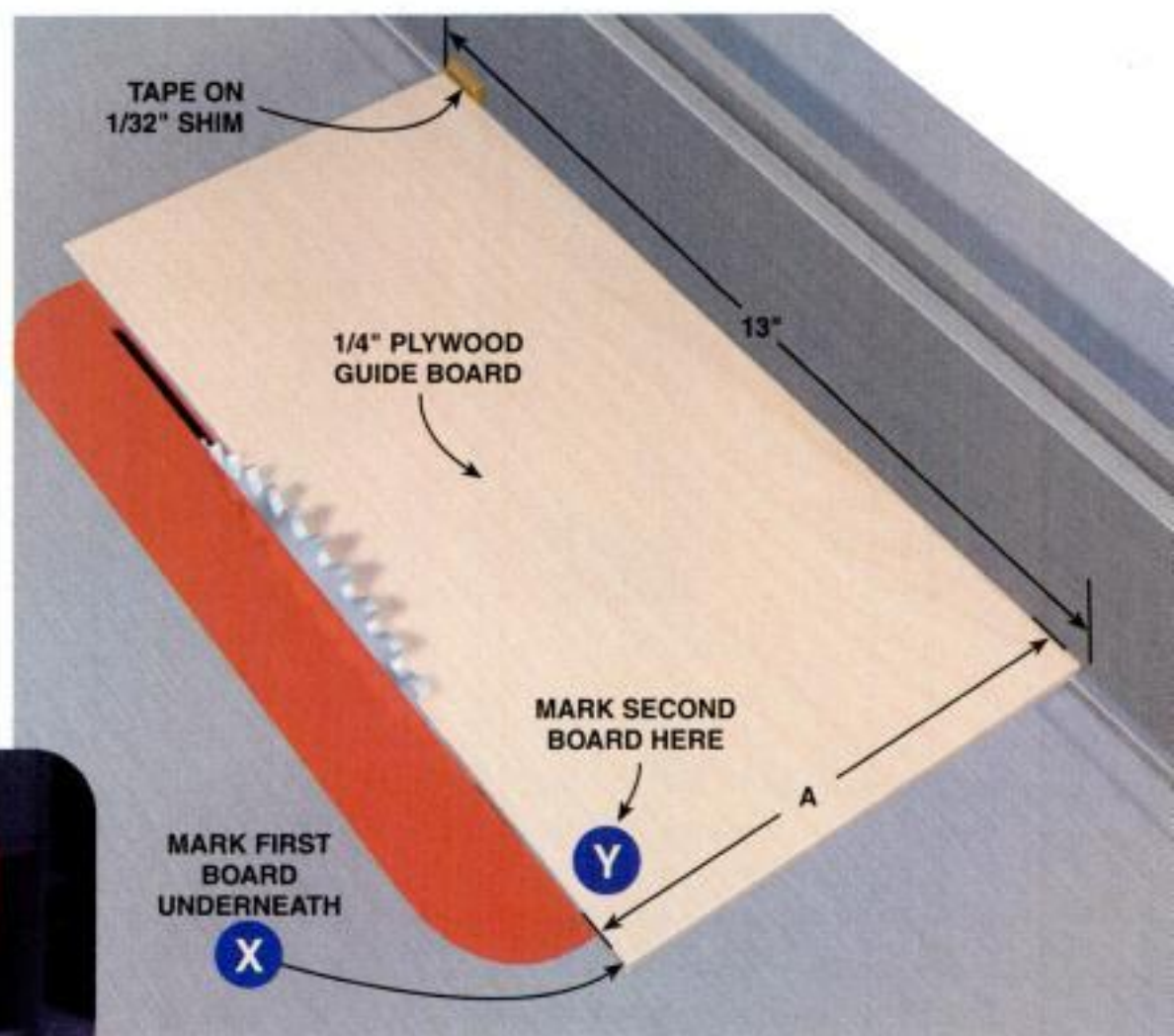


## Fig. C

### Tablesaw Tapering Technique

Taper the guide boards for the socket jig on the tablesaw. Here's how to size them to fit your router base. Subtract the radius of the base from 9 $\frac{5}{8}$  in. to get distance "A." Rip two pieces of  $\frac{1}{4}$ -in. plywood to this width.

Tape a  $\frac{1}{32}$ -in.-thick shim onto the corner edge of each piece. Put this edge against the fence and rip the pieces again. Remove the shim and mark the wide side with an "X" on the bottom corner. Cut the second piece the same way and mark "Y" on the top.



**2. CUT A PERFECT TAPERED SOCKET** with this simple jig. The two pieces of plywood are tapered, so the opening between them is wider at one end than the other.

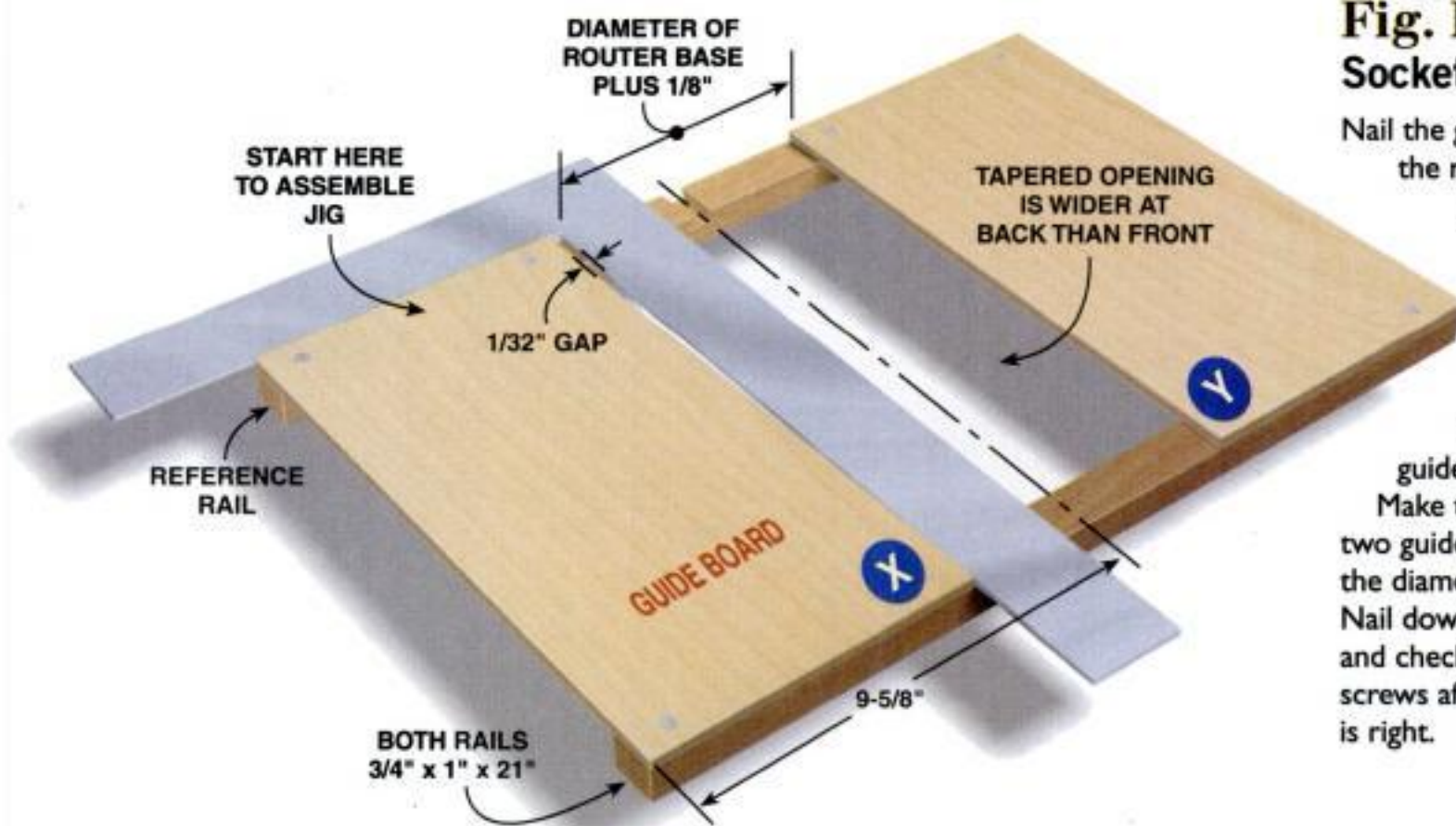
layers undersize and leave them rough. Screw the three layers together. Drill holes through the sandwich for screws that will hold it to the back. When you drill the finger hold and rout the dovetail socket you'll remove the pilot holes made by these screws.

### Shaping the Back and Front

Rip the solid wood for the back, seat and front to the same width. Crosscut the back board a bit longer than its final length. Align the template with the bottom end of the back and trace around it. Saw out the back, staying at least  $\frac{1}{16}$ -in. away from the pencil line. Fasten

## Fig. D Tapering Socket Jig Assembly

Nail the guide board marked "X" to the reference rail of the jig. (Be sure the "X" goes in the right place.) Align the guide board with the end and side of the rail. Use a framing square to check your alignment. Then nail the guide board to the second rail. Make the opening between the two guide boards  $\frac{1}{8}$ -in. wider than the diameter of your router base. Nail down the second guide board and check its alignment, too. Put in screws after you're sure everything is right.





**3. CUT THE SEAT DOVE-TAIL** on a router table. Shim both sides of the seat to make the same taper as the socket. Adjust the fence by trial and error, using scrap wood to test the cut.



the template sandwich to the *face side* of the back board. Clamp the whole assembly down to the bench.

Rout around the back in a counterclockwise direction (Photo 1). You'll have to re-position the back to avoid bumping into the clamps, but make sure you rout each curve in one continuous pass.

Rout the front board's arch in the same manner. You won't be able to screw the sandwich to the board, so use clamps instead.

### Tapered Sliding Dovetail

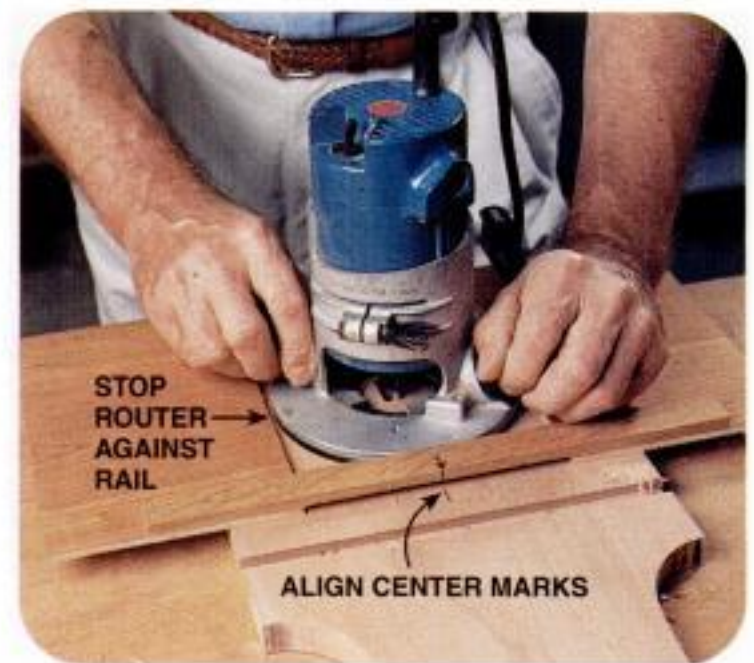
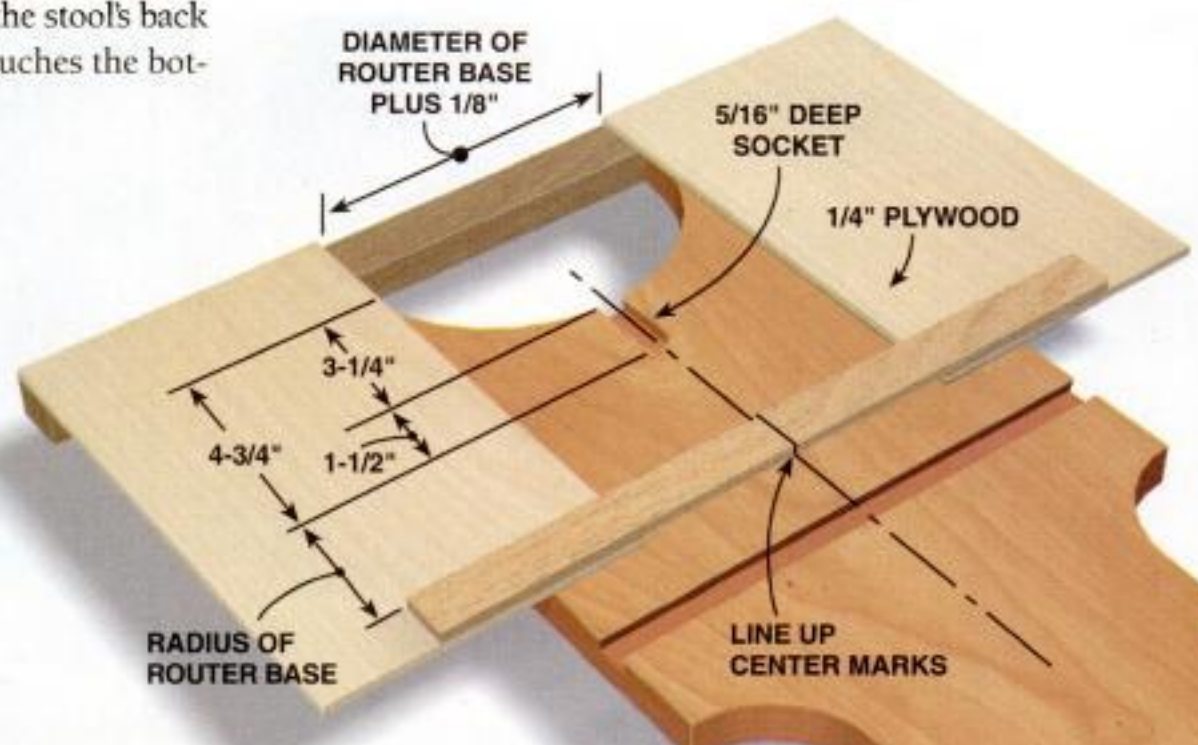
The seat is joined to the back with a long sliding dovetail. Both the pin and socket are tapered. This joint is easier to fit and glue up than one that isn't tapered. The pin slides easily into the front of the socket. The last inch is the only tough part—you'll have to push hard to get the joint home. You'll be amazed with the strength of this joint!

A tapered dovetail sounds difficult to make, but it's really quite easy. The secret is to create all the tapers with one shim that's about  $\frac{1}{32}$ -in. thick. Make the tapered socket with a fool-proof jig (Figs. C and D). Use a standard  $\frac{1}{4}$ -in. shank dovetail bit with a 14-degree pitch and  $\frac{1}{2}$ -in. width. Clamp the jig down and rout away (Photo 2).

Make the long pin that slides into the socket on the router table (Photo 3). Adjust your router so it cuts a  $\frac{3}{16}$ -in. pin, exactly the same length as the socket is deep. The easiest way to do this is to unplug the router, lay the stool's back on the router table and raise the bit until it touches the bottom of the socket.

### Fig. E Straight-Socket Jig

Make a straight-sided jig to fit your router. The position of the front rail determines how long the socket will be. Add  $4\frac{3}{4}$  in. to the radius of the router base to locate the rail. Make the opening of the jig larger than the router base. After assembly, mark the center of the front rail.



**4. ROUT THE STRETCHER SOCKET** with a second jig. This is a straight sliding dovetail. The jig's opening has parallel sides. When you bump the router into the top rail, you've reached the end of the socket.

Tape shims onto both faces of a test piece to create the same taper as the socket. Try sliding the test piece into the socket. It should start easy and gradually tighten up. You should be able to pound it home with your fist. Adjust the fence to change the fit. When it's right, rout the real seat.

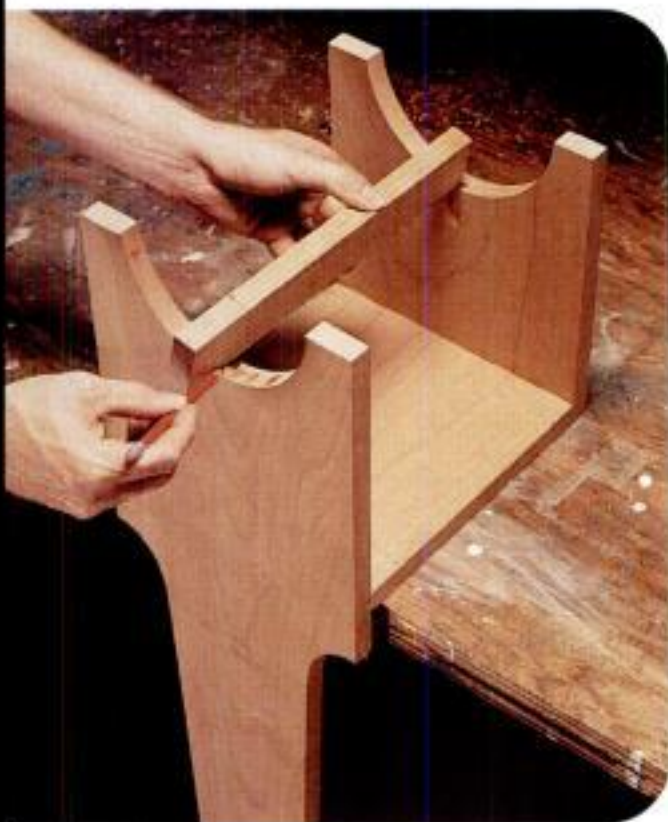
Once the socket is cut you'll know exactly how long the front board must be. Slide the seat in place and measure from the bottom of the back to the top of the seat. Cut the front board to length.

### Through Dovetails

The strongest through dovetails are fairly large in section. The width of a full pin should be about the same as its thickness, in this case,  $\frac{3}{4}$  in. The half-pins at either end of the joint should actually be a bit more than half the size of a full pin. Here they're  $\frac{1}{2}$ -in. wide. The tails should be clearly larger than



# STEP STOOL



**5. MARK THE LENGTH** of the stretcher directly from the stool, which is not yet glued together. Cut the stretcher and dovetail the ends on the router table.

the pins for the joint to look right, but the exact proportion isn't important.

I cut my dovetails by hand (see "Four Tips for Dovetailing by Hand," p. 42). I can make them any size to fit the situation. You can use your favorite router jig to make through dovetails, but if it's a jig with fixed spacing you might have to alter the width of the stool a bit to make the pins and tails work out. In that case, be sure to lay out the spacing *before* you mill your lumber.

Glue the front to the seat. Check for square. Plane or sand the dovetails flush. It's easier to hold two pieces in your vise now than the whole stool later.

## Non-Tapered Sliding Dovetails

A stretcher just above the arches locks in the front and back, making a rigid structure. This sliding dovetail isn't tapered because a taper isn't really necessary over this short distance.

Make another socket jig to guide the router (Fig. E). Again, you'll need to size it to fit your router. Cut both sockets (Photo 4).

## Sources

Video: "Dovetail a Drawer with Frank Klausz." Part #19D51; \$19.95 from Woodcraft Supply; (800) 225-1153.

One-half in. dovetail bit from MLCS, Part #5405; \$7, free shipping; (800) 533-9298

## CUTTING LIST Step Stool 42 1/4" H 9 1/2" W 11 1/2" D

| KEY | QTY | PART      | TH   | W     | L       |
|-----|-----|-----------|------|-------|---------|
| A   | 1   | Back      | 3/4  | 9 1/2 | 42 1/4  |
| B   | 1   | Seat      | 3/4  | 9 1/2 | 11      |
| C   | 1   | Front     | 3/4  | 9 1/2 | 10      |
| D   | 1   | Stretcher | 3/4  | 1 3/4 | 10 1/2  |
| E   | 2   | Rails     | 5/16 | 1 3/4 | 11 7/16 |

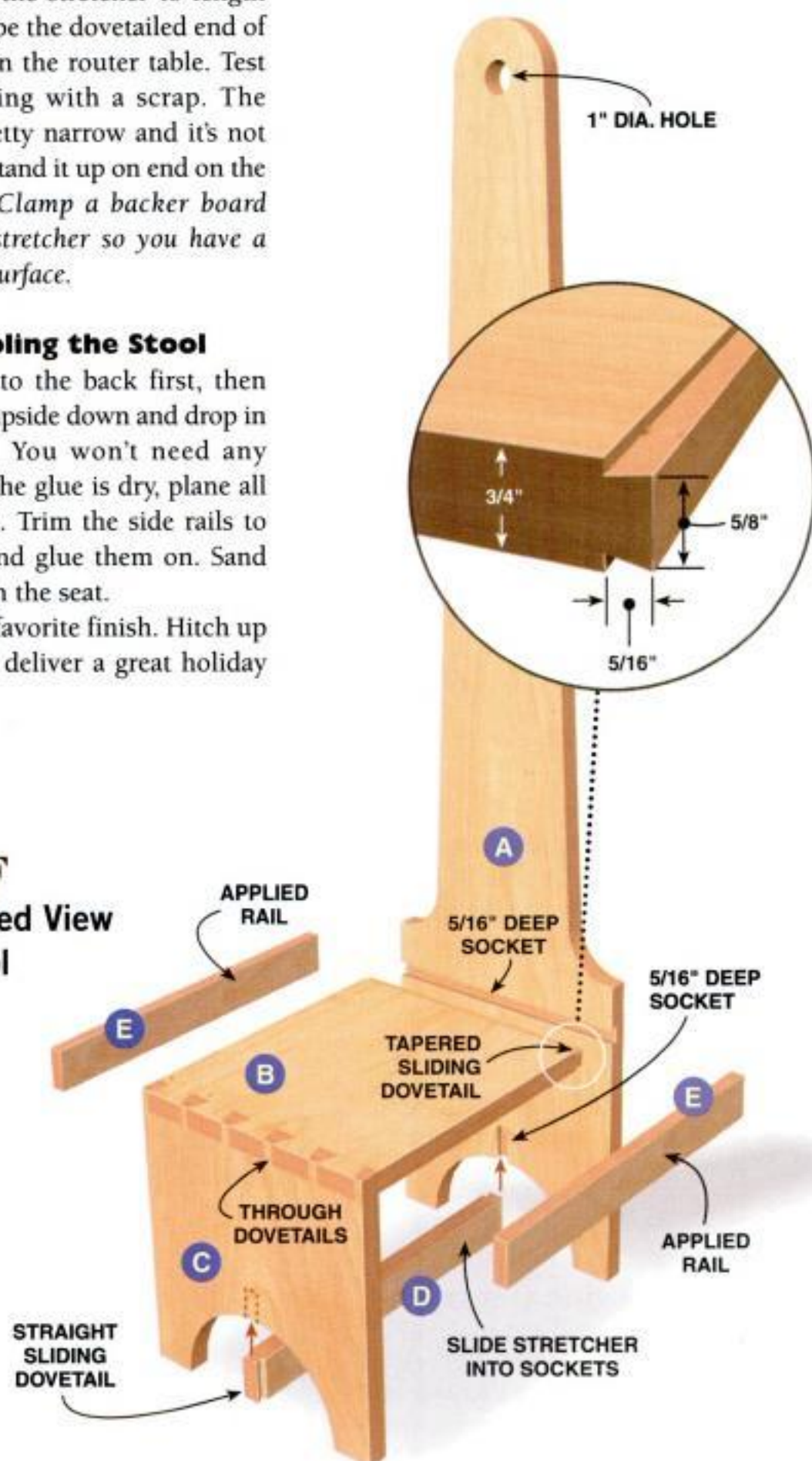
Assemble the stool without glue before cutting the stretcher to length (Photo 5). Shape the dovetailed end of the stretcher on the router table. Test the fence setting with a scrap. The stretcher is pretty narrow and it's not safe to merely stand it up on end on the router table. *Clamp a backer board alongside the stretcher so you have a wider bearing surface.*

## Assembling the Stool

Glue the seat to the back first, then turn the stool upside down and drop in the stretcher. You won't need any clamps. After the glue is dry, plane all the sides flush. Trim the side rails to exact length and glue them on. Sand them even with the seat.

Apply your favorite finish. Hitch up the sleigh and deliver a great holiday gift! **AW**

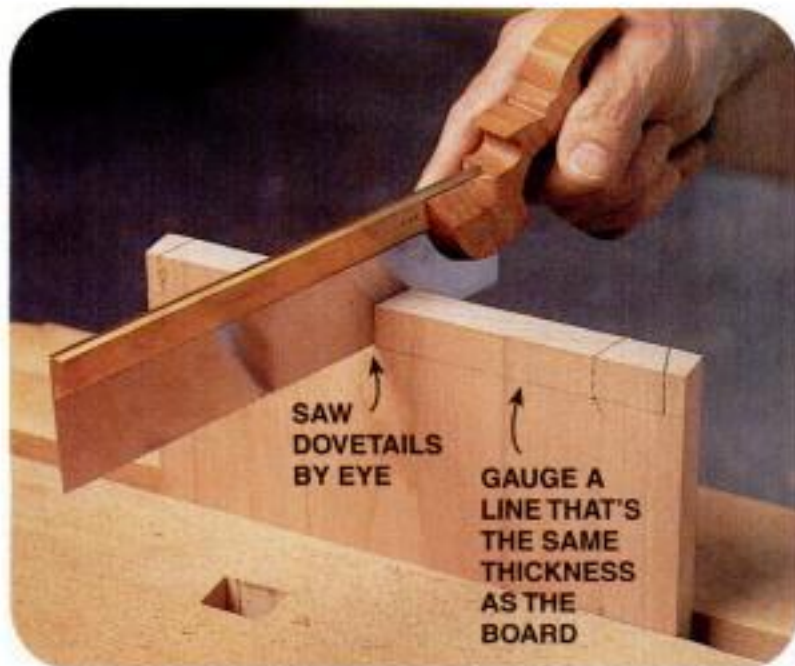
**Fig. F**  
Exploded View  
of Stool





# 4 tips from Frank Klausz for dovetailing by hand

*Frank Klausz*



## tip 1 Cut by Eye

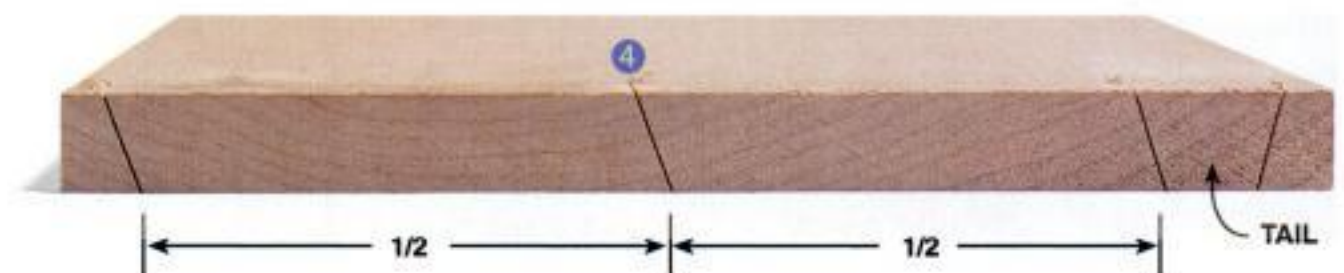
When dovetailing by hand, be bold. Don't bother with a try square or sliding bevel. After gauging a line across the board, lay out the pins with your saw as you make each cut. Trust your eye to find a pleasing dovetail angle and repeat it over and over. Trust your hands with a sharp saw to cut straight down. If you've never done this before, let go of your anxiety and just do it. Practice, practice, practice. You'll be amazed at how easy it becomes.

I'm not worried about the exact sizes of the pins or the spaces between them. In fact, a little variation is a good thing. Your right and left hands aren't perfectly symmetrical, so it's okay if your dovetails aren't, either.

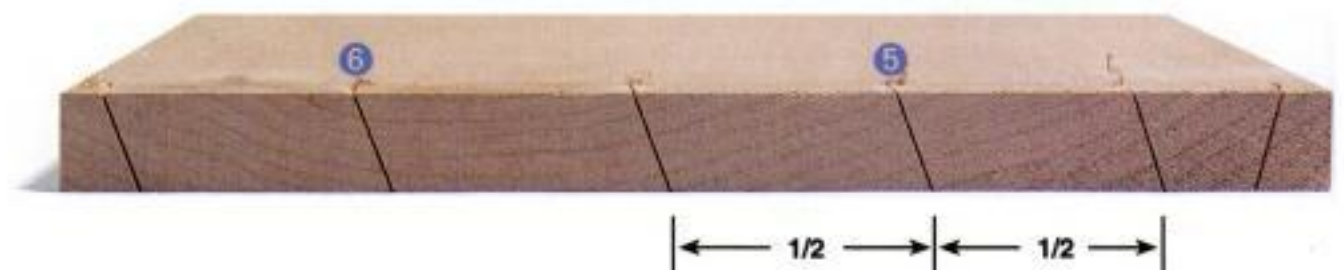
**I FOLLOW** a "rule of halves" when I saw the pins. First I cut the two outer half pins. Next I cut the other side of one tail.



**THEN I EYEBALL** half the distance between the tail and half pin and make another cut.



**I DIVIDE** the remaining spaces in half again.



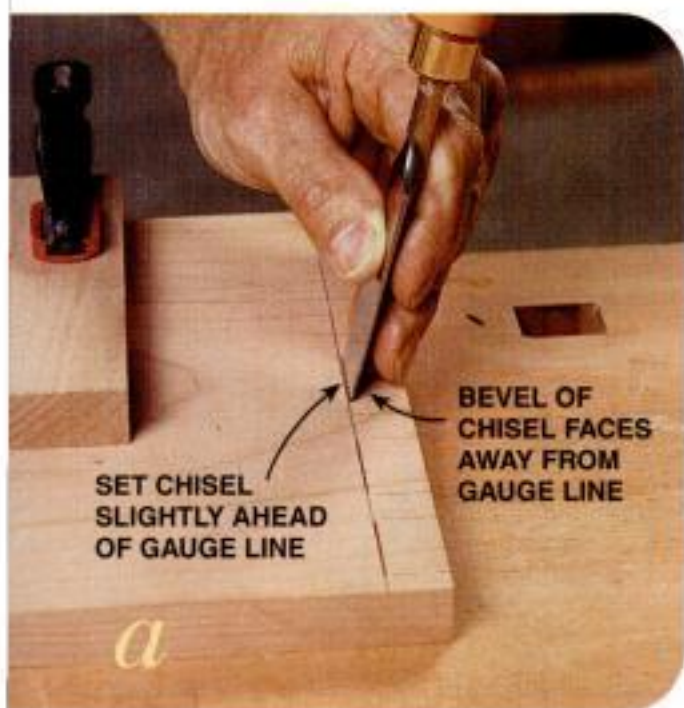
**TURNING THE SAW** in the other direction, I saw each complete pin. I judge their width by looking at the thickness of the board.



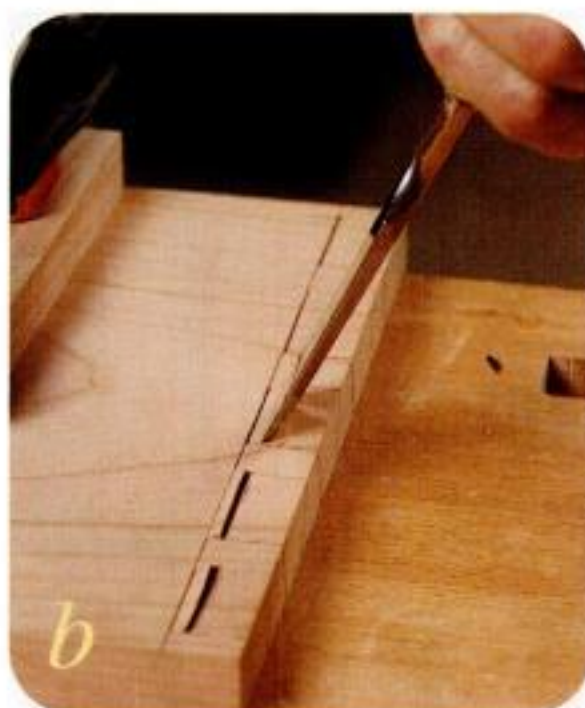


## tip 2 Chop with Vigor

*"I chop out the pins like there's no tomorrow. Good, solid blows on a very sharp chisel get the job done in no time."*



**TO START**, I plant the chisel very close to the gauge line, but not exactly on it, and give it a whack with a round-headed mallet. The slope of the chisel's bevel carries it right into the line. Experience tells me how far to set it away from the line. I march across the board, repeating the same cut.



**NEXT COMES** a sloped cut that defines the shoulder. The chisel is facing the same direction. That's an economy of movement common to all good handwork. This cut carries the chisel pretty deep, almost up to the first cut.



**A COMBINATION** of vertical cuts and sloped cuts remove most of the waste. Actually, I lean the vertical cuts. This "undercutting" saves a lot of time in cleaning up the dovetails.

Notice that I leave a flat spot at the end of the waste. If you've ever torn out the interior of a hand-chopped dovetail, you'll appreciate this tip. I chop halfway down one side of the board, brush away the chips and turn the board over. The flat spot supports the waste so there's no tear out.

*"Woodworking is supposed to be fun!"*

## tip 3 Mistakes Happen —Just Fix 'Em



**DON'T WORRY** about making a few mistakes. Learn to fix them. Here I had to insert a thin wedge in the joint to make up for a mistake in cutting. While the glue was still wet, I sawed out a couple of wedges and lightly tapped one into an open joint. After the glue dried, I cut the end of the wedge off.

## tip 4 Level Quickly



**I USE A PLANE** to clean up dovetails. When finely set and super sharp a plane slices right across the end grain leaving a smooth, flat surface that you can't get with sandpaper. I plane from the corners into the middle and take out any ridges the plane may leave with a cabinet scraper. **AW**

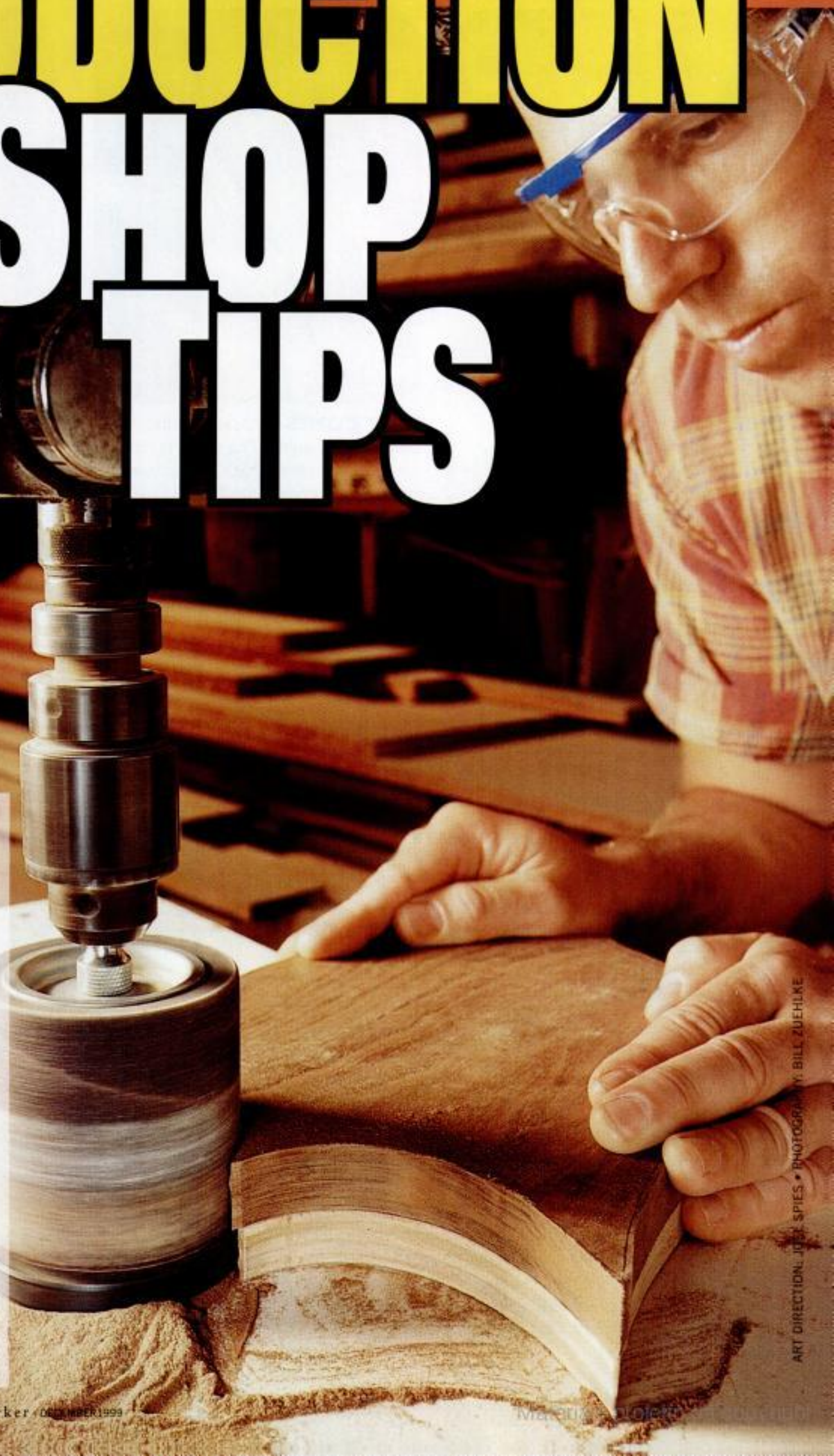


By Rick Christopherson

# PRODUCTION SHOP TIPS

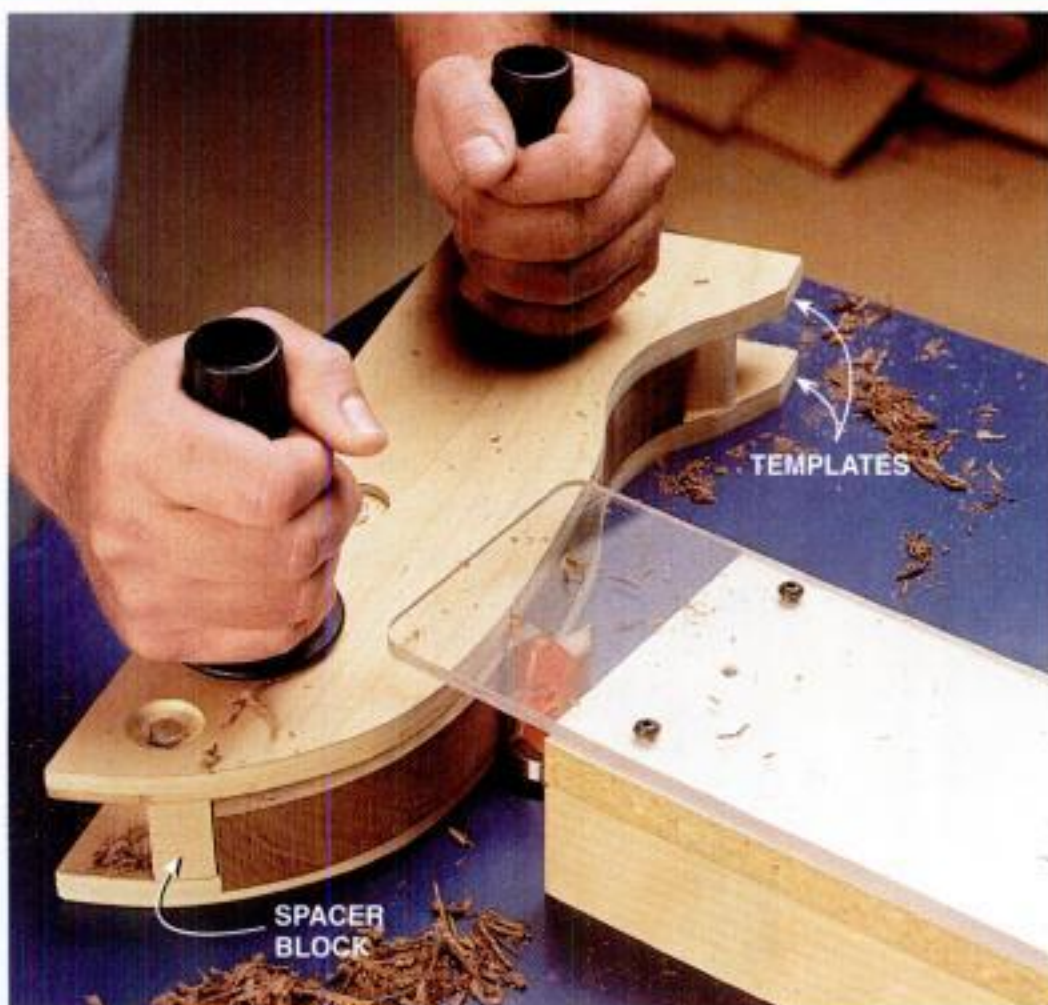
**Make  
identical  
parts  
quickly,  
accurately  
and safely.**

You probably have no desire to turn your shop into a factory, but even so, it's handy to know some tricks for turning out lots of identical parts. Maybe all of your multiples will go in one complicated piece of furniture, like eight matching turned legs, or maybe you're making a birthday present and you figure that while you're at it, you might as well make a few holiday presents, as well. Most people know how to use a router to cut parts from a pattern (see photos on pages 45 and 49) but here's a batch of more unusual tips to help you make multiple parts quickly and accurately.



ART DIRECTION: JOEY SPIES • PHOTOGRAPHY: BILL ZUEHLKE

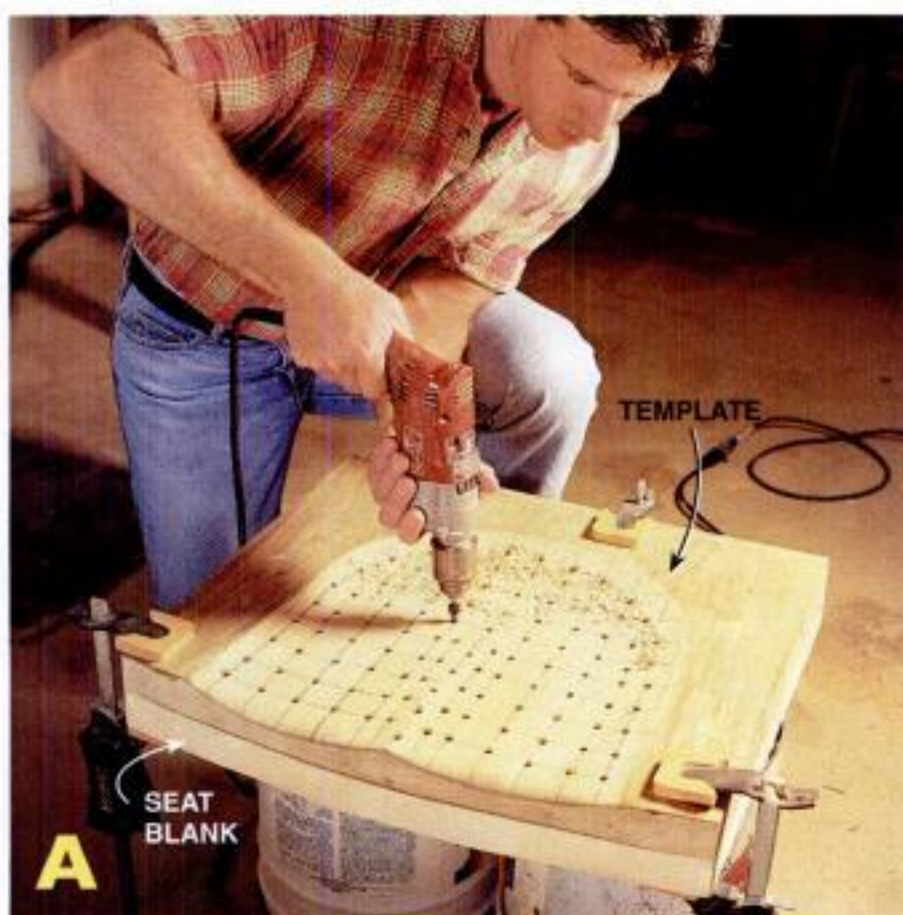




## Sandwich Clamp for Routing

Use a sandwich clamp to hold your workpiece without screws or when you need to have a template on both sides. A sandwich clamp also allows you to flip the whole clamp and workpiece over and work from the other side. This is a good way to avoid tear-out when routing, because you can always cut "downhill" with respect to the grain of the wood.

To make the clamp, start with two identical plywood templates of the shape you want. Then add some spacer blocks to separate the two pieces. These spacers should be slightly thinner than your workpiece. Drill and countersink holes for bolts and T-nuts. These should be flush on both sides so you can flip the clamp over. For added safety, handles can be added. These are held in place with T-nuts or threaded inserts. The handles can be borrowed from a couple of power tools or you can buy small handles for about \$2 apiece ([see Sources, p. 49](#)).



**DRILL THROUGH THE TEMPLATE** into the seat blank with a drill bit and stop collar. The depth of the holes will follow the contour of the template.

## Duplicate Chair Seats

Whether you're repairing a broken antique or making a set of dining chairs, duplicating a scooped seat can be difficult. Here's a clever way to make it easier: Use a template (for example a comfortable seat from a beat-up old chair) and clamp it to your seat blank. Drill right through the template



**REMOVE MATERIAL** to the depth of the drilled holes. We used a power carver attachment on a grinder for roughing out the shape of the template.

and blank, using a drill with a stop collar, set so the hole you drill in the blank is the correct depth for the scooped out part. A series of holes will give you a guide, so that when you carve out the seat (we used a power carver on a grinder) you know just how deep to go. A common approach is to drill holes on the important contours like the center peak and the deepest sections and then every inch or two over the rest of the seat.

For more ideas on shaping chair seats, read "The Chairmaker's Workshop," by Drew Langsner, 1997, McGraw-Hill; \$34.95; (800) 733-3000.





## Pneumatic Clamps

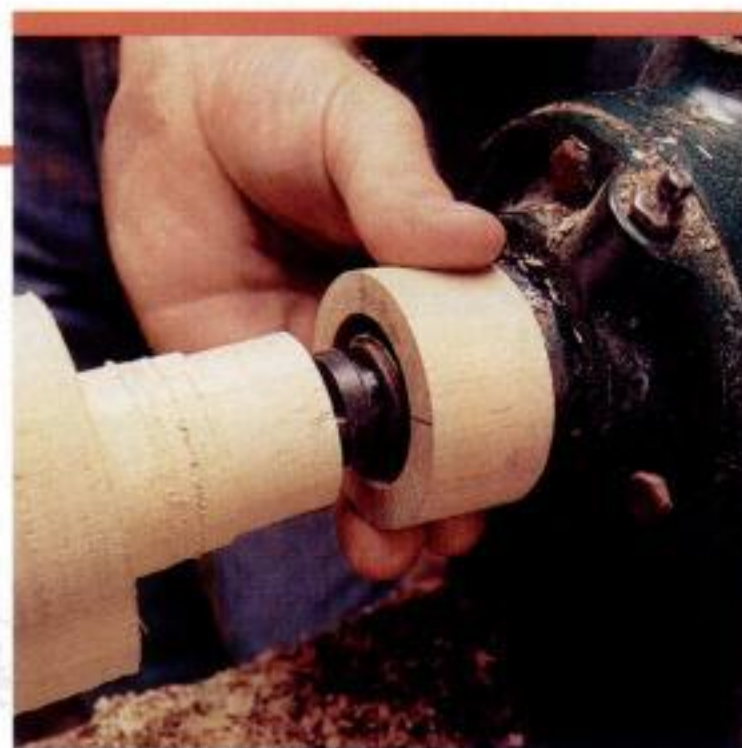
Air-powered clamps are the ultimate in speedy clamping. Obviously they're best suited for operations where the cutting itself is fast, but the clamping can take a long time. Pneumatic clamps come in different shapes and sizes, costing between \$75 and \$150 ([see Sources, p. 49](#)). They perform the same tasks as toggle clamps, except they're automated. A foot pedal controls the air supply and even a small air compressor can run them.

A pneumatic clamp holds down door rails for machining the ends. The pad on the clamp spans across both rail pieces to hold them quickly and securely. It can also hold one rail and a backer piece to reduce tear-out.

## Go/No-Go Gauges

Check parts for size, fit or alignment with shop-made, go/no-go gauges. The principle is that a part will either fit the gauge or it won't—hence the name. When the part fits in the gauge, it is the correct size (unless you goof and get it too small!).

Go/no-go gauges are common in lathe work and chairmaking to check the size of round tenons (see photo). Cabinetmakers use these gauges to check frame and panel door components to make sure the panel's tongue fits the frame's groove, and that cope and stick profiles align flush. Any operation that requires parts to mate can benefit from using go/no-go gauges.

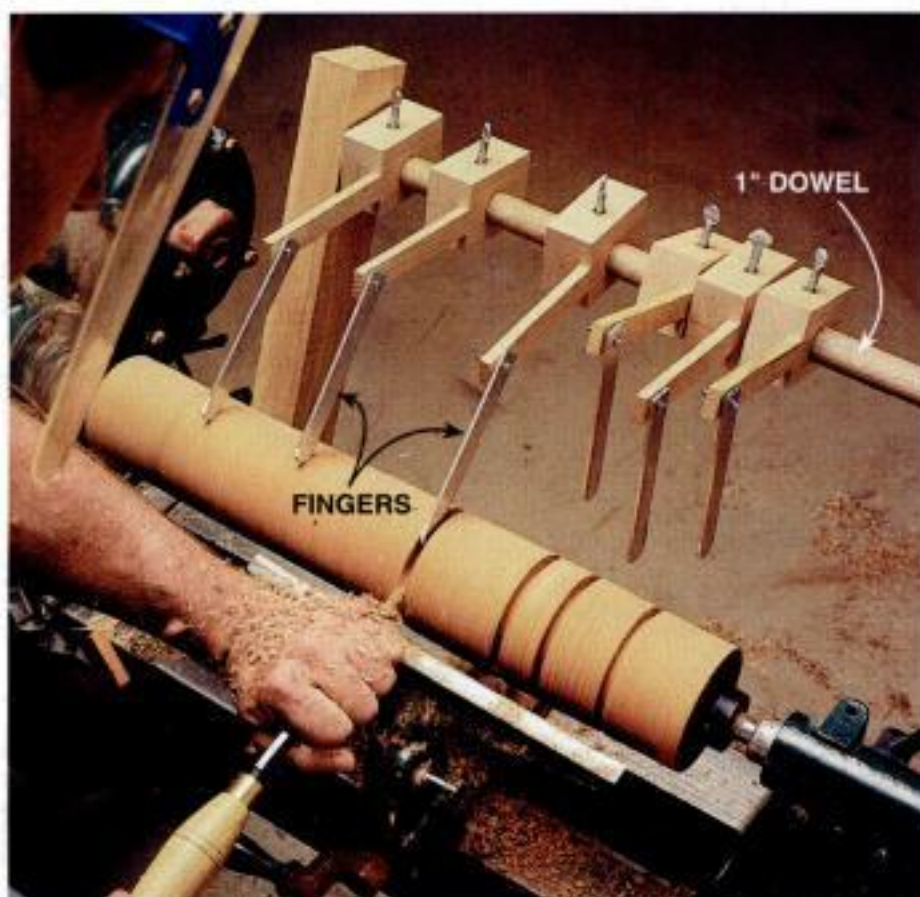


## Template Cutting on the Tablesaw

If you have a lot of parts with cuts at odd angles, template cutting on the tablesaw can make fast work of them. Add an extension fence (see photo) to your tablesaw fence and set it so the edge is flush with the outside edge of the blade and slightly higher than the thickness of your workpieces. Make a template of the shape you want and attach it to your blanks with double-sided tape, hot-melt glue or a couple small screws. You can also simply glue coarse sandpaper to the bottom of the template so it grabs the blank well. For added safety, attach a handle to the top of the template. Now run the template against the fence, swiveling it to do all sides, and your piece is cut. Be careful about the cutoff pieces that will accumulate under the extension guide. Poke them through with the saw turned off.







## Duplicate Spindles with a Semaphore Jig

A semaphore jig performs the same task as a story stick and caliper (p. 48) but it is more automated. With this jig you don't need to place pencil lines on the blank, nor do you need to have a caliper. Each arm of the semaphore jig rides on the surface of the rough spindle. When you part down to the correct diameter at each location, the arm swings all the way through. An adjustable semaphore jig can be reused for other turnings, so spending a little extra time making one can pay off in the long haul.

I built this adjustable semaphore jig in about 3 hours and all of the parts were available from my local hardware store for less than \$20. The number of arms you make depends on the complexity of your turnings—make as many as you need. To make this jig, first I took a piece of 2-in. wide by 1½-in.-thick maple and dadoed a ¾-in. wide by ⅝-in.-deep groove down the middle. I cut this board into 3-in. lengths. Then I glued the 8-in.-long arms into the dadoes. After the glue was dry, I drilled 1-in.-dia. holes through the blocks for the 1-in.-dia. dowel. Each thumb-screw is screwed into a threaded insert and acts as a clamp against the 1-in. dowel. The fingers are made from ⅝-in. by ¾-in.-aluminum bar stock, and held onto the arms with No. 8 machine screws, nuts and washers.



## Gang Planing

A great way to get lots of boards to exactly the same width is to run them through the planer together, on edge. You might do this for face frame material, for example, or the stile on a set of doors. Rip the boards, then joint one edge on each. Take four or five boards and stack them together so the grain direction on each board is sloping the right direction for clamp-free cuts (the cutters spin "uphill" on the grain). Then run them through the planer as a group. Keep the boards from stalling by squeezing them together tightly, but watch your hands; it's tempting to hold on too close to the machine. If in doubt, use clamps to hold the stack together.

## There's Danger in Numbers

Repetitive work is deceptively dangerous. You're cutting part after part after part after part and your mind starts to drift off, then POW—something goes wrong. Because of this repetition, making multiples is more dangerous than normal woodworking. Make a point of safety:

Use guards and good clamps that keep your hands away from blades and cutters. Take frequent breaks to relieve the tedium. And avoid the temptation to work too fast when a jig or fixture seems to make the operation foolproof.



## Template Sanding

A guide bushing on a drum sander transforms it into a template sander. It allows you to create numerous curved parts with sanded edges and is especially useful for softwoods or figured woods that splinter or chip when cut with a router. You don't need to follow a pencil line and the drum sander doesn't leave the annoying ripples that are so common when you're freehand drum-sanding. You can buy drum sanding attachments for a drill press that have built-in guide bushings ([see Sources, p. 49](#)), which we show in the photo, or you can make your own. To make one, cut a circular disk out of plywood the same diameter as your drum and secure it with screws to a piece of plywood. Attach the plywood to your drill press table so the disc is directly under the sanding drum.



## Turning Duplicates With a Story Stick

The most common way to make duplicate turned spindles is to use a story stick and calipers. The story stick has marks to indicate where transition points are, such as the valley of a curve, or a shoulder between two shapes. With the lathe spinning, transfer these marks to the rough spindle with a pencil. Then cut down to the correct diameter for that location with your parting tool. Once you have all of your transition points parted to diameter, shape the profiles in between.

## Eccentric Cam Clamp

Use an eccentric cam clamp when you need a fast acting, dual-action clamp. It holds the workpiece down and pushes it forward slightly at the same time. This is advantageous when you need to draw a piece tight to a stop block or another piece. Best of all, these shop-made clamps are free—just make them out of scrap plywood.





## Small Offcut Holding Spring

Often the hardest pieces to cut in quantity are small ones. They're hard to keep from binding against the saw blade and shooting out like missiles. This simple spring clamp, made from a  $\frac{3}{4}$ -in. pipe hanger and a scrap of wood, will hold the buggers down. The U-shape of the pipe hanger provides enough flexibility to hold the piece down and bending the tab up allows the next piece to slide in freely. Bend the pipe hanger so the end is just slightly below the height of your workpiece. After the cut, you still need to turn off the saw to rescue the little piece, but at least it's still there! I drilled 1-in.-dia. holes through the blocks for the 1-in.-dia. dowel. Each thumbscrew is screwed into a threaded insert and acts as a clamp against the 1-in. dowel. The fingers are made from  $\frac{1}{8}$ -in. by  $\frac{3}{4}$ -in.-aluminum bar stock, and held onto the arms with No. 8 machine screws, nuts and washers.

### Sources

Template-sanding drum kits: Eagle America; (800) 872-2511  
Hartville Tool; (800) 345-2396  
Jesada Tools; (800) 531-5559  
Woodcraft; (800) 225-1153

Auxiliary handles: Woodcraft; (800) 225-1153

Toggle Clamps: Eagle America (800) 872-2511  
Hartville Tool (800) 345-2396  
MLCS; (800) 533-9298  
Tools on Sale; (800) 328-0457  
Woodcraft; (800) 225-1153

Pneumatic Clamps  
For the model shown (clamp: 05-216 at \$117, foot pedal: 05-218 at \$125)  
Her-Saf, Safranek Enterprises; (800) 553-9344

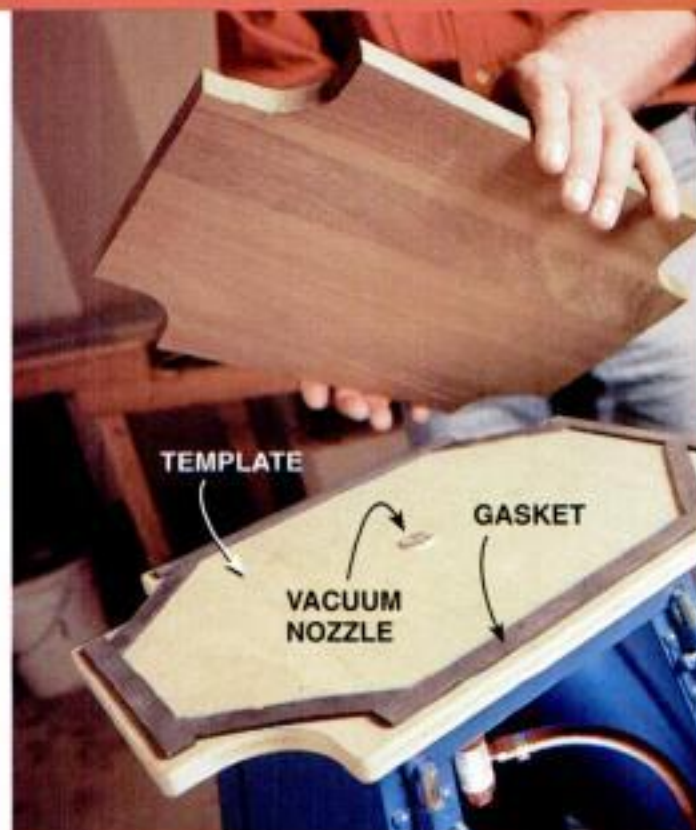
Grainger Check the Web site: [www.grainger.com](http://www.grainger.com)

Vacuum Clamps (Non-template Type: Carter Mini Max ) Woodcraft; (800) 225-1153  
Woodworker's Supply; (800) 645-9292

Vacuum clamps (make your own template) For the model shown (10-382 at \$590)  
Her-Saf, Safranek Enterprises; (800) 553-9344

## Vacuum Clamps

A vacuum clamp can save the day when you need fast, totally obstruction-free clamping. It holds and releases instantly and has surprising strength. The ones we show here work off of compressed air with a \$55 vacuum adapter, and are heavy duty models (\$600 each). Carter also manufactures a \$150 vacuum clamp that runs off a shop vacuum (see Sources, at right). **AW**



**THE VACUUM QUICK-CLAMP** from Her-Saf allows you to make a customized top which serves as both a vacuum clamp and a template.



# spalted wood

When wood is captured somewhere between the extremes of being completely sound and fully rotten, it can display magnificent beauty. The discoloration, prominent black lines and changes in texture that occur during the decaying process are known to woodworkers as spalting.



*by Alan Lacer*

Spalted birch burl bowl by Mark Lindquist, 1987  
Collection of Arthur and Jane Mason





Spalting is a by-product of the rotting process that is carried out by a vast army of stain, mold and decay fungi.

They are abundantly present in the air and soil, waiting for favorable conditions and a suitable host. Generally, wood moisture content of at least 25 percent, temperatures from about 40- to 90-degrees F, air and food (especially abundant in sap wood) are what the fungi need. A tree or branch freshly fallen onto a damp forest floor in warm weather is asking for it.

Lighter colored woods offer the best canvas for nature's graphic work. Hard maple is viewed as the king of spalted woods, although sycamore, persimmon, red and white oak, elm, pecan, birch, buckeye, apple, magnolia, beech, holly, hackberry, box elder and the sapwoods of walnut and cocobolo are favored by woodworkers as well.

### Where to Find Spalted Wood

You can purchase spalted wood—usually maple—from specialty lumber and mail order suppliers (see Sources, p. 53). Turning blocks are most easily found, but a few suppliers offer boards when they can get them.

Hunting spalted wood is like panning for gold—lots of searching for that one precious nugget. Logs rotting on the forest floor, dead limbs and entire dead standing trees are excellent sources. You can also hunt for hidden treasure at a community bone yard of removed trees, and don't overlook the bottom of your old firewood pile.

### Make Your Own Spalted Wood

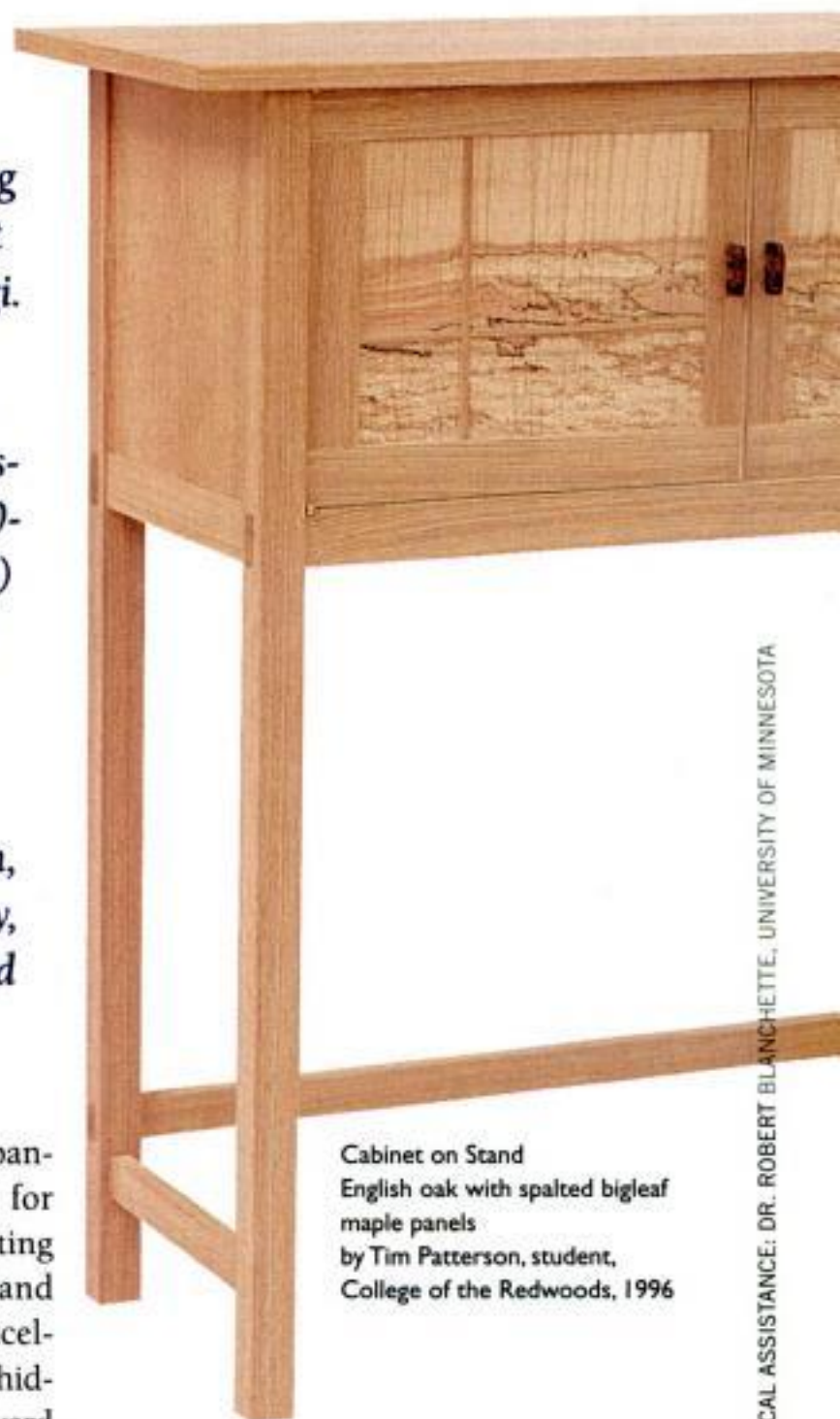
Woodworkers commonly use these methods to cause wood to spalt. They will work most effectively if the temperature is kept where the fungi will thrive, between 60- and 80-degrees F. Monitor the spalting progress monthly—the optimal conditions you've created can make it happen fast.

- Place a freshly cut log section 2 to 3 ft. long upright on the bare ground. Put a shovel of dirt on the top end and cover it loosely with black plastic.
- Bury a log, freshly sawn green boards or green rough-turned bowls in damp sawdust containing pieces of rotten wood with active fungi. Keep the sawdust moist.
- Use plastic bags or plastic garbage cans to hold short sections of green wood or rough-turned bowls. Adding some soil or rotting sawdust may speed the process, although the fungi already present in the air or on the wood sur-

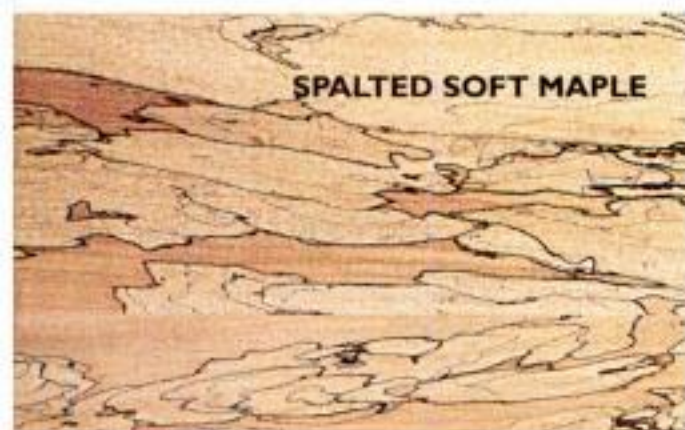
face is probably enough to get it going. Leave the bags or cans with a small opening to allow for some air exchange.

### How to Stabilize Spalted Wood

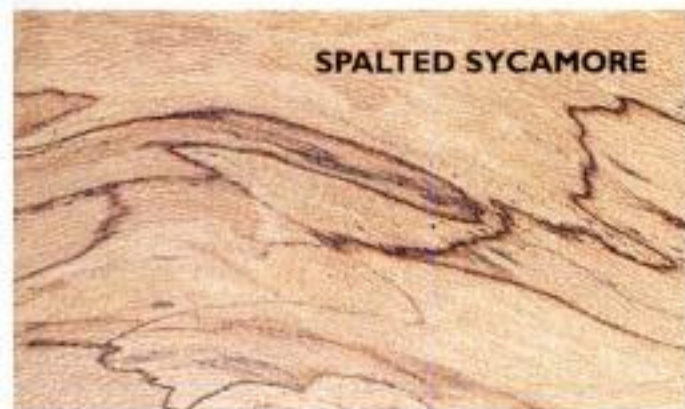
Remove those things the fungi need to grow, and you'll stop its progress. One method is to lower the wood's moisture content. Wood below 25-percent moisture content, when kept in low relative humidity, is not likely to decay or even stain. Accomplish this by air or kiln drying, placing smaller pieces in a microwave or finish turning if the piece was a rough-turned bowl. You can also raise or lower the wood's temperature. Spalting rarely occurs above 90-degrees F and stops below 32-degrees F. Some turners store blanks in a freezer prior to finish turning. Finally, you can restrict the air—no air, no decay. Logs submerged in water, for example, do not decompose from fungi. Tightly wrapping the wood in several layers of plastic will restrict the air and slow the growth of the fungi.



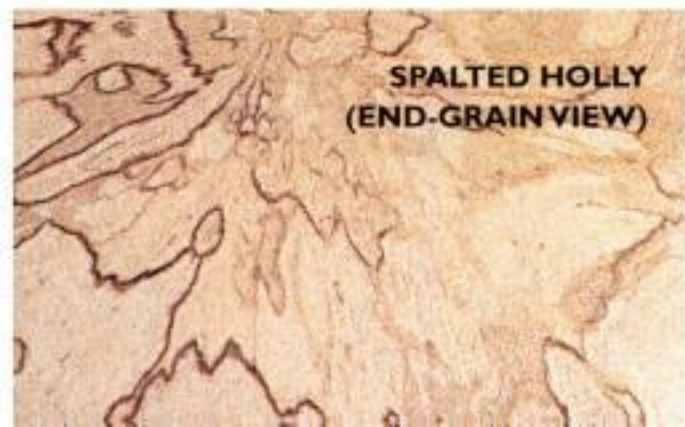
Cabinet on Stand  
English oak with spalted bigleaf maple panels  
by Tim Patterson, student,  
College of the Redwoods, 1996



SPALTED SOFT MAPLE



SPALTED SYCAMORE



SPALTED HOLLY  
(END-GRAIN VIEW)



# spalted wood

## Working Properties

If you're lucky, you'll catch the spalt-ing at the right time, before the cellu-lar structure of the wood deteriorates, and you'll be able to work the piece without any trouble. Sometimes, how-ever, the material will have areas that have become soft and punky. These areas have no strength and defy nor-mal woodworking strategies. They will crumble, tear out in chunks or leave a wrinkled appearance when you try to cut or plane them. They refuse to be glued together, and leave you with a cratered, uneven surface when you try to sand. Though not suitable for

several generous applications to treat each bad spot. These hardeners are effective, but they have side effects. They fill the wood cells, so surfaces treated with them can't be glued and oil finishes don't take well because they can't penetrate. Solvent-based harden-ers and CA glues darken the wood considerably. I like Protective Coat-ings Petrifier (see Sources, p. 53). It's a water-based hardener that doesn't dis-color the wood, yet seals and stiffens effectively. It's an excellent choice for troublesome soft spots.

You should be able to work the stiff-ened surface with edge tools—make very light cuts—or with abrasives, tak-

ing care to pro-vide a firm, flat backing for the sandpaper. Some turners use body grinders or stiff-backed sanding discs and work the piece while it's spinning on the lathe. For flat lumber, an abrasive planer is an excellent option, followed by a random-orbit or pad sander. If you sand by hand, use a sanding block to give firm support to the paper.



Claro walnut box inlaid with spalted end-grain sycamore, bookmatched to form a bird image by Del Stubbs, 1982

## Finishing

You are likely to encounter three prob-lems when you finish spalted wood: Splotching, yellowing and excessive darkening. The whiter woods—which usually have the most dramatic examples of spalting—can turn quite yellow with certain finishes, and because the soft areas act like end-grain or even a sponge, splotching or excessive darkening can result unless the piece is sealed first.

An effective weapon against splotch-ing is clear, dewaxed shellac used as a sealer. (Spray cans of shellac are thinned and dewaxed.) Cover the entire piece with a thin coat and let it dry. Then recoat dull-looking areas until all surfaces have a uniform sheen. You can use almost any finish as a topcoat over dewaxed shellac after it's been sanded.

An active fungus colony surrounds itself with a chemical and physical barrier that defines its outer boundaries. Filaments of the fungus pack and swell in these regions and exude generous amounts of pigmented material that usually appear as black lines. The material in these "zone lines" protects the colony from attack by bacteria, insects, and other fungi, and assists in maintaining a desirably moist atmosphere. Inset: Electron microscope view of a fungus zone line in front of wood cell structures.

joinery, these soft areas can often be stiffened enough to finish so the piece of wood can still be used decoratively.

You can saturate soft areas with a liquid hardener. Where the wood is only marginally soft, a spot coat or two of clear shellac or nitrocellulose sanding sealer may harden it suffi-ciently. A really punky spot will require cyanoacrylate (CA) glue (the thin, watery type) or a product made to stabilize rotten wood. There are a number of them sold as wood hard-eners at hardware stores. It may take



Morris Chair by Rich Gotz, 1998





To minimize yellowing and darkening, use a surface-film finish like clear shellac or lacquer. Waterborne finishes dry clear and don't yellow with age. If the piece is primarily decorative and has few, if any, soft areas, clear wax is appropriate.

If you don't mind the yellowing and darkening, use your favorite oil finish, but be prepared to make many applications to the softer areas. Experience has taught me that an oil-finished spalted piece will appear rather muddy and uneven at first, but will look better as the finish cures, which can take weeks or even months. Some oil finishes (such as General Finishes Sealacell Step 1, see Sources, below) are essentially a thinned, light-colored varnish, and will not yellow as much.

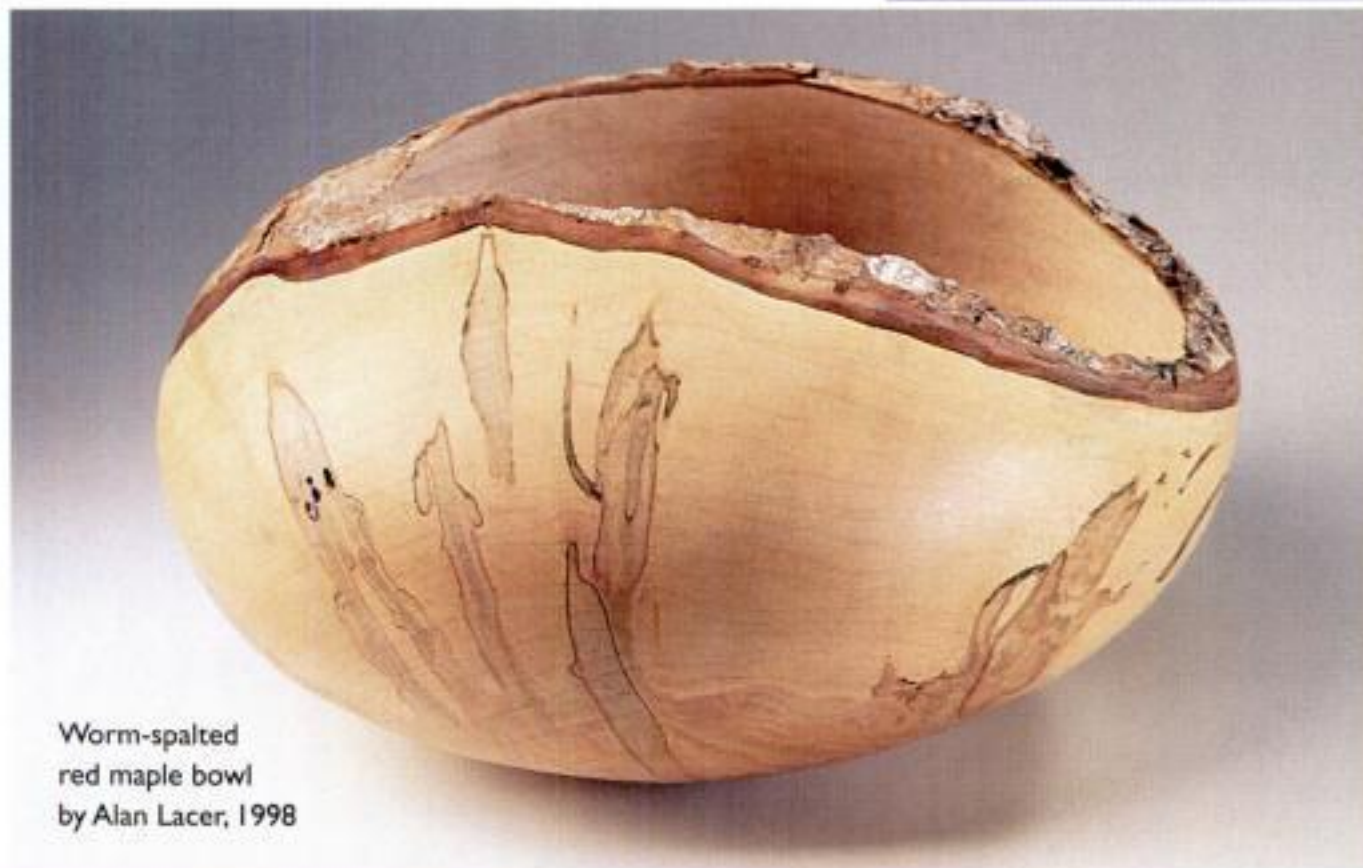
If you are looking for a challenge, and effects that often surpass the wildest woods from the tropics, spalted wood may be your ticket. Each block of wood has its own unique properties that must be judged and worked on its own terms. Use spalted wood and your work will never go unnoticed. Use it well, and you'll produce a real showstopper. **AW**

## Working Spalted Wood Safely

There is anecdotal and some medical evidence that substances from decaying wood are a health threat. Allergic reactions and some serious lung diseases have been traced to spores and fungi that inhabit rotting wood. The effect on an individual woodworker depends on his or her tolerance to the spores and fungi, the concentration of them in the environment and the length of exposure. Persons with weakened immune systems, lung illnesses or who show signs of allergic reactions to the spalted wood should avoid the material altogether. One must err on the side of caution when working spalted wood. Freshly sawn green material with active spores and fungi, or even air-dried material, is potentially the most hazardous. Kiln drying, by turning up the heat and driving out the moisture, will actually kill both fungi and spores.

To avoid breathing spalted wood dust, I strongly recommend that you wear a respirator—not a nuisance mask—and have an effective point-of-origin dust collection system or a self-contained air filtration helmet. Avoid prolonged contact with your skin, and clean your work area thoroughly following any work with spalted wood.

Typical spaltling differs from worm spalt, where the worm hole allows the fungus to enter and work from the inside out.



Worm-spalted  
red maple bowl  
by Alan Lacer, 1998

## SOURCES

### Flat material suppliers:

Northwest Timber  
P.O. Box 1010  
Jefferson, OR 97352  
(541) 327-1000

Randel Woods  
P.O. Box 96  
Randel, WA 98377  
(360) 497-2071

Talarico Hardwoods  
RD #3 Box 3268  
Mohnton, PA 19540-9339  
(610) 775-0400

### Bigleaf Maple:

Mount Cheam Woodworking  
8359 Banford Road  
Chilliwack, B.C. V20GH3  
(604) 795-9297

### Turning stock suppliers:

One Good Turn  
6064 S. 300 W. #11  
Murray, UT 84107  
(801) 266-1578

Choice Woods  
833 W. Main St.  
Louisville, KY 40202  
(888) 895-7779

Craft Supplies USA  
1287 E. 1120 S.  
Provo, UT 84606  
(800) 551-8876

Hot Stuff CA Glue  
Satellite City, P.O. Box 836  
Simi Valley, CA 93062  
(800) 786-0062

P. C. Petrifier  
Protective Coatings  
221 S. 3rd St.  
Allentown, PA 18102  
(800) 220-2103

General Finishes  
Sealacell Step 1

P.O. Box 51567  
New Berlin, WI 53151  
(800) 888-8286

For further reading:  
"Sculpting Wood" by Mark  
Lindquist, 1986, Worcester, Mass.;  
Davis Publications; \$32.50; (800)  
533-2847. Mark and his father Mel  
have been pioneers in working  
spalted wood and in popularizing  
its use as a decorative material.

"Understanding Wood" by Bruce  
Hoadley, 1980, Newtown, Conn.;  
Taunton Press; \$34.95; (800) 888-  
8286



# Build A Modern *Hoosier* CABINET

## Recreate an American icon.

Eighty years ago, before built-in cabinets were common, every modern homemaker wanted a "Hoosier" cabinet in her kitchen. As a baking center, it was the last word in efficient design and convenience, packed with labor- and time-saving features. Millions of Hoosiers, almost all manufactured by companies in Indiana, were sold before styles changed and built-in kitchen cabinets became the rage in the 1940s.

Why not put a Hoosier in your kitchen? Use it as a bread making center, a coffee bar, or to store dishes and linens or pots and pans. It's still perfectly suited to today's modern kitchens.

This Hoosier is loaded with useful features. The center section slides in and out to maximize the usefulness of the porcelain enamel work surface. Two drawers are mounted under the work surface and slide with it, so their contents are always within reach. A tambour door provides access to the cabinet without the nuisance of swinging doors.

Although it's a big project with many pieces, this Hoosier cabinet is not hard to build. It's made from dimensional  $\frac{3}{4}$ -in.-thick wood. The cabinet joinery is simple, using dados, dowels and rabbets. The doors and cabinet sides are made with routed stiles and rails. The drawers are done on the tablesaw, and both the drawers and doors overlay the openings, so fitting them is a breeze. All the hardware surface mounts and you can buy the tambour ready to install!



You'll need a dado set for your tablesaw, a router, router table, and bits (stile and rail, round-over, and flush trim), a doweling jig and a drill. A jointer and planer are handy, but optional.

For materials, you need 40 board feet of oak, one and one-half sheets of  $\frac{3}{4}$ -in. A-1 grade oak plywood, two sheets of  $\frac{1}{4}$ -in. A-1 grade oak fibercore plywood, and 15 board feet of  $\frac{1}{4}$  birch for drawer sides and runners—not bad for such a large piece. All the hardware, from the porcelain enamel



by  
**Tim Johnson**

top to the "ant traps" is available from companies that specialize in the restoration of antique Hoosiers ([see Sources, p. 63](#)). Your cost will be about \$475 for lumber and \$300 for the tambour system and cabinet hardware. If you want to dress up the interior, as we did, with internal bins and canisters, you'll spend another \$200.



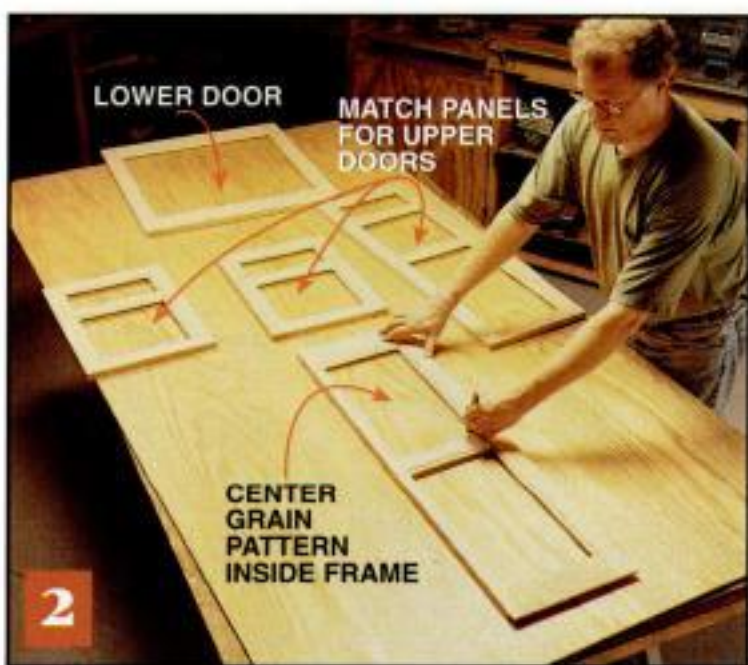
circa  
1999







**1** **MAKE COPE CUTS** in the end-grain of all of the rails first. A shop-made sled holds them safely in position while cutting. Glue a block of wood with one squarely cut end on top of a longer piece of 1/4-in. plywood. Screw on a toggle clamp. The sled assures a square cut and the block acts as a backer, preventing blow-out.



**2** **BE SELECTIVE** when choosing panels for the doors and cabinet sides. Slide the frames around on the plywood until you find attractive panels. Don't worry about wasting a little plywood. Locate panels for the upper doors first. Then find panels for the lower door and cabinet sides.



**3** **FRONT STILE**



**FIG. A FRAME AND PANEL CONSTRUCTION**

A REVERSIBLE STILE AND RAIL CUTTER cuts both ways. As a stile cutter it makes a "profile" cut on long grain. As a rail cutter it makes a matching "coped" cut on the end grain. After routing, the two parts fit neatly together in a decorative version of a tongue and groove joint. Coped cuts are made with the workpiece face up, profile cuts are made with it face down. Changing from cope to profile cutting means disassembling the cutter, rearranging the guide bearing, profile and slot cutting wings, and reassembling.

### Straight Grain Looks Best

Give a sense of order to the cabinet's structure by using straight-grained material for all face, door and side frame pieces. Cut straight-grained stock from the edges of plain-sawn boards or buy rift-sawn oak (about \$50 extra). Either way, it's worth the effort.

### Make the Doors and Cabinet Sides First

It may seem odd to make doors before the cabinets are done, but it's a good idea. The doors are the first thing you see, so they should get the best-looking panels (Photo

2). Besides, they're lipped doors that overlay their openings, so an exact fit isn't critical.

Cut all of the door and side frame stiles and rails (A1 - A6 and B1 - B9) at the same time. Use flat stock. Bowed or twisted pieces will make your life miserable.

Make these pieces into frames for the doors and sides using stile and rail cutters (see Sources, p. 63) mounted in your router table. A reversible cutter set (Fig. A) won't break your budget (\$40 to \$85) and making the change from one cut to the other only takes a few minutes. Make coped cuts

**TRIM THE CABINET SIDES** to width and the front stiles to size at the same time. Routing the narrow front stiles is dangerous. Instead, it's good practice (and faster) to make them the same width as the back stiles and cut away the excess width after the side is glued up.







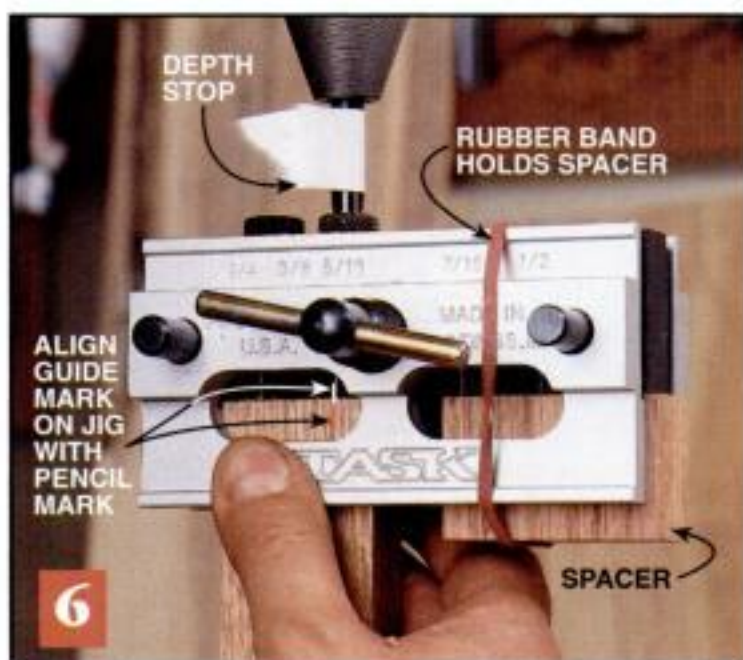
# Hoosier CABINET



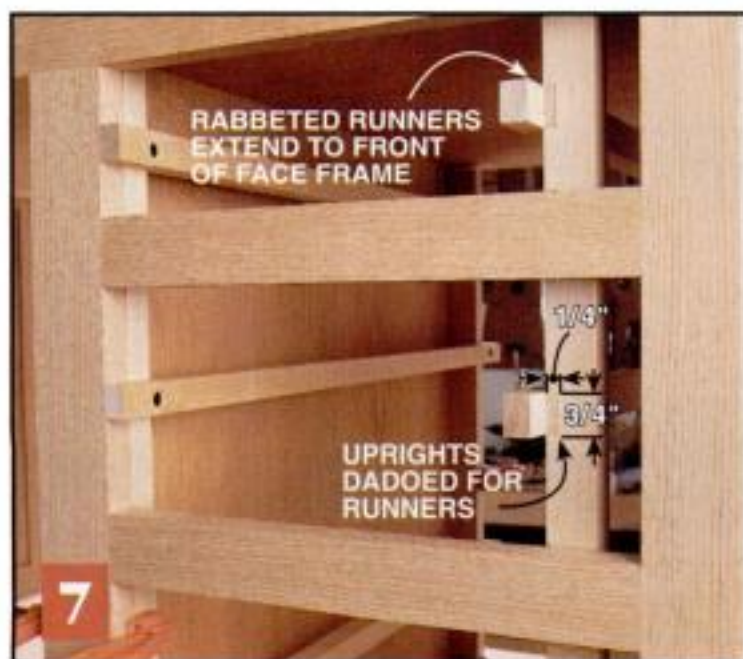
**CLAMP THE FACE FRAME** pieces together after positioning them carefully. Then, mark them for doweling. Make sure the drawer rails are properly spaced.



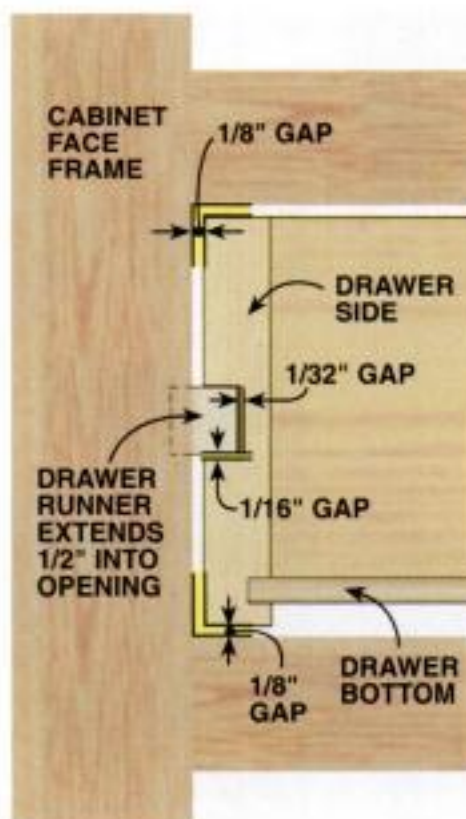
**MARK EACH JOINT** for doweling. One line drawn straight across the joint marks both pieces for the doweling jig. Label both pieces of each joint so they don't get mixed up.



**DRILL HOLES FOR DOWELS.** This doweling jig allows you to drill two holes, even on narrow pieces, from a single pencil mark. Clamp the piece in a vise. When narrow pieces have to be mounted off to one side for drilling, a spacer block evens clamp pressure. I like to hold the jig while drilling to keep it steady.



**BIRCH RUNNERS** in simple frames support the side-hung drawers. The dadoed uprights center the runners in the drawer openings. Screw these frames to the back of the face frame and to the inside walls at the back of the cabinet.



**FIG. C SIDE-HUNG DRAWERS**

**DADOES IN THE DRAWER** sides fit around frame-mounted rails, allowing drawers to slide in and out. The assembled lower cabinet drawers leave a  $\frac{1}{8}$ -in. gap around the opening, which is covered by the overlaying front. The dadoes in the sides center the drawer top to bottom and allow  $\frac{1}{16}$ -in. of side-to-side movement.

(Photo 1), then rearrange the cutters for the profile cuts.

Assemble the routed frames and find panels (C1 - C5). Finally, glue the parts together into doors (Z1, Z2 and Z5) and cabinet sides (D1 and L1).

## Build the Two Cabinets

The upper and lower cabinets share joinery methods and have similar components. Make one and you'll have no trouble with the other.

Build the lower cabinet first (Fig. B). After making the sides (D1) and cutting them to width (Photo 3), square one end with a router and straightedge, then cut the other to finish length on the tablesaw. Make the top and bottom rails an extra  $\frac{1}{8}$ -in. wide and the stiles an extra  $\frac{1}{4}$ -in. long so you'll have plenty of extra height to square the sides. After the sides are cut to size, cut rabbets in the back stiles for the plywood back. Cut the plywood shelves (D2) and divider (D3). Then cut dados for them, after using scrap stock to set the depth and width. Fit the plywood back (D4) and then assemble the lower cabinet (Photo 4).

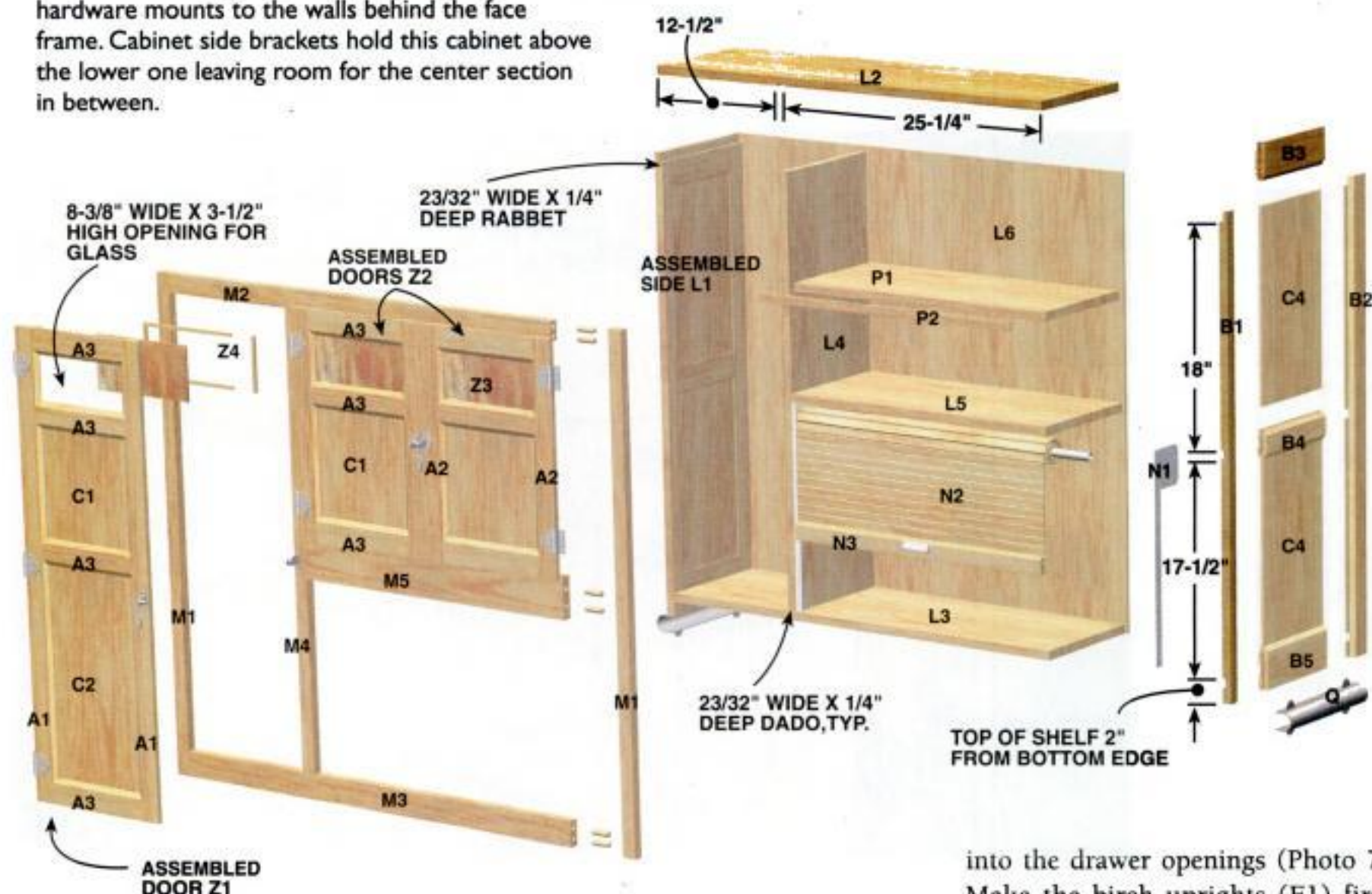
The upper cabinet (Fig. D) is similar to the lower cabinet, but has a middle half-width shelf (L5), which requires extra dados. It also has a rabbet for the top shelf (L2) instead of a dado. It's easier to glue this cabinet together in two stages. Keep the top shelf in place but unglued while gluing up everything else and glue it separately later.

Face frames (E1 - E5 and M1 - M5) give the cabinets strength and



## FIG. D EXPLODED VIEW OF UPPER CABINET

THE UPPER CABINET is dadoed, like the bottom cabinet, except for the flush-fitting top, which is rabbeted. The tambour track hardware mounts to the walls behind the face frame. Cabinet side brackets hold this cabinet above the lower one leaving room for the center section in between.



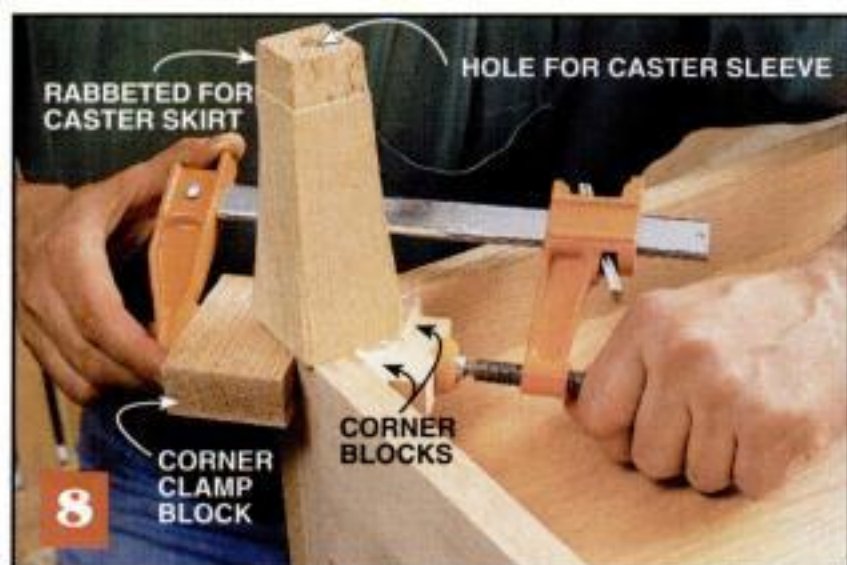
a clean appearance (Fig. G). Doweling jigs (see Sources, p. 63) make assembly fast and accurate (Photos 5 and 6). You'll need cauls and at least a dozen clamps with 30-in. capacity to glue the face frames on the bottom cabinet and even more for the top. Or you can use a nail gun and glue and nail the face

frames to the cabinet. After gluing, ease the side, top and tambour opening edges with a 1/4-in. round-over bit.

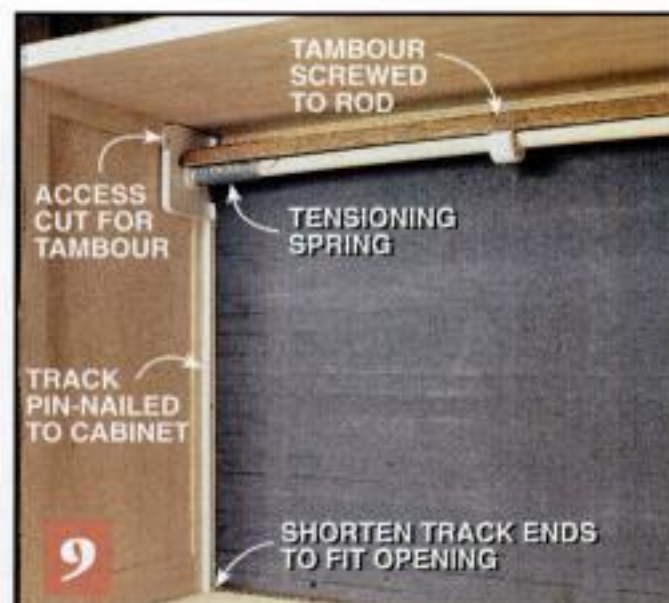
### Finish the Lower Cabinet

Install drawer runner assemblies in the lower cabinet. They fit behind the face frame so only the runners protrude

into the drawer openings (Photo 7). Make the birch uprights (F1) first. They fit against the divider on the left and the cabinet side on the right. To locate the positions of the runners (F2), set one of the uprights in place behind the face frame and mark it for dados centered in each drawer opening. Use this piece to set up and cut the dados in all four pieces. Mill the run-



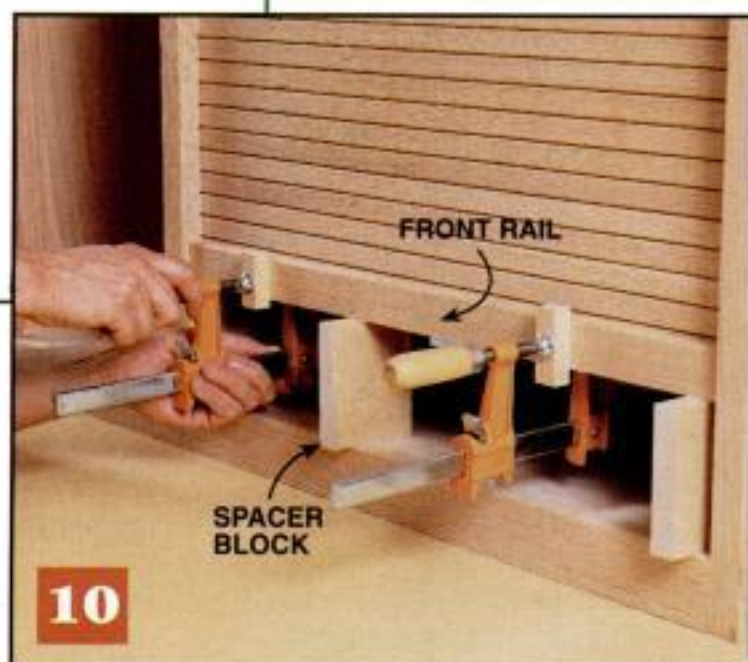
**GLUE THE LEG** to the lower cabinet. Then glue corner blocks to the leg tenon and cabinet frame. These mail-order legs (see Sources, p. 63) are authentic Hoosier replicas, ready for skirts and casters.



**THE TAMBOUR SYSTEM** is a snap to install. The system works like a window shade, using spring tension to help lift and roll the tambour, which travels up and down in grooves in the plastic tracks.



# Hoosier CABINET



**CLAMP THE FRONT** rail to the tambour and attach it from the backside with screws. The tambour and rail rest on spacer blocks that allow room for the clamps.



**ASSEMBLE THE WEB FRAME** inside the porcelain enamel work surface. It fits inside the lip. Fit the stiles first. They have access cuts in them so the rails drop in place and slide into position.

ners from straight-grained birch stock so they're flat and square. Cut rabbets in their front edges so they'll extend beyond the uprights to the front of the face frame. Then screw them in place.

The legs (G1) have long tenons for gluing behind the cabinet frame (Fig. B, detail 2). With the cabinet upside down, fit the tenons to the front inside corners of the cabinet, making sure the leg shoulders butt solidly against its bottom edges. Then glue them in place. Glue a rail (G2) to the back edge of the bottom shelf for the back legs, rabbeted so it fits between the leg tenon and cabinet back. After gluing, add corner blocks (Photo 8). Then drill

holes in the legs and insert the caster sleeves.

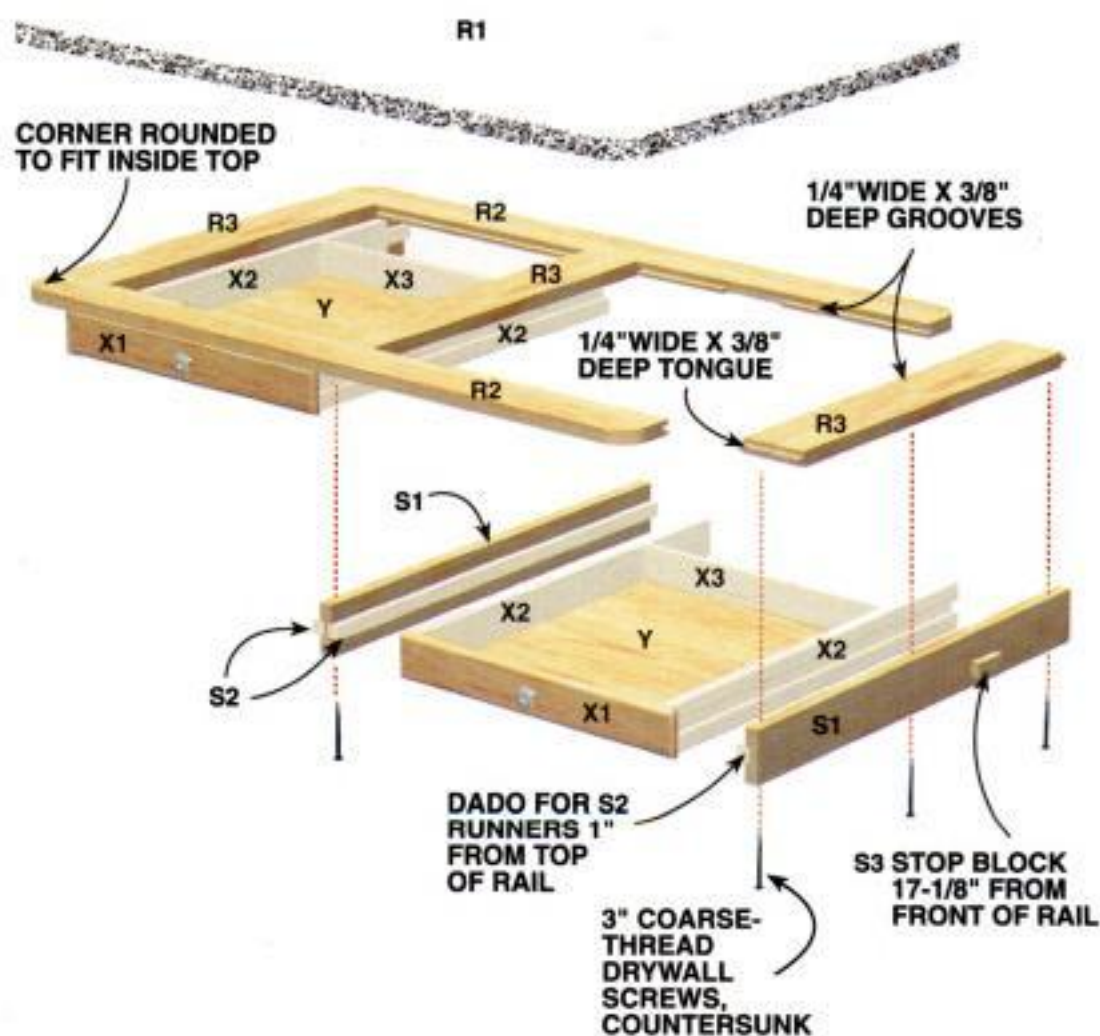
Turn the cabinet upright. Add guides (H1), stops (H2) and ultra-high molecular weight (UHMW) plastic strips (J) ([see Sources, p. 63](#)) for the sliding center section in the cavity at the top of the cabinet (Fig. B, detail 1). Make sure the guides are perpendicular to the cabinet front and flush with the inside edge of the face frame stiles.

## Install the Tambour in the Upper Cabinet

[Adapting a dedicated tambour and track system made for a kitchen "appliance garage" \(see Sources, p. 63\) saves the trouble of making a tambour and rout-](#)

## FIG. E THE CENTER SECTION

THE PORCELAIN ENAMEL WORK SURFACE is stiffened by an internal web frame. Screwed-on rails hold cutlery drawers on dadoed, side-hung runners. To install or remove the center section, simply lift its front slightly so the stop blocks miss one another.

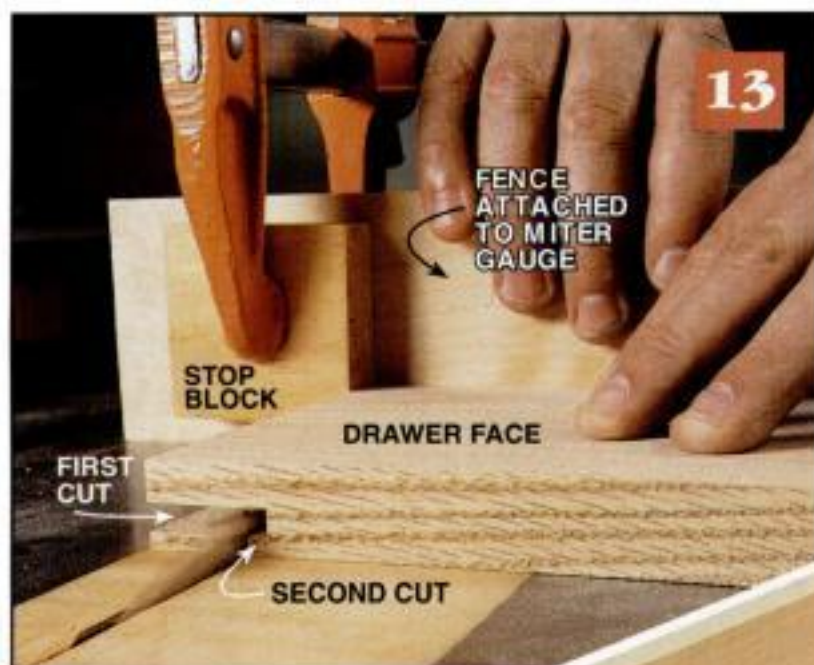


ing tracks for it in the cabinet. Instead, simply cut the plastic tracks (N1) to fit the opening and make an access slot in them for the tambour (N2) (Photo 9). Cut the tambour to width and then install the system following the manufacturer's instructions. Make and attach the front rail (N3). Drill holes through the bottom slats of the tambour for fastening (Photo 10).

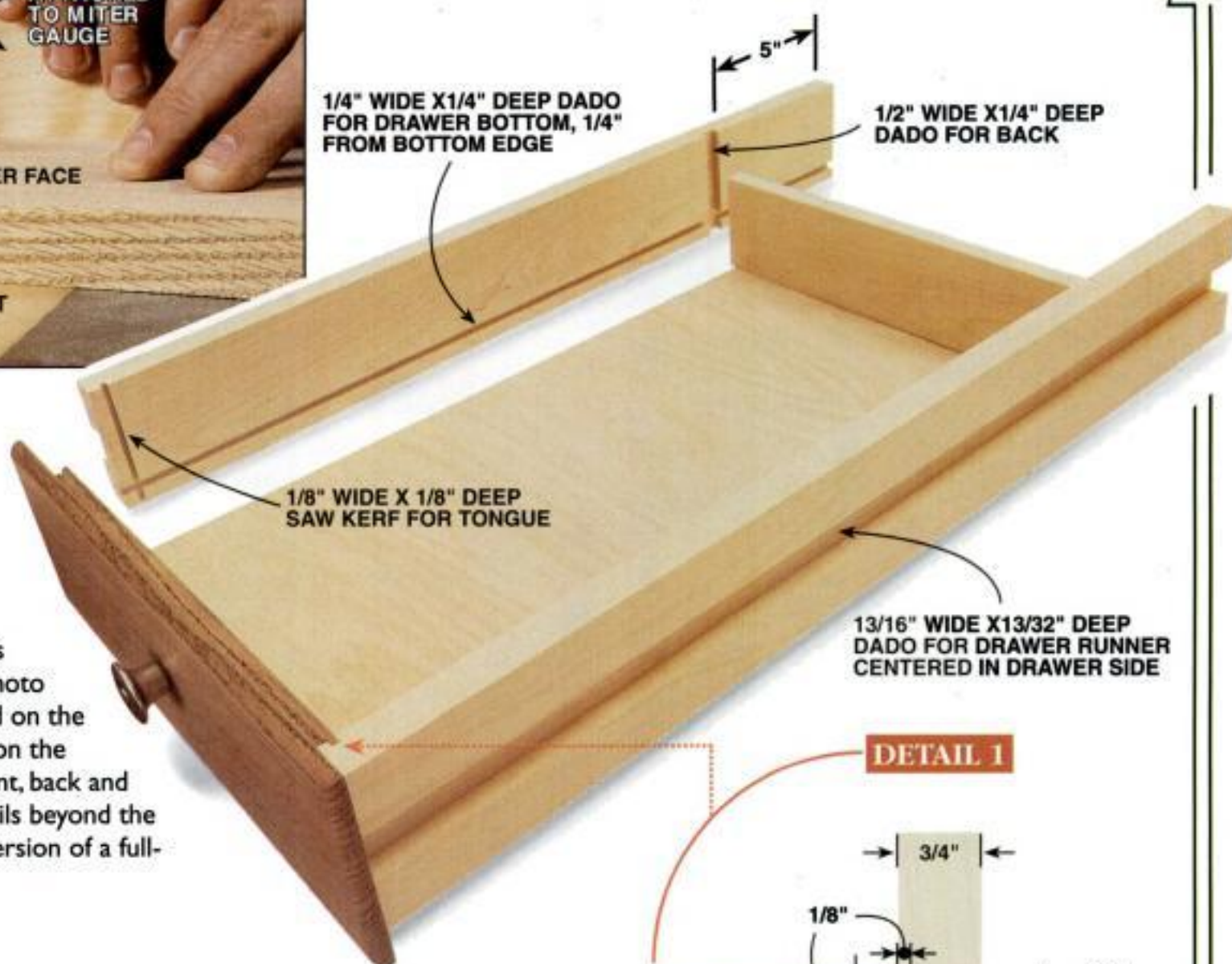
## Assemble the Center Section

Cabinet side brackets (Q) ([see Sources, p. 63](#)) hold the upper cabinet above the lower so the center section (Fig. E) has room to fit between them. The center section slides inside the cavity at the top of the lower cabinet, limited by stop





**TRIM THE TONGUE** on the drawer front. First cut a vertical slot, leaving  $\frac{3}{8}$ -in. at the front (the same thickness as the door lips) and  $\frac{1}{8}$ -in. at the back. Then cut the tongue to length.



## FIG. F DRAWER CONSTRUCTION

THE DRAWER JOINT is a simple tongued rabbet. The drawer fronts require only two cuts (Photo 13). The sides are dadoed on the outside for runners and on the inside for the drawer front, back and bottom. Extending the rails beyond the drawer back is the 20s version of a full-extension drawer.

blocks (H2 and S3) and the cabinet back. The porcelain enamel work surface (R1) fits neatly inside the concave curve of the side bracket. It contains a web frame for rigidity (Photo 11).

Three rails (S1) support the center section and allow it to slide. The outer rails, spaced  $\frac{1}{2}$ -in. narrower than the opening between the lower cabinet stiles, limit side-to-side travel. Dadoed runners (S2) in these rails hold narrow drawers (Fig. E).

Cut dados in the rails and glue the runners in them before drilling holes for the mounting screws. Position the rails  $1\frac{1}{4}$ -in. back from the front edge of the porcelain enamel work surface to allow a sufficient overhang once the drawers are in place.

## Make the Drawers

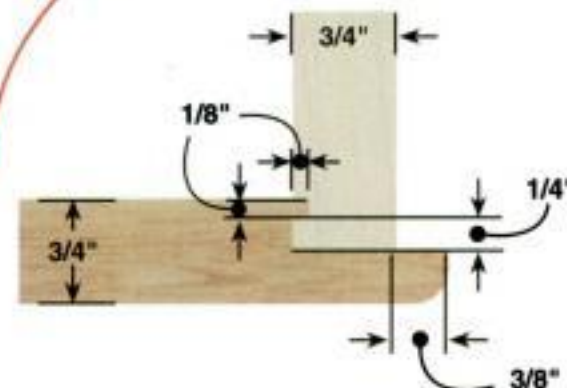
All the drawers (parts T, U, V and X) are side hung (Fig. C). Their joints are made using simple tablesaw cuts (Fig. F and Photo 13).

The cabinet drawer fronts are lipped  $\frac{3}{8}$  in. on all four sides so they overlay the openings. The cutlery drawer fronts have lipped edges, but are flush top and bottom to maximize their depth. Drill centered holes for the knobs before gluing the drawers together.

## Finish and Mount the Doors

Rabbet the backsides of the openings at [the top of the doors for the glass](#) (see [Sources, p. 63](#)). Then create the  $\frac{3}{8}$ -in. lip on the door fronts by cutting a  $\frac{3}{8}$ -in. square rabbet around their back edges (Photo 14). Test fit the offset hinges to make sure the lip is the right thickness.

## DETAIL 1



Put a door in its opening and lay a hinge on it. If the lip is too thick, the hinge won't lay flat on the cabinet and the door will bind. First mount the hinges on the doors (Photo 15), then mount the doors on the cabinet (Photo 16).

## Apply a Finish

This Hoosier is finished with a medium-brown colored, oil-based gel stain topped with three coats of amber-toned waterborne poly. Before using them, I made double sure these two different finish products were compatible. First, both were made by the same manufacturer. Second, I read the labels, which verified compatibility by name.



# Hoosier CABINET



**ROUND THE DOOR EDGES** with a  $\frac{1}{4}$ -in. bit after cutting rabbets around the backs. The two adjacent edges of the small upper cabinet doors (Z2) are not rabbeted.



**USE A SPACER** to locate the door hinges and drill centered holes for the screws. The hardware comes with plated brass screws, which break easily. Either use a steel screw to cut threads in the holes first and lubricate the brass screws before using them, or replace them altogether with stainless steel screws.



Gel stains are easy to apply and color surfaces evenly. I used two coats because I wanted a deep color. Toning the poly (see "Just Finishing" p. 106) warms the color of the stained wood. Each coat enhances the effect. It's an easy way to get a nice looking, durable finish.

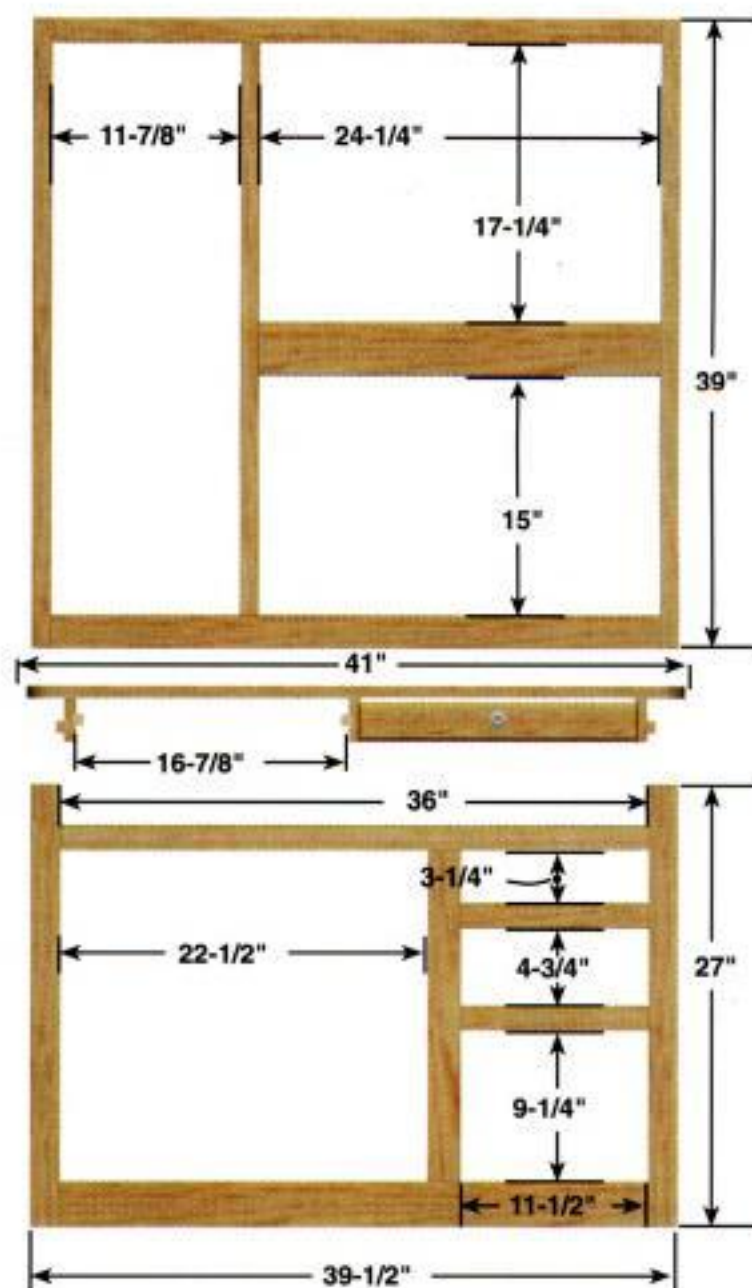
Before finishing, remove all of the hardware, sand everything and

remove the sanding dust. Dampen the surfaces and sand again, lightly, because the waterborne finish will raise the grain, even through the oil stain.

After letting the finish dry thoroughly, mount the glass (Z3) in the doors, reassemble your Hoosier, and (have your spouse) start baking! **AW**

## FIG. G FACE FRAMES

IT'S IMPORTANT that face frames are square and their parts positioned exactly. It's also good practice to make the frames slightly oversized. It's easier to glue them to the cabinet when there's room to adjust the fit. Make the outer stiles and upper rails an extra  $\frac{1}{16}$ -in. wide. After gluing, trim the excess with a flush trim bit in your router.



**MOUNT THE DOORS** on the cabinet, centered in the openings. Their  $\frac{3}{8}$ -in.-wide lips allow room for minor adjustments. A straightedge clamped evenly across the top of the cabinet aligns the door tops.



## DIMENSIONS

**OVERALL DIMENSIONS 74" H X 42" W X 27" D**

| Ref.                                                             | Qty. | Dimensions                | Parts                      |
|------------------------------------------------------------------|------|---------------------------|----------------------------|
| <b>Doors</b>                                                     |      |                           |                            |
| A1                                                               | 2    | 3/4" x 2" x 36"           | (upper left door stiles)   |
| A2                                                               | 4    | 3/4" x 2" x 17-3/4"       | (upper right door stiles)  |
| A3                                                               | 10   | 3/4" x 2" x 9-1/8"        | (upper rails)              |
| A4                                                               | 2    | 3/4" x 2-3/8" x 20-3/4"   | (lower stiles)             |
| A5                                                               | 1    | 3/4" x 2-3/8" x 19"       | (lower top rail)           |
| A6                                                               | 1    | 3/4" x 3" x 19"           | (lower bottom rail)        |
| <b>Cabinet Sides</b>                                             |      |                           |                            |
| B1                                                               | 2    | 3/4" x 1-1/4" x 39"       | (upper front stiles)       |
| B2                                                               | 2    | 3/4" x 2" x 39"           | (upper back stiles)        |
| B3                                                               | 2    | 3/4" x 3" x 8-1/2"        | (upper top rails)          |
| B4                                                               | 2    | 3/4" x 2-1/4" x 8-1/2"    | (upper middle rails)       |
| B5                                                               | 2    | 3/4" x 3-1/2" x 8-1/2"    | (upper bottom rails)       |
| B6                                                               | 2    | 3/4" x 1-3/8" x 27"       | (lower front stiles)       |
| B7                                                               | 2    | 3/4" x 2-1/8" x 27"       | (lower back stiles)        |
| B8                                                               | 2    | 3/4" x 3-3/4" x 21"       | (lower top rails)          |
| B9                                                               | 2    | 3/4" x 4-1/2" x 21"       | (lower bottom rails)       |
| * final size, see Photo 2                                        |      |                           |                            |
| <b>Panels</b>                                                    |      |                           |                            |
| C1                                                               | 3    | 1/4" x 9-1/8" x 9"        | plywood (upper doors)      |
| C2                                                               | 1    | 1/4" x 9-1/8" x 17"       | plywood (left upper door)  |
| C3                                                               | 1    | 1/4" x 19" x 16-1/8"      | plywood (lower door)       |
| C4                                                               | 4    | 1/4" x 8-1/2" x 15-7/8"   | plywood (upper sides)      |
| C5                                                               | 2    | 1/4" x 21" x 19-1/2"      | plywood (lower sides)      |
| <b>Lower Cabinet: 39-1/2" W x 24-1/2" D x 27" H (w/out legs)</b> |      |                           |                            |
| D1                                                               | 2    | 3/4" x 23-3/4" x 27"      | (assembled sides)          |
| D2                                                               | 2    | 3/4" x 23-1/2" x 38-1/2"  | plywood (shelves)          |
| D3                                                               | 1    | 3/4" x 23-1/2" x 21-1/2"  | plywood (divider)          |
| D4                                                               | 1    | 1/4" x 38-3/4" x 27"      | plywood (back)             |
| E1                                                               | 2    | 3/4" x 1-3/4" x 27"       | (face frame stiles)        |
| E2                                                               | 1    | 3/4" x 1-1/2" x 36"       | (upper face frame rail)    |
| E3                                                               | 1    | 3/4" x 2-3/4" x 36"       | (lower face frame rail)    |
| E4                                                               | 1    | 3/4" x 2" x 20-1/4"       | (face frame center stile)  |
| E5                                                               | 2    | 3/4" x 1-1/2" x 11-1/2"   | (face frame drawer rails)  |
| F1                                                               | 4    | 3/4" x 1" x 20-3/4"       | (drawer runner uprights)   |
| F2                                                               | 6    | 3/4" x 3/4" x 24"         | (drawer runners)           |
| G1                                                               | 4    | 2" x 2" x 7"              | (legs)                     |
| G2                                                               | 1    | 3/4" x 2" x 38"           | (leg rail)                 |
| H1                                                               | 2    | 5/8" x 3/4" x 23"         | (middle section guides)    |
| H2                                                               | 2    | 1/2" x 3/4" x 6"          | (middle section stops)     |
| J                                                                | 3    | 1/32" x 3/4" x 24"        | (UHMW plastic runners)     |
| K1                                                               | 1    | 3/4" x 22-3/4" x 23-5/8"  | plywood (adjustable shelf) |
| K2                                                               | 1    | 1/4" x 3/4" x 23-5/8"     | (edging)                   |
| <b>Upper Cabinet: 39-1/2" W x 11-3/4" D x 39" H</b>              |      |                           |                            |
| L1                                                               | 2    | 3/4" x 11" x 39"          | (assembled sides)          |
| L2                                                               | 1    | 3/4" x 11" x 38-1/2"      | plywood (top)              |
| L3                                                               | 1    | 3/4" x 10-3/4" x 38-1/2"  | plywood (bottom shelf)     |
| L4                                                               | 1    | 3/4" x 10-3/4" x 36-3/4"  | plywood (divider)          |
| L5                                                               | 1    | 3/4" x 10-3/4" x 25-5/8"  | plywood (middle shelf)     |
| L6                                                               | 1    | 1/4" x 38-3/4" x 38-5/8"  | plywood (back)             |
| M1                                                               | 2    | 3/4" x 1-1/8" x 39"       | (face frame stiles)        |
| M2                                                               | 1    | 3/4" x 1-1/2" x 37-1/4"   | (upper face frame rail)    |
| M3                                                               | 1    | 3/4" x 2" x 37-1/4"       | (lower face frame rail)    |
| M4                                                               | 1    | 3/4" x 1-1/8" x 35-1/2"   | (face frame center stile)  |
| M5                                                               | 1    | 3/4" x 3-1/4" x 24-1/4"   | (face frame center rail)   |
| N1                                                               | 2    | 5/16" x 3-3/8" x 17-12"   | (tambour track)            |
| N2                                                               | 1    | 1/4" x 24-7/8" x 18"      | tambour (roll up door)     |
| N3                                                               | 1    | 1/2" x 1-7/16" x 24-1/4"  | (tambour rail)             |
| P1                                                               | 1    | 3/4" x 10-1/4" x 24-7/8"  | plywood (adjustable shelf) |
| P2                                                               | 1    | 1/4" x 3/4" x 24-7/8"     | (edging)                   |
| Q                                                                | 2    | 1-3/8" x 1-3/4" x 10-7/8" | (metal brackets)           |

| Ref.                                             | Qty. | Dimensions                | Parts                      |
|--------------------------------------------------|------|---------------------------|----------------------------|
| <b>Middle Section: 41" W x 27" D x 3'9/16" H</b> |      |                           |                            |
| R1                                               | 1    | 41" x 27" x 1"            | (porcelain enamel top)     |
| R2                                               | 2    | 3/4" x 3 x 40-3/4"        | (web frame stiles)         |
| R3                                               | 3    | 3/4" x 3-1/2 x 21-3/8"    | (web frame rails)          |
| S1                                               | 3    | 3/4" x 2-3/4 x 25-3/8"    | (rails)                    |
| S2                                               | 4    | 3/4" x 3/4" x 25-3/8"     | (drawer runners)           |
| S3                                               | 2    | 1/2" x 3/4" x 2"          | oak (middle section stops) |
| <b>Drawers</b>                                   |      |                           |                            |
| T1                                               | 1    | 3/4" x 9-3/4" x 12"       | (top face)                 |
| T2                                               | 2    | 3/4" x 9" x 23"           | (sides)                    |
| T3                                               | 1    | 1/2" x 8-1/2" x 10-1/4"   | (back)                     |
| U1                                               | 1    | 3/4" x 5-1/4" x 12"       | (middle face)              |
| U2                                               | 2    | 3/4" x 4-1/2" x 23"       | (sides)                    |
| U3                                               | 1    | 1/2" x 4" x 10-1/4"       | (back)                     |
| V1                                               | 1    | 3/4" x 3-3/4" x 12"       | (bottom face)              |
| V2                                               | 2    | 3/4" x 3" x 23"           | (sides)                    |
| V3                                               | 1    | 1/2" x 2-1/2" x 10-1/4"   | (back)                     |
| W                                                | 3    | 1/4" x 18-7/8" x 10-1/4"  | plywood (drawer bottoms)   |
| X1                                               | 2    | 3/4" x 2-3/8" x 17-5/16"  | (cutlery faces)            |
| X2                                               | 4    | 3/4" x 2-3/8" x 23"       | (sides)                    |
| X3                                               | 2    | 1/2" x 1-7/8" x 15-9/16"  | (backs)                    |
| Y                                                | 2    | 1/4" x 15-9/16" x 17-7/8" | plywood (drawer bottoms)   |
| <b>Doors</b>                                     |      |                           |                            |
| Z1                                               | 1    | 3/4" x 12-3/8" x 36"      | (upper left)               |
| Z2                                               | 2    | 3/4" x 12-3/8" x 17-3/4"  | (upper right)              |
| Z3                                               | 3    | 1/8" x 4-1/8" x 9"        | (amber slag glass)         |
| Z4                                               | 12   | 1/4" x 1/4"               | trim to fit (glass stops)  |
| Z5                                               | 1    | 3/4" x 23" x 20-3/4"      | (lower)                    |
| Q2                                               | 1    | 1/4" x 3/4" x 24-7/8"     | (edging)                   |
| <b>Middle Section: 41" W x 27" D x 3'9/16" H</b> |      |                           |                            |
| R1                                               | 1    | 41" x 27" x 1"            | (porcelain enamel top)     |
| R2                                               | 2    | 3/4" x 3 x 40-3/4"        | (web frame stiles)         |
| R3                                               | 3    | 3/4" x 3-1/2 x 21-3/8"    | (web frame rails)          |
| S1                                               | 3    | 3/4" x 2-3/4 x 25-3/8"    | (rails)                    |
| S2                                               | 4    | 3/4" x 3/4" x 25-3/8"     | (drawer runners)           |
| S3                                               | 2    | 1/2" x 3/4" x 2"          | (middle section stops)     |
| <b>Drawers</b>                                   |      |                           |                            |
| T1                                               | 1    | 3/4" x 3-3/4" x 12"       | (top face)                 |
| T2                                               | 2    | 3/4" x 3" x 23-1/2"       | (sides)                    |
| T3                                               | 1    | 1/2" x 2-1/2" x 10-1/4"   | (back)                     |
| U1                                               | 1    | 3/4" x 5-1/4" x 12"       | (middle face)              |
| U2                                               | 2    | 3/4" x 4-1/2" x 23-1/2"   | (sides)                    |
| U3                                               | 1    | 1/2" x 4" x 10-1/4"       | (back)                     |
| V1                                               | 1    | 3/4" x 9-3/4" x 12"       | (bottom face)              |
| V2                                               | 2    | 3/4" x 9" x 23-1/2"       | (sides)                    |
| V3                                               | 1    | 1/2" x 8-1/2" x 10-1/4"   | (back)                     |
| W                                                | 3    | 1/4" x 18-7/8" x 10-1/4"  | plywood (drawer bottoms)   |
| X1                                               | 2    | 3/4" x 2-3/8" x 17-3/8"   | (cutlery faces)            |
| X2                                               | 4    | 3/4" x 2-3/8" x 23-1/2"   | (sides)                    |
| X3                                               | 2    | 1/2" x 1-7/8" x 15-5/8"   | (backs)                    |
| Y                                                | 2    | 1/4" x 15-5/8" x 18-7/8"  | plywood (drawer bottoms)   |
| <b>Assembled Doors</b>                           |      |                           |                            |
| Z1                                               | 1    | 3/4" x 12-3/8" x 36"      | (upper left)               |
| Z2                                               | 2    | 3/4" x 12-3/8" x 17-3/4"  | (upper right)              |
| Z3                                               | 3    | 1/8" x 4-1/8" x 9"        | (amber slag glass)         |
| Z4                                               | 12   | 1/4" x 1/4" x 10"         | trim to fit (glass stops)  |
| Z5                                               | 1    | 3/4" x 23" x 20-3/4"      | (lower)                    |

## SOURCES

Hardware Kits for this project are available from Phyllis Kennedy Hardware, Inc., 10655 Andrade Drive, Zionsville, IN 46077; (317) 873-1316. Basic Kit contains porcelain enamel top, legs, slag glass, metal side brackets and cabinet hardware necessary to complete the cupboard; \$235. (Does not include tambour and track system.) Add-on Kit contains flour bin (which is not food safe), sugar jar, spice jars and carousel and a door chart set; \$200.

Hoosier Hardware and Accessories: Complete line available from Van Dyke's Restorers Catalog; (800) 787-3355; [www.vandykes.com](http://www.vandykes.com)

Frameless Track System with Tambour Door: Part # NPSW30 30 OW and NPST3; \$62. Woodworker's Hardware PO Box 180 Sauk Rapids, MN 56379 (800) 383-0130

Reversible Stile and Rail Cutters are widely available at home centers, woodworking specialty stores and through the mail. One mail-order source is MLCS (800) 533-9298; [www.mclswoodworking.com](http://www.mclswoodworking.com); Item #8853; "Traditional" profile cutter set, 1/2-in. shank; \$65; item #6553; "Traditional" profile cutter set, 1/4-in. shank; \$65.

Doweling Jig, part #124315; \$50  
Hinge Bit, part #12808; \$9  
UHMW Adhesive-Backed Plastic, part #16L64; \$6  
Woodcraft Supply; (800) 225-1153; [www.woodcraft.com](http://www.woodcraft.com)



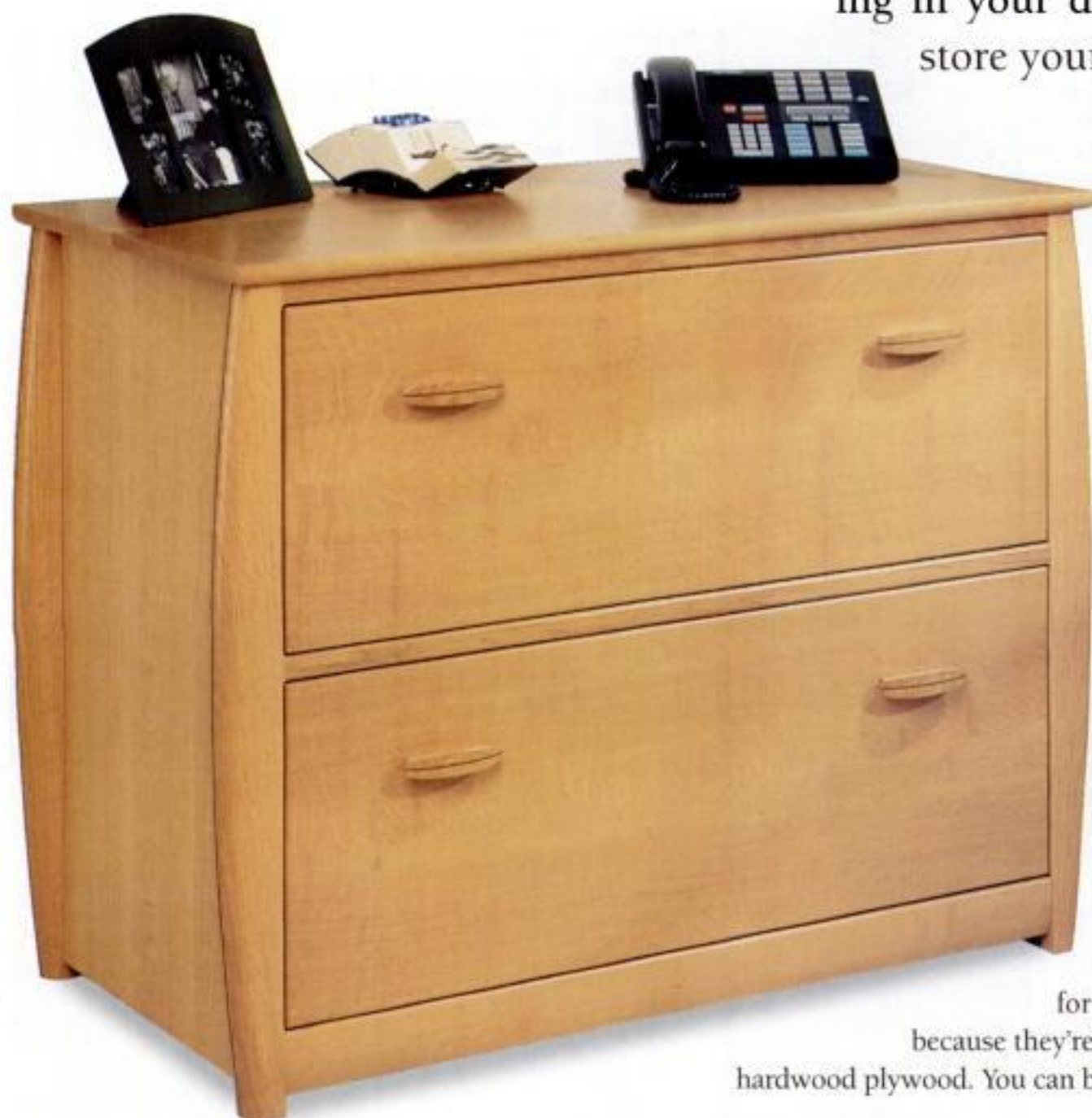
Arrange your files  
any way you want!



# 4-WAY FILE

By Andy Rae

Imagine the ultimate home office: books and reference materials neatly arranged on a shelf, pens and pencils ready to go, keyboard and phone within easy reach and a comfy swivel chair. The only item missing in your dream setup is a place to store your reams of paperwork.



This file cabinet gives you four ways to arrange your papers. You can set up each drawer for letter or legal size papers. You can arrange them side-to-side or front-to-back (photos above). This first-rate system came from Robbi Staples of North Dartmouth, Mass., who designed and built this cabinet.

It's made from quartersawn white oak, a wood Robbi prefers for its look and feel as well as stability. With a frame-and-panel back this cabinet requires about 55 bd. ft. of lumber. The cost of materials plus hardware is about \$400. The cabinet's sides are solid wood, so it's important to select well-seasoned boards that won't cup.

The drawers are made from 1/2-in. Baltic birch. An alternative is Apple-Ply plywood. Both are very strong, with nine layers of plies, and are ideal for drawer joinery. The edges look clean

because they're free of the voids common in standard hardwood plywood. You can buy Baltic birch plywood from specialty





MOVE DIVIDERS  
BACK FOR  
LEGAL-SIZE  
FOLDERS

GROOVE

**Flexible filing** distinguishes a great cabinet. You can arrange the drawer dividers for lateral filing of letter-size folders or legal files. Or file both sizes of folders front-to-back.

A cleverly bent piece of wire makes this modular system possible. It's easy to place a divider anywhere you want by merely sliding it over the "magic wire."

# CABINET

dealers or order it from larger home centers. A list of Apple-Ply distributors is available from States Industries (800-626-1981).

The cabinet consists of four major assemblies: the sides, the rails and bottom, the frame and panel back, and the two drawers (Fig. A). We'll start with the sides.

## Making The Sides and Legs

Glue up the  $\frac{3}{4}$ -in. thick panels. Mill the long tongue on the panel sides with a router and straight bit, or with a dado blade on the tablesaw.

Tackle the legs next. They're a sandwich of solid wood and veneer. Make each leg from two pieces of wood cut a bit wider than their final size and two pieces of  $\frac{1}{16}$ -in.-thick black veneer (available from Constantine's, #DV133, \$3.90/sq. ft., 800-223-8087). Glue the sandwich together, mill it to final size, and rout a stopped groove in each leg. Saw each leg's curve on the bandsaw (Photo 1).

Glue up the side assembly. Place the work on a flat surface to avoid twist, and join each pair of legs to a side panel. (Photo 2).

Make two simple jigs from medium-density fiberboard (MDF) for the mortises and dadoses that will join the sides to the rails (Fig. B). The large jig to cut dadoses for the top rails and the bottom has a  $\frac{3}{4}$ -in. wide slot (Photo 3). The smaller jig, to cut the short mortises for the mid rail, has a  $\frac{3}{8}$ -in. slot. Align the center of the slots over your layout marks. Switch from jigs to a simple edge guide to cut the mortise for the bottom rail and the rabbet that will receive the back.

## Assembling the Case

Glue up and mill the case bottom to size. It's made of solid wood instead of plywood so it can be glued to the sides and expand and contract along with them.

The case's joinery will accommodate this wood movement. While the width of the top and sides will change with the seasons, the length of the side rail will not. Therefore, most of this rail is not glued to the case side, nor is its tenon glued into the back rail. In fact, there's a space between the two (Fig. A). Drill oval holes in the side rail to allow the screws that



**1** Bandsaw the laminated leg. Cut about  $\frac{1}{16}$ -in. away from the line, then sand or scrape the leg to the finished curve.



**2** Glue the legs to the side panel. One long tongue and groove joint lines up everything. Before the glue dries, turn over the assembly and lay a straightedge across the legs and panel. Adjust the clamps if a leg is twisted.

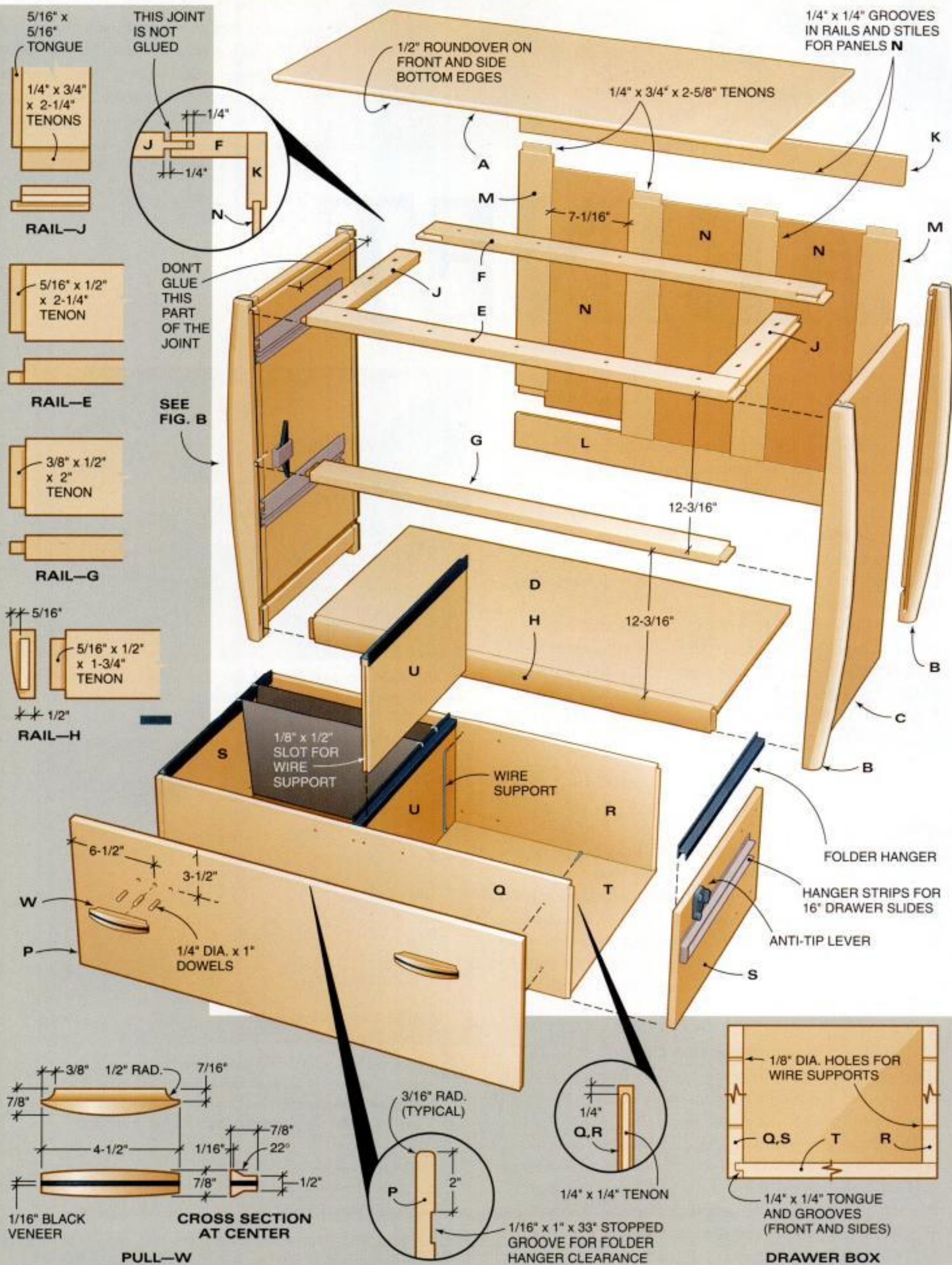
hold down the top to move back and forth.

Cut tenons on all the rails. Rabbet the side rails. Mortise the back rails to receive the side rails. Shape the curved face of the bottom rail with a plane (Fig. A and Photo 4).

Now you're ready to glue up the case. To simplify assem-



# Fig. A—FILE CABINET ASSEMBLY





# 4-WAY FILE CABINET

bly, glue only the front rails and the bottom to the side assemblies (Photo 5).

After the case is dry, slip the side rails in from the rear but don't push them all the way home. Stop 2 in. from the front rail. Spread glue into the front rail's mortise and into the side's dado. Push the side rail home and clamp it to the sides. Then glue the back rail to the case side. Don't glue it to the side rail.

## Making the Back

Make the back from solid oak panels and an oak frame. A frame and panel back stiffens the case and looks handsome, which is important if your office arrangement calls for the back to be exposed.

Substitute a 1/2-in.-thick plywood back if the cabinet will sit against a wall.

## Making Filing Drawers

The drawers are the heart of this filing cabinet. Begin by cutting all the drawer parts to size, including the solid fronts. Cut grooves for the drawer bottom into the plywood fronts and sides with a router and edge guide (Photo 6) or on the tablesaw. Next, rabbet the plywood bottoms to fit the grooves.

Rout a shallow stopped dado on the back side of each solid drawer front. This creates a pocket for the slip-on folder hanger you'll use with lateral files.

## MATERIALS LIST

File Cabinet White Oak 30 H 37 1/2 W 19 1/2 D

| REF.                                                           | PART              | QTY. | THICK  | WIDTH   | LENGTH | COMMENTS                                    |
|----------------------------------------------------------------|-------------------|------|--------|---------|--------|---------------------------------------------|
| <b>CASE</b>                                                    |                   |      |        |         |        |                                             |
| A                                                              | Top               | 1    | 3/4    | 19 1/2  | 37 1/2 |                                             |
| B                                                              | Legs              | 4    | 1 3/4* | 2 1/2** | 29 1/2 | *includes 2-1/8 in. veneer<br>**rough width |
| C                                                              | Sides             | 2    | 3/4    | 16 1/2  | 28 1/2 |                                             |
| D                                                              | Bottom            | 1    | 3/4    | 17 1/2  | 34 1/2 |                                             |
| E                                                              | Top Rail          | 1    | 1 3/4  | 2 1/2   | 34 1/2 | includes 1/2-in. long tongues               |
| F                                                              | Back Rail         | 1    | 1 3/4  | 2 1/2   | 34 1/2 | includes 1/2-in. long tongues               |
| G                                                              | Mid Rail          | 1    | 1 3/4  | 2 1/2   | 34 1/2 | includes 1/2-in. long tenons                |
| H                                                              | Bottom Rail       | 1    | 1 3/4  | 2 1/2   | 34 1/2 | includes 1/2-in. long tenons                |
| J                                                              | Side Rails        | 2    | 1 3/4  | 2 1/2   | 14 1/2 | includes 1/2-in. long tenons                |
| <b>BACK</b> Overall Dimensions: 5 1/2 Th x 34 1/2 W x 28 1/4 L |                   |      |        |         |        |                                             |
| K                                                              | Top Rail          | 1    | 3/4    | 2 1/2   | 34 1/2 |                                             |
| L                                                              | Bottom Rail       | 1    | 3/4    | 3 1/4   | 34 1/2 |                                             |
| M                                                              | Stiles            | 4    | 3/4    | 3 1/4   | 24     | includes 3/4-in. long tenons                |
| M                                                              | Panels            | 3    | 3/4    | 7 1/2   | 23     |                                             |
| <b>DRAWERS</b>                                                 |                   |      |        |         |        |                                             |
| P                                                              | Applied Fronts    | 2    | 3/4    | 12      | 33 1/4 |                                             |
| Q                                                              | Fronts            | 2    | 1/2    | 9 1/2   | 32 1/4 | includes 1/4-in. long tenons                |
| R                                                              | Backs             | 2    | 1/2    | 9       | 32 1/4 | includes 1/4-in. long tenons                |
| S                                                              | Sides             | 4    | 1/2    | 9 1/2   | 17     |                                             |
| T                                                              | Bottoms           | 2    | 1/2    | 16 1/2  | 32 1/4 |                                             |
| U                                                              | Short Dividers    | 4    | 1/2    | 9       | 16     |                                             |
| V                                                              | Long Dividers     | 2    | 1/2    | 9       | 31 1/4 |                                             |
| W                                                              | Pulls             | 4    | 3/8*   | 1/2     | 4 1/2  | *includes 1/4-in. veneer                    |
|                                                                | Black-dyed veneer | 1    | 1/4    | 3       | 25 ft. |                                             |

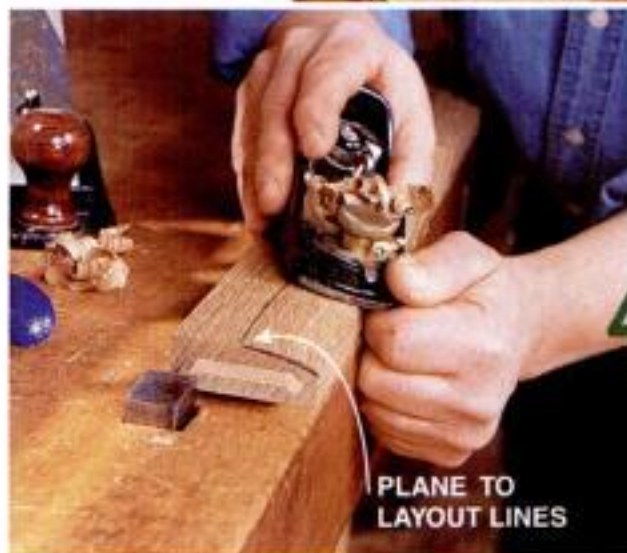
**HARDWARE** For sources see "File Cabinet Hardware," p. 70.  
Over-Travel Drawer Slides, 2 pr. of 16 in.  
Anti-Tip Hardware, 1 two-drawer set  
Wire Supports 8

3

Cut mortises and dados into the side with a plunge router. There's no chance of getting a wobbly cut with this simple jig.



ROUTER  
BASEPLATE  
FITS BETWEEN  
FENCES



PLANE TO  
LAYOUT LINES

4

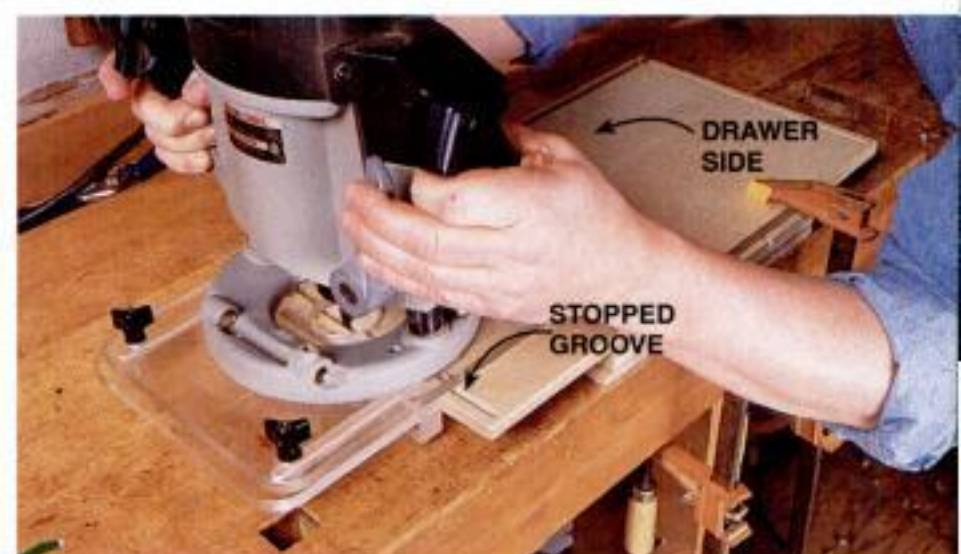
Shape the curved lower rail by hand. First draw the curve on both ends. Then extend lines that define the curve's width and depth down the length of the board. Plane to the lines and sand.



ASSEMBLE  
CASE  
ON FLAT  
SURFACE

5

Glue up the case. Join the side assemblies with the front rails and the bottom. Once the glue has dried, slip in the side rails and back rail from the rear of the case.



DRAWER  
SIDE

STOPPED  
GROOVE

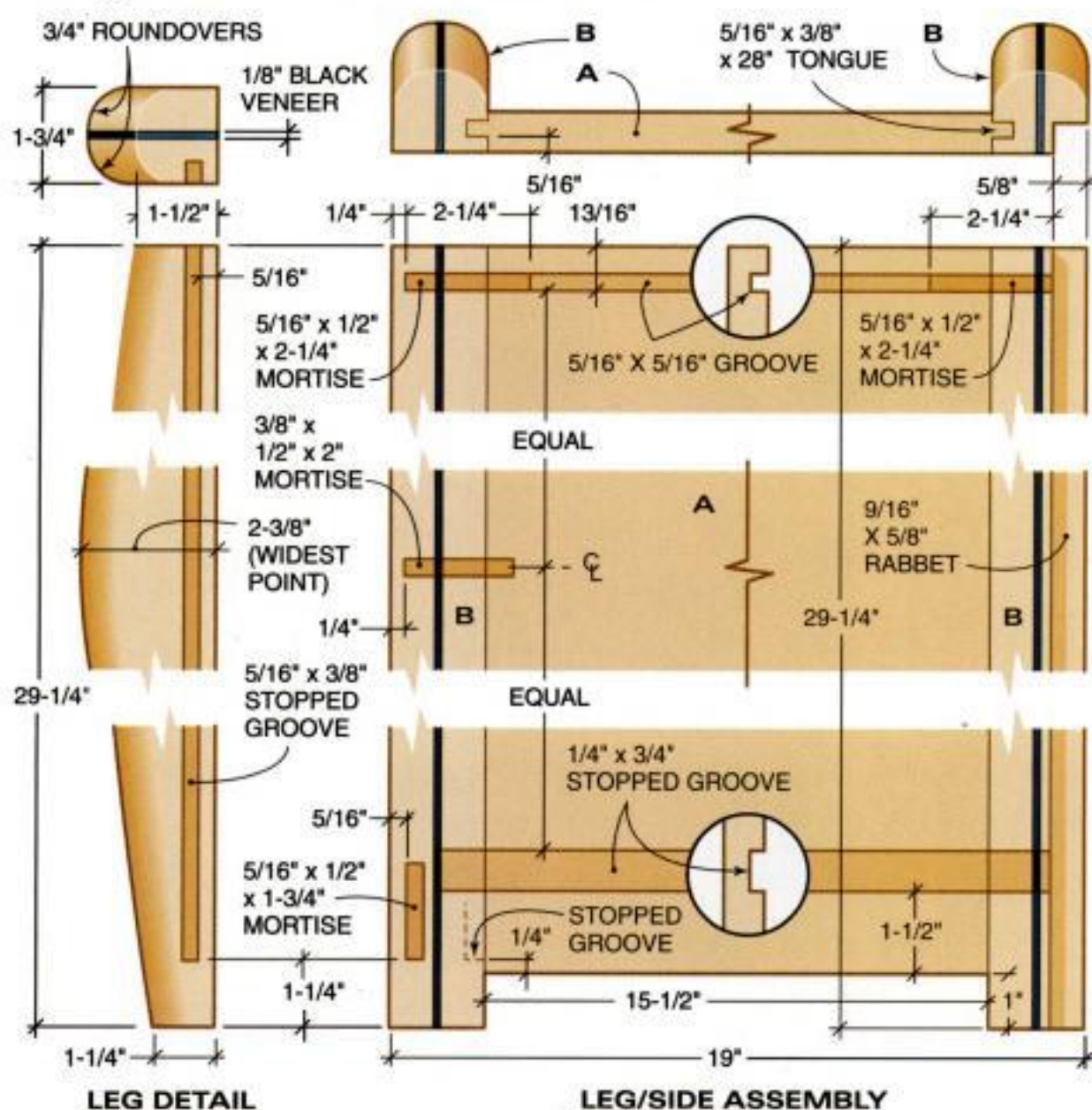
6

Rout stopped grooves for the drawer joints. Use an edge guide with your plunge router. This one is shop-made.



# 4-WAY FILE CABINET

**Fig. B—SIDE ASSEMBLY**



The drawers are held together with stopped tongue and groove joints. They're strong enough to withstand the enormous weight that a filing drawer is asked to hold. Only Baltic birch and ApplePly plywood are appropriate for this joinery.

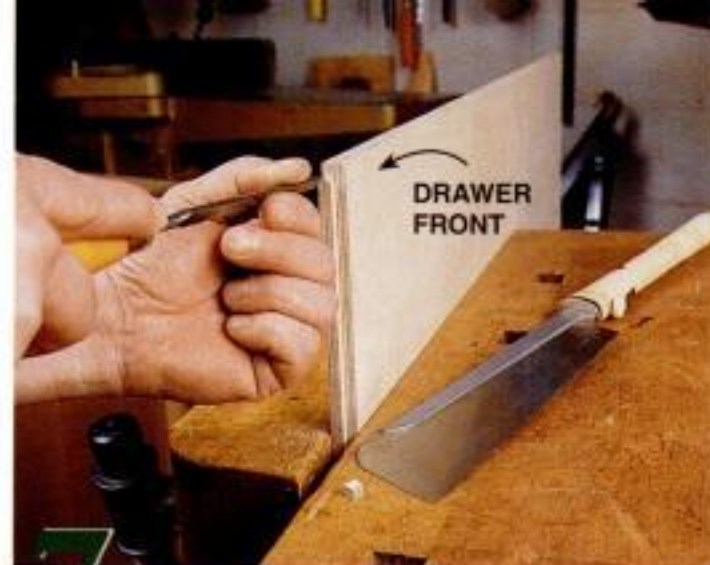
Rout the stopped grooves in the ends of the sides with a plunge router and an edge guide (Photo 6). Then saw the tongues on the fronts and backs with a dado blade. Round over the top end of each tongue (Photo 7).

Drill pairs of holes for the wire supports. Lay out the hole locations, as shown in Fig. C, then use a jig made from clear plastic to aid in drilling each pair (Photo 8).

Glue up each drawer box. Leave the bottom off and clamp all four corner joints. Ensure accuracy by assembling the parts on a plywood gluing fixture that has two 90-degree fences (Photo 9). Put in the drawer bottom after the glue has set.

Cut the dividers to size. Cut stopped grooves for the wire supports in the ends of the dividers. Use a router table and a 1/8-in. slot cutter. You can also cut the grooves on the tablesaw with a standard saw blade. Stand the dividers upright against a tall auxiliary fence. Clamp a stop block to the fence.

Make or buy the drawer pulls. The pulls Robbi made for this cabinet have a dark accent line, like the legs. Glue up two pieces of stock with a



7 Round over the tongue to fit the top of the groove. Cut the small shoulder with a handsaw, then pare a round shape with a sharp chisel.



8 Drill indexed pairs of holes for the divider's wire supports. This shop-made jig is clear plastic so you can line up a scribe mark on its arm with the centerline of the holes. Two 1/8-in. holes in the arm guide the drill bit.



9 Glue up the drawer box in a fixture to keep it square. After the glue has set, remove the box from the fixture and spread glue in the grooves that hold the bottom. Then slide in the bottom from the back and secure it to the back side with screws.



drawer rail and rest the front on top of them. Check to see that the gap between the front and the opening is even at the top. If it isn't, plane the shims and check again.

Position the top so it's centered over the cabinet's width and even with the back legs. Secure the top by screwing up through the front rail, back rail and side rails.

Use a shop-made alignment jig to mark the positions of the drawer slide screw holes (Photo 10). Follow the layout instructions that come with the slides to locate the holes in the jig.

Screw the slides to the drawer case. Then screw the hanger strips to the drawers and install the drawers into the case. To prevent the cabinet from tipping forward should both drawers be opened at once, install anti-tip hardware that allows only one drawer to open at a time. (See File Cabinet Hardware, p. 70.)

Fit the oak drawer fronts to the case opening. Aim for an even gap all around. Place 3/32-in.-thick shims on a

Here are three steps to fine-tuning the fit of a drawer front:

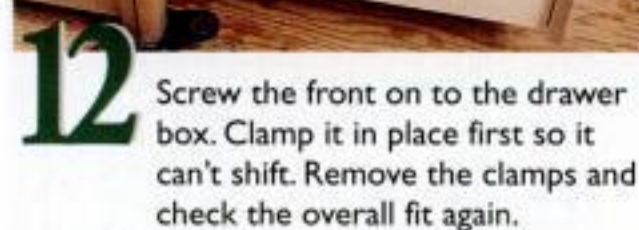
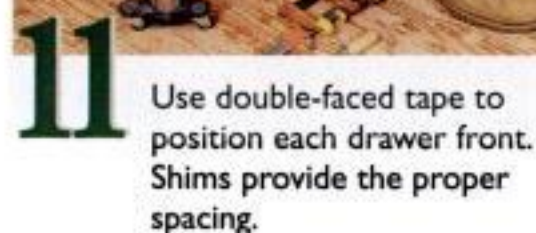
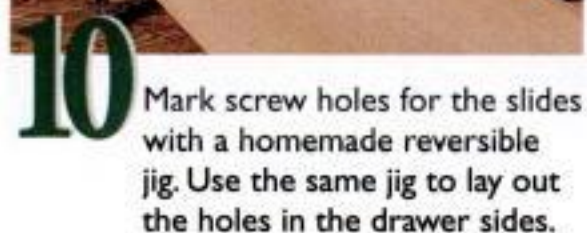
1. Apply small strips of double-faced tape to the front of the drawer box. Leave the shims in place. Stick the drawer front to the box by tapping it a few times over the tape (Photo 11).
2. Gently pull the drawer out of the cabinet. Clamp the front to the box and drive two screws through the box into the front (Photo 12). Remove the clamps, close the drawer and check the fit.
3. If the gap isn't even, scribe around the drawer front. Remove the front from the box and take off the tape. Trim the front to your scribe marks with a hand plane or belt sander. Once the fit is correct, drive the remaining screws to permanently secure the front to the back.

Technical drawing of a window frame showing dimensions and movement arrows. The drawing includes the following labels and dimensions:

- Top horizontal dimension:  $15-1/4"$
- Top horizontal dimension (left section):  $12-1/4"$
- Right vertical dimension:  $\varnothing$
- Internal vertical dimension (left section):  $15-1/4"$
- Internal vertical dimension (left section, lower):  $12-1/4"$
- Arrow labeled **U** (vertical movement)
- Arrow labeled **V** (horizontal movement)

The last assembly step is to attach the back. You don't want screws to show on a frame-and-panel back, so here's a simple way to glue the back in place: Lay the case face down on a flat surface, apply glue to the rabbets, and drop in the back. Weight the back down with a few cement blocks. Use strips of  $\frac{3}{4}$ -in. plywood under the blocks to distribute their pressure.

Once you've applied a finish, put your new cabinet to work. Add the accessories and hardware to the drawers, gather your files and arrange them to suit your fancy. **AW**





# FILING CABINET HARDWARE

All the stuff you'll need to make the ultimate storage box.

by Andy Rae

Filing cabinets come in many styles and colors, but the best cabinets have one thing in common: great hardware. It's all here, including safety gear that prevents a cabinet from accidentally tipping over when the drawers are opened.

Like all projects, order the hardware before you begin to build. Look before you leap! We've listed design requirements with each type.

All of this filing cabinet hardware is easy to get through the mail. And it's quite affordable.

## SOURCES

Woodworker's Hardware;  
(800) 383-0130  
Over-travel drawer slides: KV8505 16;  
\$18.47 for a pair of 16-in. slides  
Folder hangers: CPS32500 2.5; \$4.91  
for 98-in. length.  
File follower: KV0476F ZC; \$12.92  
File follower track: KV0476T; \$3.84

Timberline Lock; (800) 562-5227  
Anti-tip hardware: SN400, \$3.81 (lever)  
and DC400, 59 cents (drawer clip).

Constantine's; (800) 223-8087  
Single drawer lock: 32H14; \$5.15

Lee Valley; (800) 871-8158  
Wire supports: 6 1/4 in. 00S05.06; \$1.75,  
package of 10.  
Single brass pull: 00G18.01; \$2.90

Rockler; (800) 279-4441  
Double drawer lock: 17823; \$6.99  
Combined pull and card holder: 27930;  
\$2.69 Single card holder: 27953; \$1.99

### File follower takes up slack.

Keep your hanging-file folders from falling into the back of a drawer by installing this steel follower. The track comes 26-in. long and can be cut with a hacksaw to fit the drawer. Make your drawer bottom 1/2-in. thick to hold the screws for the track. If you'll be using standard rather than hanging-file folders, cut a 1/4-in.-deep groove into the bottom of the drawer to recess the track.

### Anti-tip hardware prevents accidents.

Your cabinet won't tip forward if only one drawer can open at a time. One wing always remains locked into the plastic block mounted to the drawer side. All the pieces are flush mounted and require 1/2-in. clearance. Drawer slides must be mounted at least 8-in. apart to clear this hardware.

### Over-travel drawer slides provide full access.

Get to the very back of a drawer, even on cabinets with overhanging tops, by installing these ball-bearing drawer slides rated for 150-lb. loads. The slides extend the back of the drawer 1 in. beyond the cabinet's face, allowing you to access the entire contents. They require 1/2-in. clearance between each side of the drawer and cabinet.



### Drawer locks add security.

Install this cam lock on flush or overlay drawers. Drill a  $\frac{3}{4}$ -in.-dia. hole through a drawer front that's anywhere from  $\frac{3}{4}$ -in. to  $1\frac{3}{8}$ -in. thick. Then rout a mortise into the top or the rail to receive the cam. You can forgo the mortise altogether by using a narrow rail above the drawer. The cam can lock behind the rail.

A double lock secures two drawers with a single turn of the key, and installs easily by drilling a  $\frac{3}{4}$ -in.-dia. hole into the side of a cabinet with  $\frac{3}{4}$ -in. sides. This lock must be installed on the opposite side of the anti-tip hardware. It requires  $\frac{1}{2}$ -in. clearance.



DOUBLE DRAWER LOCK

### Wire supports for dividers organize a drawer.

Make a fast, invisible connection between drawer sides and dividers. Drill a series of  $\frac{1}{8}$ -in.-dia. holes along the inside of your drawer. Insert the ends of the wire into the holes. Cut saw kerfs into the ends of the dividers and slide the dividers down the wires. The supports are  $6\frac{3}{4}$ -in. long.

### Folder hangers let hanging files slide smoothly.

Cut these plastic hangers to length on your bandsaw and slip them over the top edges of your drawer. No glue is required, but the drawer sides must be  $\frac{1}{2}$ -in. thick.

### Pulls and card holders keep track of the contents.

Mount a brass pull on the surface of the drawer for a classic look. Slide a card down into a separate holder to identify the drawer's contents. Integrated pulls and card holders are available as well, as shown on the top drawer. **AW**



## TOOL TEST

# 6-in. Jointers

**A** jointer is a must-have for many woodworkers. Few can do without the smooth, straight edges and faces they get from their jointers. We tested twelve 6-in. floor models that sell for under \$600.

A 6-in. jointer will handle material up to 6-in. wide, the width of the cutter head. A 6-in. jointer serves the needs of many woodworkers, but more advanced and professional woodworkers often choose an 8-in. jointer (for a review, see AW #58, April 1997, p. 58). These machines cost from \$700 to \$2000.

There are 6-in. jointers available as benchtop models, but we recommend a floor model if space permits. They are quieter and can handle longer boards.

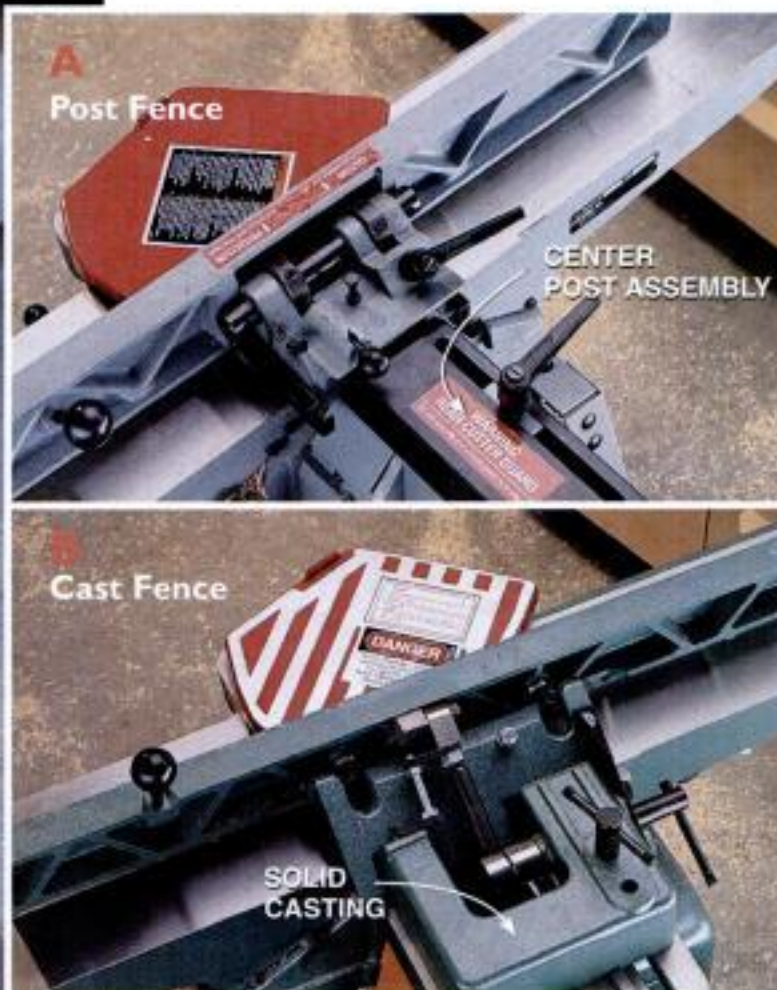




## The Big Features

### Table Adjustments

Infeed and outfeed table adjustments can be made using handwheels or levers. Most of us preferred the handwheels because they make fine adjustments easier. This is particularly important on the outfeed table. Better yet are models with handwheels on the front of the jointer instead of under the tables—they're really easy to get at.



### Fences

The fence aligns your material to the bed of the jointer, so it needs to be easy to adjust and rigid. There are two styles of fences. One rides on a post (Photo A), the other is carried by a casting (Photo B). Most testers preferred the fences on castings. Most, but not all jointers, have positive stops at 45, 90, and 135 degrees (Photo C). A handle on top of the fence helps you adjust to different angles. Unfortunately, this handle is typically in the way when edge jointing. Fences that are higher and longer lend more support to the material.

Whichever system is used to support the fence, it's crucial that the fence be rock stable.

### Beds

Infeed and outfeed tables must be parallel to each other. Jointer beds can become out of alignment because the cast iron warped after manufacturing or because of damage in shipping. One machine in our test had this problem and a call to the manufacturer resulted in a new machine. Be sure to check your jointer and call your dealer if there's a problem.

Also, longer beds are always better because they make it easier to handle the stock. As a



We prefer jointers with positive stops for jointing common angles.

EDITOR: GEORGE VONDRISKA • ART DIRECTION: BARBARA PEDERSON  
PHOTOGRAPHY: KRISTEN PHOTOGRAPHY • ILLUSTRATION: FRANK ROHRBACH



# 6-in. Jointers

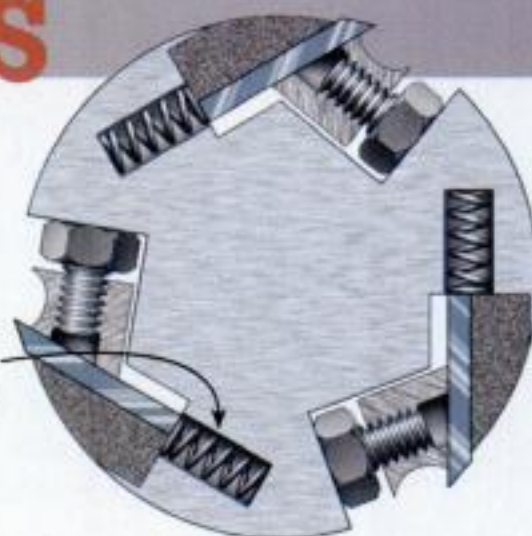
FIG. A KNIFE ADJUSTMENT

rule of thumb, you can get good results jointing material that's twice as long as the jointer bed.

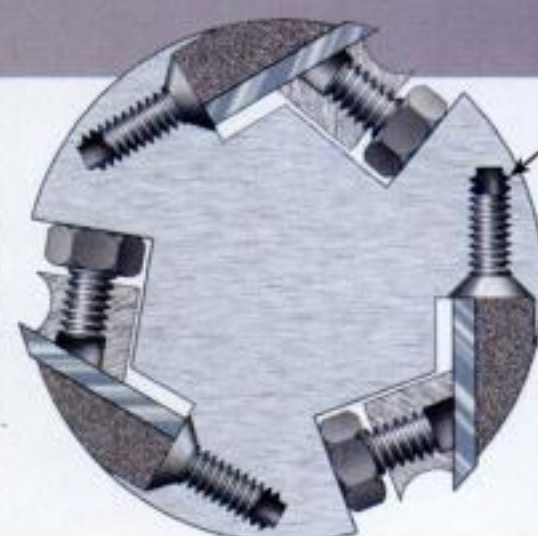
## Ease of changing knives

When resetting knives, they may be supported by either jack screws or

SPRINGS  
SUPPORT  
JOINTER  
KNIVES



BOLT  
SUPP  
JOINT  
KNIVE



## Getting Your Jointer to Work Right

All of our jointers were functional, but occasionally you get a lemon that won't do what a jointer is supposed to do. It's a matter of small tolerances. The most obvious symptom is that no matter how good your technique, you can't produce a straight edge. Here's how you can check your machine to make sure it's working right:

You can test for parallel by unplugging the jointer and



Your jointer bed travels up and down on dovetail ways. The quality of machining, or lack of it, is a major factor in whether the beds are parallel or not



2

placing a high-quality straightedge (see Sources, page 77) on the outfeed table. Try to slip a feeler gauge under the straightedge, starting with the smallest gauge. If the tables are absolutely perfect, even the thinnest of gauges won't slip under the straightedge. Use progressively thicker feeler gauges until one won't slip under the straightedge. The thickness of the largest gauge that can slip under the straightedge is the amount your bed is off.

According to the tool experts we interviewed, if you slip more than .003 in. of feeler gauge under the straightedge, you'll have a problem jointing a true surface.

Repeat the process placing the straightedge diagonally across the beds to check for twist.

What to do if you have a problem? Check out AW #58, p. 65 for information on how to shim jointer tables, as well as how to set your knives. Or talk to your dealer about the problem.

## The Fence

If there isn't any twist in the beds, you can check for a twist in the fence using a square. Adjust the fence so its face is tight to the square at one end. Move the square down the fence, looking for light between the fence and the blade of the square. If there's a gap, a feeler gauge will tell you how big it is. Gaps bigger than .003 in. could give you a problem.



3



1





springs (See Fig. A). Jointers that come with springs under the knives also include a knife setting device. Most users found that springs made it easier to reset the knives. However, four of our five top jointers had screws under the knives. Jack screws are easy enough to live with on a jointer with other great features.

### Assembly and Job Readiness

Many of the jointers look alike and assembly of many was very similar. Closed-stand models are generally easy to assemble. The open-stand models take lots more time to put together—as much as an hour or two more.

How much tweaking will you need to do before cutting wood? This is primarily determined by how well the knives were set at the factory. Only one jointer needed the knives completely reset before cutting wood.

## The Test

First we put each of the tools together. (A huge task!) We used the owner's manuals and checked for missing parts.

After the jointers were properly set up and ready for action, we turned a group of seven woodworkers loose on them. The testers ranged in skill level from novice to advanced, and gave us lots of feedback on what they liked and didn't like about the tools. All the AWV editors also had a go at the jointers and submitted their opinions.

Finally, we measured the jointer tables to see if they were parallel. Although many of the jointers looked a lot alike, there were small but significant differences that distinguish the best jointers.

|                            | JOINTER                | PRICE | TABLE<br>ADJUSTMENT           | FENCE<br>HEIGHT AND<br>LENGTH<br>POSITIVE<br>STOPS | BED<br>LENGTH | KNIFE<br>ADJUSTMENT | COMMENTS                                                                                                               | HP    | OPEN OR<br>CLOSED<br>STAND | FIT AND<br>FINISH | CONTACT                               |
|----------------------------|------------------------|-------|-------------------------------|----------------------------------------------------|---------------|---------------------|------------------------------------------------------------------------------------------------------------------------|-------|----------------------------|-------------------|---------------------------------------|
| <b>BEST<br/>BUY</b>        | Bridgewood<br>BW6R     | \$399 | 2 handwheels,<br>under tables | 4" x 29" 45,90,135                                 | 46"           | Screws              | Well machined beds.<br>Smooth and quiet cutting.                                                                       | 1     | Closed                     | Excellent         | Wilke Machinery<br>(800) 235-2100     |
|                            | Craftsman<br>22724     | \$499 | 2 handwheels,<br>under tables | 4" x 28" 45,90,135                                 | 45 3/4"       | Springs             | No way to put on dust collection.<br>Open stand tedious to assemble.                                                   | 3/4   | Open                       | Good              | Sears retailers                       |
| <b>EDITORS'<br/>CHOICE</b> | Delta-closed<br>37-195 | \$550 | 1 lever,<br>1 handwheel       | 5" x 35" 45,90,135                                 | 46 1/2"       | Screws              | Large fence. Easy to get at switch.<br>Rack and pinion fence works well,<br>but takes up lots of space.                | 1     | Closed                     | Excellent         | Delta<br>(800) 438-2486               |
|                            | Delta-open<br>37-190   | \$450 | 1 lever,<br>1 handwheel       | 4 1/2" x 27 1/2" 45,90,135                         | 46"           | Screws              | Took long to assemble                                                                                                  | 3/4   | Open                       | Excellent         | Delta<br>(800) 438-2486               |
| <b>EDITORS'<br/>CHOICE</b> | General<br>80-100LM    | \$520 | 2 handwheels,<br>in front     | 4" x 29" 45,90,135                                 | 55 1/4"       | Screws              | Extra long bed. Bed extensions<br>must be added. No instructions.<br>Rigid fence.                                      | 3/4   | Closed                     | Excellent         | General<br>(819) 472-1161             |
|                            | Grizzly<br>G1182Z      | \$395 | 2 levers                      | 4" x 29 1/2" 45,90,135                             | 47 1/2"       | Springs             | Had to reset knives before using.<br>Fence was tough to move. Infeed<br>table had to be locked to prevent<br>movement. | 1     | Closed                     | Poor              | Grizzly<br>(800) 523-4777             |
| <b>EDITORS'<br/>CHOICE</b> | Jet J16CSX             | \$500 | 2 handwheels,<br>in front     | 4" x 29" 45,90,135                                 | 46"           | Screws              | Comes with 2 extra sets of<br>knives. Very smooth operation.                                                           | 3/4   | Closed                     | Excellent         | Jet<br>(800) 274-6848                 |
|                            | Lobo JT2206            | \$400 | 2 handwheels,<br>under tables | 4 x 27 3/4" 90,135                                 | 46"           | Springs             | Fence has stops only at 90 and<br>135 degrees. Left chatter marks<br>when face planing.                                | 1     | Closed                     | Good              | Lobo<br>(800) 786-5626                |
|                            | Ridgid JP0600          | \$400 | 2 handwheels,<br>under tables | 4" x 28" 90,135                                    | 46"           | Springs             | Fence has stops only<br>at 90 and 135 degrees.                                                                         | 3/4   | Closed                     | Good              | Home Depot                            |
|                            | Star                   | \$485 | 1 lever,<br>1 handwheel       | 4" x 29" 45,90,135                                 | 46"           | Screws              | Guard leaves knives<br>exposed. Optional handwheel<br>is available for infeed side.                                    | 1 1/2 | Closed                     | Good              | Star<br>(888) 678-8777                |
| <b>BEST<br/>BUY</b>        | Sunhill<br>924028      | \$349 | 2 handwheels,<br>under tables | 4" x 28" 45,90,135                                 | 52 1/4"       | Springs             | Long bed. Great value.<br>Good job on face planing.<br>Ran smooth and quiet.                                           | 1     | Closed                     | Good              | Sunhill<br>(800) 929-4321             |
|                            | Woodtek<br>924028      | \$429 | 1 handwheel,<br>1 lever       | 4 1/2" x 29 1/2" 45,90,135                         | 46"           | Screws              | Fence is difficult to<br>move. Infeed lever was<br>difficult to move. Overall<br>finish was poor                       | 3/4   | Closed                     | Poor              | Woodworker's Supply<br>(800) 645-9200 |



# 6-in. Jointers

## EDITORS' CHOICES



### Editors' Choice General 80-100LM

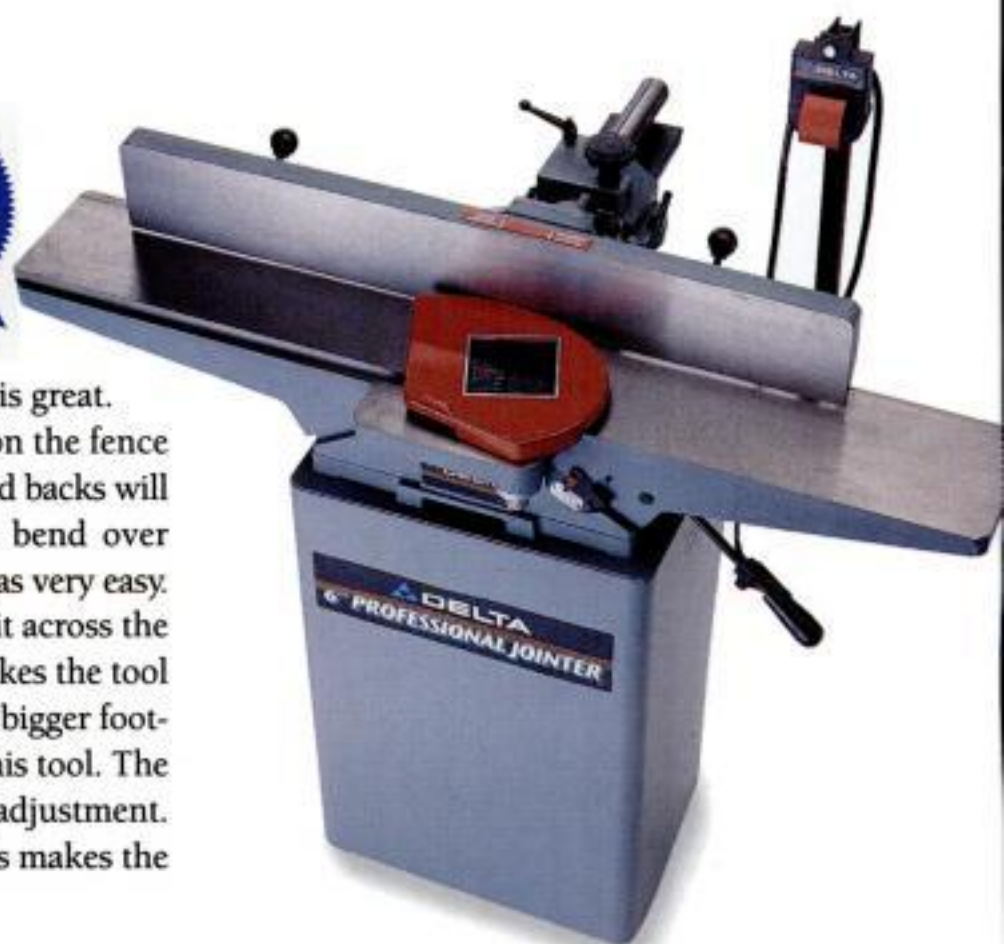
This jointer had the longest bed in the bunch. There wasn't much packing grease to clean off, so job readiness was great. We liked the front-mounted handwheels and the smooth-operating fence. Fit and finish on all the parts was great.

If you need explicit instructions to set up tools, this tool may be a problem because assembly instructions consist only of an exploded view of the tool. If you have a little familiarity with jointers though, you'll be okay.

### Editors' Choice Delta 37-195

This is a unique machine, with several distinctive features that you will either love or not. The fence is great. It's significantly longer and taller than most. The handles on the fence are not in the way when edge-joining. Woodworkers with bad backs will also like the high switch placement. You won't have to bend over every time you want to turn the tool on and off. Assembly was very easy.

The fence has a unique rack and pinion system to move it across the bed. While this does make moving the fence easy, it also makes the tool stand farther away from a wall than most jointers, creating a bigger footprint. If you're very short on floor space, you may not like this tool. The lever on the infeed table locks in place with every  $\frac{1}{32}$  in. of adjustment. Squeeze the handle on the end of the lever to release it. This makes the lever easier to use than other lever-style jointers.



### Editors' Choice Jet JJ-6CSX

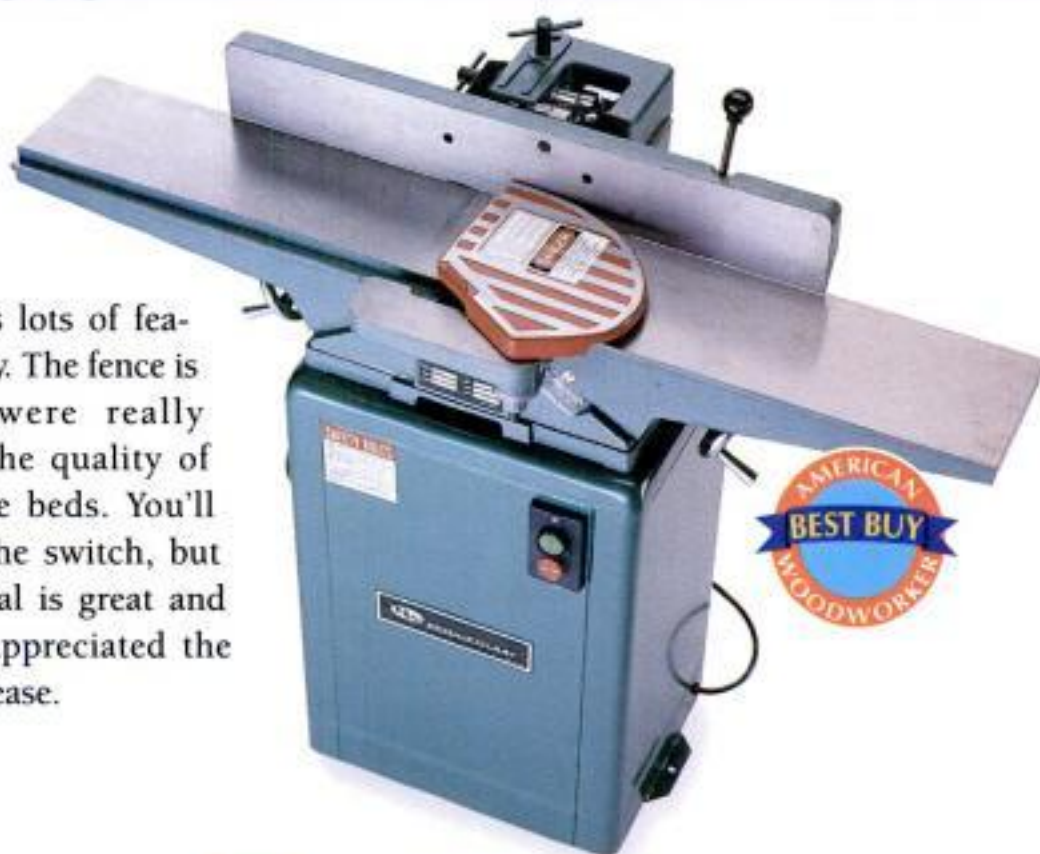
All the features we like are here, including handwheels on the front, a smoothly operating and rigid fence and plenty of power to get any job done. Assembly was straightforward, thanks to a well written and illustrated owner's manual. The castings on the Jet look identical to the General, except for the lack of bed extensions. Jet's Limited Edition jointer comes with two extra sets of knives.



# BEST BUYS

## Best Buy Bridgewood BW6R

This jointer offers lots of features for the money. The fence is rigid and we were really impressed with the quality of machining on the beds. You'll need to wire in the switch, but the owners manual is great and covers this. We appreciated the lack of packing grease.



## Best Buy Sunhill 924028

You'll get the second longest bed in our test with this jointer. The bed length comes from adding extensions to the infeed and outfeed tables. The assembly instructions say nothing about the extensions, but they're easy enough to put on. There aren't any instructions for the electrical switch either, and it needs to be installed. Again, it's easy to do if you're accustomed to light electrical work. **AW**



## Rabbeting on the Jointer?

Most jointers have a rabbeting ledge built into the bed of the machine and most people never use it.

As luck would have it though, while this test was in progress, I was in the middle of making some doors that needed to be rabbeted for glass. What the heck, says I, I'll do it on the jointer. Lo and behold, it made a believer out of me! It's easy to make wide rabbets and with great surface finish, too. It'll take more than one pass to complete most rabbets, so if you're running lots of pieces, a tablesaw set up might still be the best bet. But for some applications, rabbeting on the jointer is the way to go.



Set the fence to produce the correct rabbet width. On a wide rabbet in hardwood, as shown, you take off 1/16 in. per pass until you reach the depth you're after.

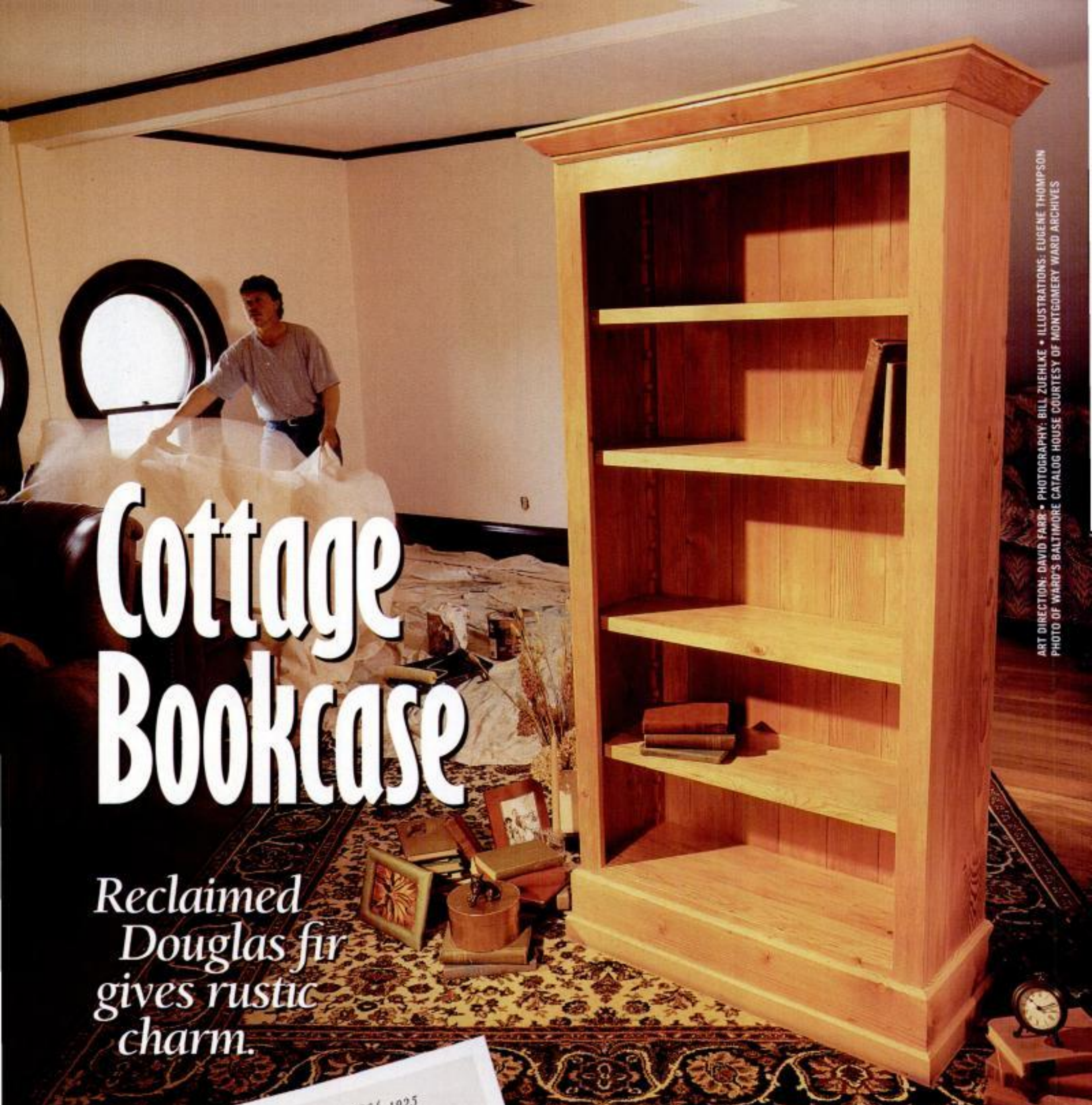
## Sources

If you're going to test your jointer beds to within .003 in., you need a straightedge machined to at least that tolerance. They're not inexpensive (around \$100), but they are what you need for this kind of testing. Here are a few suppliers:

The Pinsky Edge  
(800) 874-6753

Starrett Tool  
(978) 249-3551





# Cottage Bookcase

Reclaimed  
Douglas fir  
gives rustic  
charm.

Montgomery Ward warehouse, Baltimore, Md, 1925



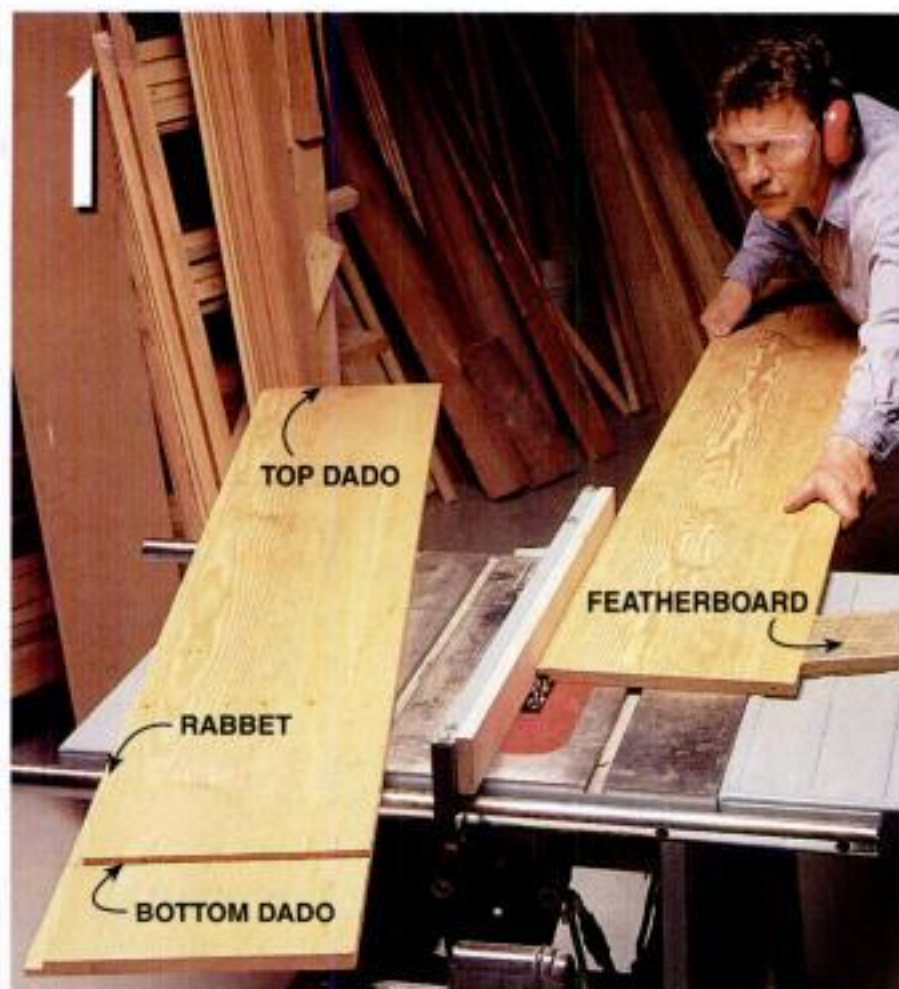
EVERY BOARD OF THIS BOOKCASE IS full of character—nail holes, gouges and even hammer marks. That's because each piece was pulled from an old Montgomery Ward warehouse in Baltimore.

Originally part of a large shelving system built more than 75 years ago, our reclaimed boards still retained a dusty aroma and had mellowed to a rich warm color (see

BY DAVID RADTKE

ART DIRECTION: DAVID FARR • PHOTOGRAPHY: BILL ZUEHLKE • ILLUSTRATIONS: EUGENE THOMPSON  
PHOTO OF WARD'S BALTIMORE CATALOG HOUSE COURTESY OF MONTGOMERY WARD ARCHIVES





**CUT**  $\frac{3}{8}$ -in.-deep rabbets and dados into the side panels to accept the solid wood back pieces as well as the top and bottom panels. Use a featherboard to keep the panel tight to the fence to ensure an even edge on the rabbets. The bottom horizontal panel should fit snugly into the dado, so adjust your dado blade precisely or make multiple passes.

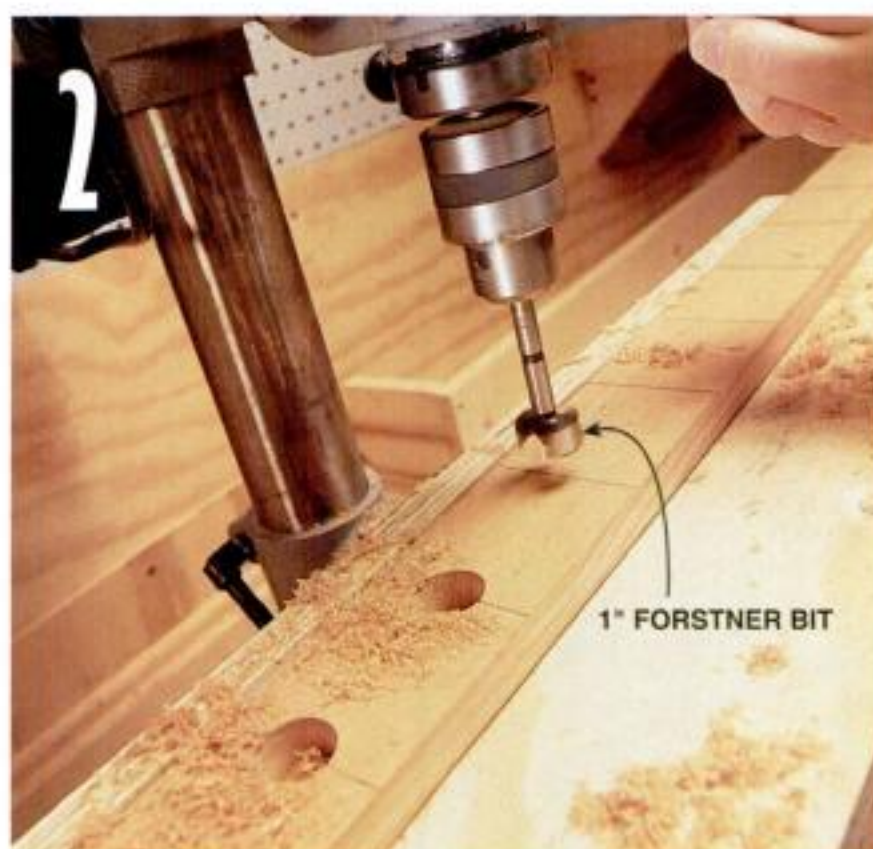
"Reclaimed Timber," p. 83 for more information). These unique characteristics influenced the design of our bookcase—straightforward and reminiscent of rustic folk furniture. The bookcase is constructed from  $\frac{3}{4}$ -in. boards. Unlike most plywood-backed bookcases, the back of this bookcase is assembled from individual pieces splined together.

To build this piece you'll need a tablesaw, a jointer, a router and a biscuit joiner, although you could use a doweling jig. A large assembly table or a make-shift work surface made from a  $\frac{3}{4}$ -in. plywood sheet laid over sawhorses is a must. Figure on spending about three days in your shop to complete this piece.

### Working with Reclaimed Fir

Because the surface of the boards was in pretty rough shape, each  $\frac{3}{4}$ -in.-thick piece was first surfaced to  $1\frac{1}{16}$  in. To keep everything simple, the dimensions in the illustrations and the Cutting List assume  $\frac{3}{4}$ -in.-thick material.

When you buy reclaimed wood, keep in mind you may not be able to get all the lengths or widths you'd like. Be sure to specify longer pieces to make the sides and face frame. Shorter pieces can be made into shelves and moldings. Order about 30 percent extra to make up for a lot of end cuts and just plain bad stuff (too much character!). Because you'll be making wide panels, choose pieces that are cup free. Nearly all the wood I picked up was flat, dry and after that many years, well seasoned.

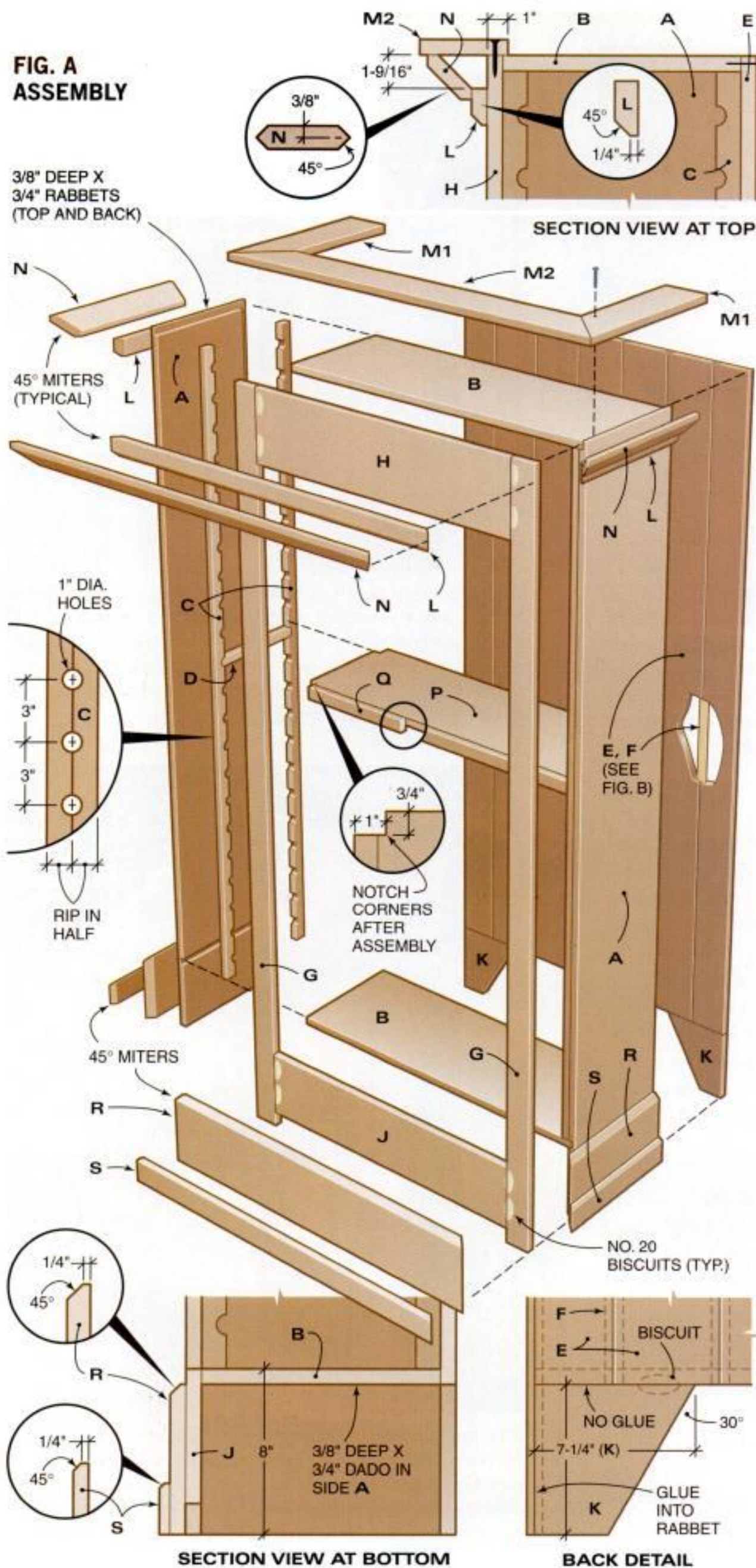


**BORE** evenly spaced 1-in. holes for the shelf supports. Mount a board onto the table of your drill press and attach a fence to it for exact centering of each hole. Once the holes are drilled, cut each piece to length, then rip it down the middle to make a matched pair for each side. Glue and clamp each pair to the inside edge of each side panel.



**SCREW** the top into the upper dados of the sides and glue and clamp the bottom into the lower dados. Measure the diagonals. They must be equal to square the case. Once the glue is dry, flip the case face down. Make sure the case is square and screw blocks along the sides and top into the work surface to keep it square as you install the back panels.



FIG. A  
ASSEMBLY

Douglas fir splinters easily, and even more so when it's as old and dry as this stuff. Keep a tweezers handy.

### Preparing the Case Sides

After matching the grain (the sides (A) are the most critical) be sure to joint the edges for a straight and square edge glue-up. Make the panels a bit wider than needed, then rip them to exact width on your tablesaw. Next cut the dados (Photo 1) in the top of the sides. Now cut another dado 8-in. up from the bottom of each inner side panel. Finish the grooving process with rabbet cuts along the whole length on the inside backs of each panel.

### Making the Vertical Shelf Standards

Rip two pieces 2½-in. wide from your stock to make parts C. Keep them longer than needed and trim to length later. Mark them every 3 in. (Photo 2) with a square. Set up a fence and a plywood base attached to your drill press table. Set the fence so the 1-in. Forstner bit will drill holes in the center of the piece. After drilling the length of holes for each standard, cut them to length. Leave equal distance from the holes on the top and bottom ends. Mark the tops.

Rip each piece in half on your tablesaw. Finish sand these pieces, then glue and clamp them to the cabinet sides, as shown in Fig. A. Don't cut the horizontal shelf supports (D) yet.

### Assembling the Case

Lay out the side panels (A) and the top and bottom panels (B) on a large flat work space. Apply glue to the dados and ends of the bottom panel. Clamp this lower assembly face up (Photo 3) and make sure the top and bottom panels are flush with the front edges of the sides. Screw the sides to the top panel (they'll be hidden by the cornice). Before the glue sets, make sure the case is square.

### Making and Installing the Back

Rip your back pieces to 5 in. Make sure they're good and straight. Install a



$\frac{1}{4}$ -in. rabbeting (slot cutting) bit with a  $\frac{3}{8}$ -in. depth of cut. Make a simple jig like the one shown in Photo 4 to hold the pieces flat to your workbench. Cut the slots in the center of the edge moving from right to left to avoid tear out. A couple passes should do the trick. Finish routing each slot with a left to right pass to make sure the bit has cut its full depth. Flip the piece end for end and rout the other edge. Mark the front and back of each piece.

From new pine boards, rip the splines (F) a hair thinner than the slots. Don't use the fir to make the splines because it may split and new pine will be more forgiving during assembly. Glue the splines into the slot on one side only. Leave the spline out of the last board (Fig. B) because you'll need to rip it to width later. Let the glue dry.

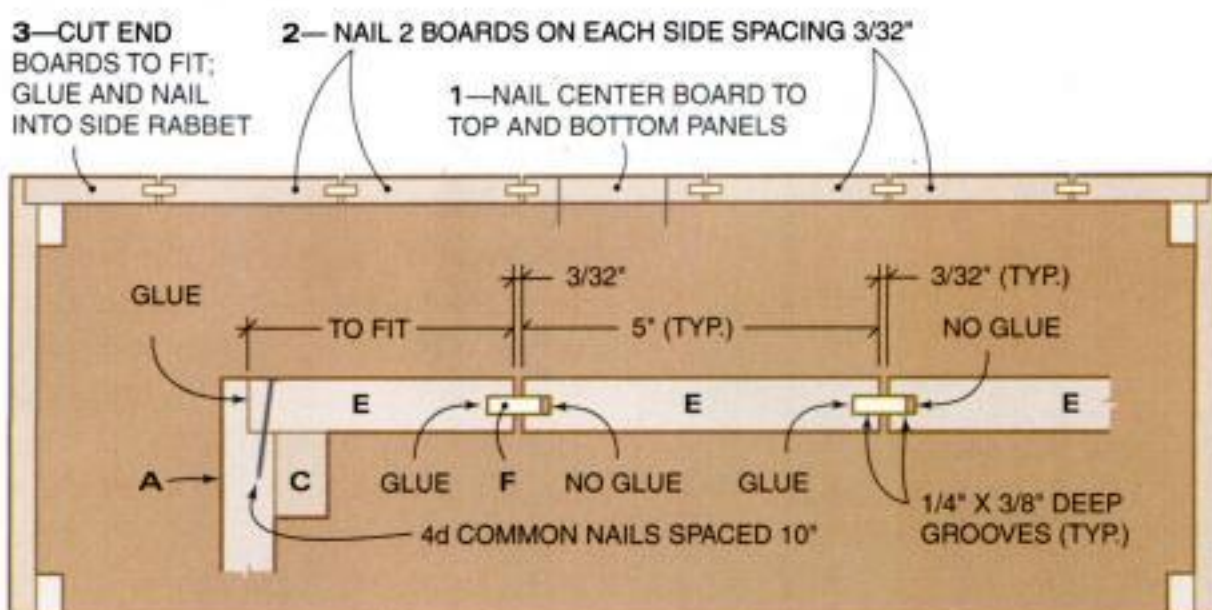
Now flip the case over so the back faces up. Screw some blocks into the workbench tightly against the case after rechecking it for square. The blocks keep the case from shifting out of square as you nail the back pieces to the top and bottom panels. Make sure the back pieces are cut to length.

Don't glue the three center panels together—just nail them in place with #4 common nails leaving  $\frac{3}{32}$ -in. space between the edges so you can see the splines. Now measure for the remaining pieces. Rip the outer two pieces. Glue the splines of the two outer panels, as shown in Fig. B (maintain the  $\frac{3}{32}$ -in. spacing). Fit them in place, then glue and nail each outer pair of panels to the case sides. Biscuit and glue the diagonal corner brace (K), as shown in Fig. A.

## Making and Installing the Face Frame

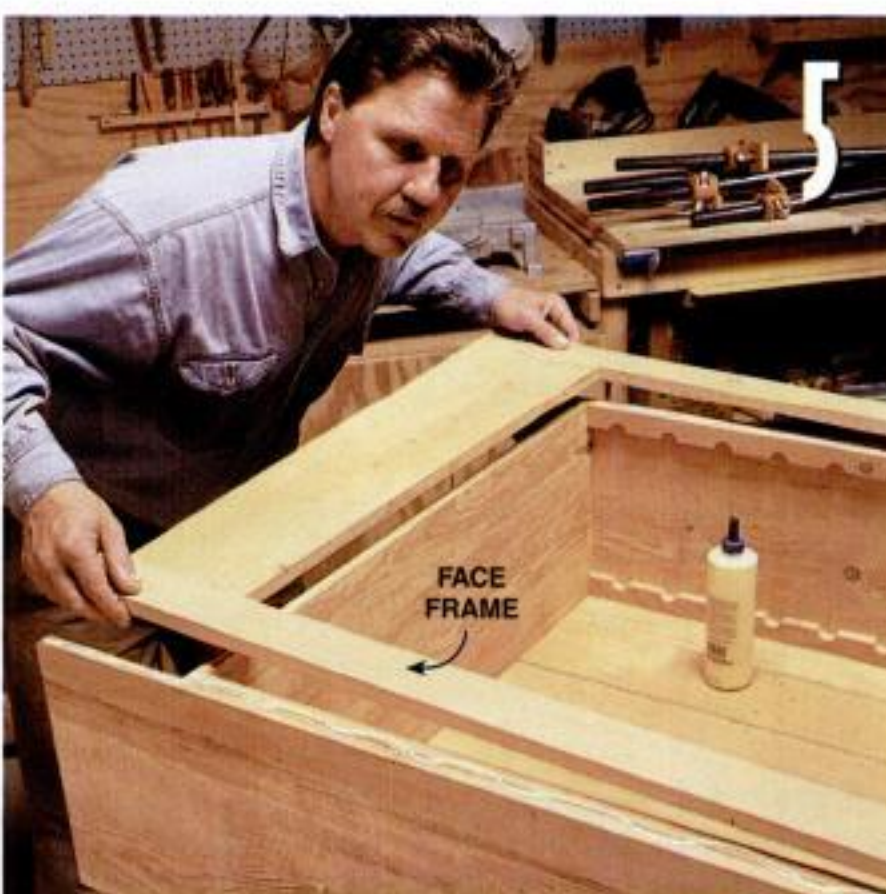
Rip the stiles for the face frame from wide stock. Choose pieces with similar grain. Cut the wider horizontal rail pieces about  $\frac{1}{16}$ -in. longer than the width of the case (minus the stiles) so you'll have a bit extra to trim after the face frame is glued to the case.

**FIG. B BACK DETAIL**



## RIP, then JOINT

the edges of all the back pieces. Rout a  $\frac{1}{4}$ -in. groove into the center of each side edge. Glue a slightly thinner than  $\frac{1}{4}$ -in. by  $\frac{1}{16}$ -in. pine spline into one side of each back piece. Once the glue has dried, fit each back piece to the back of the case. Start in the center and work your way to the sides.

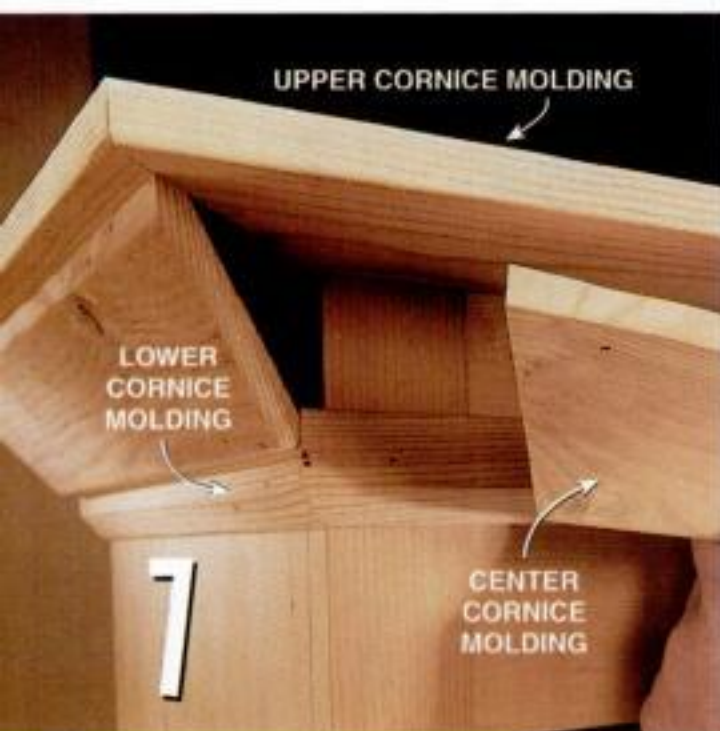


**GLUE** the face frame to the front edges of the case. Be sure it's perfectly aligned, then clamp it to the case every foot along the perimeter. Trim the slight overhang on each side with a block plane once the glue is dry.





**SHAPE** the cornice moldings on the tablesaw. Set the blade at 45 degrees. Run each board through on both faces to create bevel edges, then repeat for the other edge. The other narrow cornice molding is a simple 45-degree piece cut from a 1 3/4-in. piece of 3/4-in. stock.



**FIT** the center cornice molding (N) to the upper cornice molding (M1) and to the lower cornice molding (L). See Fig. A for exact dimensions.

Now align the edges of the rails with the stiles and mark your biscuit locations (or use a doweling jig). Glue and clamp the assembly, check the diagonal measurements and square it. Set the assembly aside to dry.

Finish sand the face frame and glue and clamp it to the front edge of the case (Photo 5).

### Making and Installing the Moldings

Cutting the profiles of these moldings is simple. The lower cornice molding (L) is cut from a 1 3/4 in. wide by 3/4 in. thick board. Set the tablesaw blade at a 45-degree angle. Set the fence so you'll leave a 1/4-in. flat section at the bottom of the molding, as shown in Fig. A. Use a similar technique to make the base moldings R and S. Notice that the lower base molding is first resawn to a 1/2-in. thickness.

To make the wider center cornice molding (N), rip a 6-ft. long piece at about 3 1/4 in., as shown in Photo 6. Then set the tablesaw blade at 45 degrees and the fence at 3 in. from the middle of the cut (3/8 in. up from the table surface). Now make a 45-degree rip on all four sides of the piece. Finish sand all the edges of the moldings.

Install the cornice and base moldings as shown in Photo 7 and Fig. A. Do not glue these pieces to the case. The sides of the bookcase will move with seasonal humidity changes and because the grain direction of the side moldings is running opposite, any glue joints here will fail. It's okay to use nails here because the wood is full of distress marks and any additional holes won't be noticed. Nails will adjust themselves in the moldings to counteract any wood movement. If you don't want to use

nails, you can use screws from the inside of the bookcase, but you'll have to drill elongated screw holes to allow for wood movement.

### Finishing Touches

The shelf supports mentioned earlier are cut from 3/4 in. stock to a 1-in. width. Cut them 1/8 in. longer and belt sand a rounded edge on each end to fit into the shelf support. A little trial and error works best. Work for a snug fit.

Glue up and clamp boards to make the shelf blanks (P). Next glue the nosings (Q) to the shelves. The nosings add extra stiffness to the shelf as well as a heftier appearance. Finish sand the shelves once the glue is dry and notch them to fit around the shelf supports.

Sand the entire bookcase with 150-grit sandpaper followed by 220-grit. Clean away the dust with a tack rag before finishing.

Because of the beautiful natural patina of the wood, I simply used a clear wax finish. I avoided oil because the oil would darken and make this softwood blotchy. The wax gives a clean even look and a sealer isn't necessary. Rub the first coat on with a cloth, let it sit for 10 minutes, then buff it out and repeat the same process the next day. The wax gives the wood a very light sheen. Colored waxes are also available if you want a deeper color tone on your piece. **AW**

### Cutting List Cottage Bookcase 76 3/4" H x 40 3/4" W x 16 3/8" D

|    |    |                           |                                          |
|----|----|---------------------------|------------------------------------------|
| A  | 2  | 3/4" x 12 1/4" x 76"      | side panels                              |
| B  | 2  | 3/4" x 11 1/2" x 33 1/4"  | top and bottom panels                    |
| C  | 2  | 3/4" x 2 1/2" x 67 1/4"   | shelf standards (rip into pairs)         |
| D  | 10 | 3/4" x 1" x 10"           | shelf supports                           |
| E  | 7  | 3/4" x 5" x 68 3/4"       | case back panels (rip outer pair to fit) |
| F  | 6  | 7/16" x 11 1/2" x 68 3/4" | pine splines                             |
| G  | 2  | 3/4" x 2 1/2" x 76"       | face frame stiles                        |
| H  | 1  | 3/4" x 7 1/4" x 29"       | upper face frame rail                    |
| J  | 1  | 3/4" x 6 1/2" x 29"       | lower face frame rail                    |
| K  | 2  | 3/4" x 6" x 7 1/4"        | back corner braces                       |
| L  | 1  | 3/4" x 1 1/4" x 6"        | lower cornice molding*                   |
| M1 | 2  | 3/4" x 4 3/8" x 17"       | upper cornice moldings (sides)*          |
| M2 | 1  | 3/4" x 4 3/8" x 42"       | upper cornice molding (front)*           |
| N  | 1  | 3/4" x 3 1/4" x 6"        | center cornice molding*                  |
| P  | 5  | 3/4" x 10 3/8" x 32 7/16" | shelves                                  |
| Q  | 5  | 3/4" x 1 1/4" x 32 7/16"  | shelf nosings                            |
| R  | 1  | 3/4" x 7 1/4" x 6"        | base molding (cut to fit)                |
| S  | 1  | 1/2" x 2 1/2" x 6"        | lower base molding (cut to fit)          |

\* cut to fit



# RECLAIMED TIMBER

For an instant antique,  
try recycled wood!

By George Vondriska

**W**ood doesn't just grow on trees, you know. It also comes from barns, warehouses, factories and railroad trestles that are being torn down. This wood, called reclaimed timber, just might be an alternative material you can use.

Reclaimed timber offers some unique opportunities. Because of its original application, the boards probably have a lot of "character." This means nail, screw and even bolt holes. Instead of trying to work around and eliminate them, you might try using them to give the project a unique look.

The wood itself is different, too. This lumber was almost always cut from old-growth trees. These trees grew very slowly in dense forests. The resulting growth rings are close together, making the wood more dense and stable. In addition, today's softwoods are dried to around 12- to 14-percent moisture content, making it unsuitable for cabinets and furniture. This old stuff is generally drier than that.

Most suppliers are able to attach a history to the reclaimed timber they sell. Not only can you create a unique piece, you'll also be able to identify what building, city and era it came from.

Bird's Eye Pine

Douglas Fir



# RECLAIMED TIMBER







Salvage wood from old buildings is primarily softwood. You'll find southern yellow pine, redwood, Douglas fir, ponderosa pine, incense cedar, oak and even bird's eye pine, to name a few. Species availability varies, because the salvage companies take whatever they can find.

In its first life, the wood may have been used for anything from flooring to shelving to structural beams. Metal detectors are used to find and remove hardware. Timber coming from flooring and shelving, commonly 4/4 to 8/4, is generally abrasive planed (sanded to thickness) and sold by the board foot in random length and width lots. Large beams may be sold as beams, or resawn to a customer's specifications.

It's a good idea to let the supplier do the abrasive planing for you. Lead-based paint was used in the United States until 1978, and having the planing done by the supplier keeps any potentially toxic waste out of your life. Once you have the wood in your shop, using standard dust control procedures should be adequate.

You might find reclaimed timber more brittle than other wood. You'll also want to keep an eye out for hardware and fasteners, even if you had the supplier do this for you. Other than that, it works like any other material you're accustomed to.



**Southern Yellow Pine**



**Ponderosa Pine**

Prices on reclaimed timber can range tremendously, from 50 cents to \$12 per board foot. Price fluctuations are caused by the logistics of salvaging the wood, its condition after salvage and supply and demand. Material selection, quantity purchased and shipping charges also affect your final cost.

Reclaimed timber marries the old to the new. It's reasonably priced and gives you the opportunity to creatively work with, not around, the wood's rich history.

**AW**

## Sources

This list is just a jumping off point. Try searching the internet, using "reclaimed timbers" as a category. Suppliers have various materials available, as well as minimum order and shipping requirements.

American Timbers Co.  
Maryland (800) 461-8660

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California (707) 629-3679

Traditional Woodworks  
Wisconsin (800) 882-2718

Trestlewood  
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**Southern Yellow Heart Pine**



# Tambour Doors

*Disappearing doors hide your clutter and show off your skill.*

Tambour doors are a bit of wood-working sleight of hand. Now you see them, now you don't. Fun to open and fun to close, tambours invite you to play with your furniture. Designing a tambour can be fun, too, because you'll have to build a full-size model of the door to work out the details.

Use tambour doors wherever regular doors are too large or too awkward. A

tambour can cover a wide opening without having to swing out like a regular door. It never gets in your way. You can open a single tambour to reach the entire contents of a cabinet, rather than open multiple standard doors. A cabinet with an open tambour has a clean, contained look, rather than the busy look of a cabinet with open doors.

Start your project by carefully design-

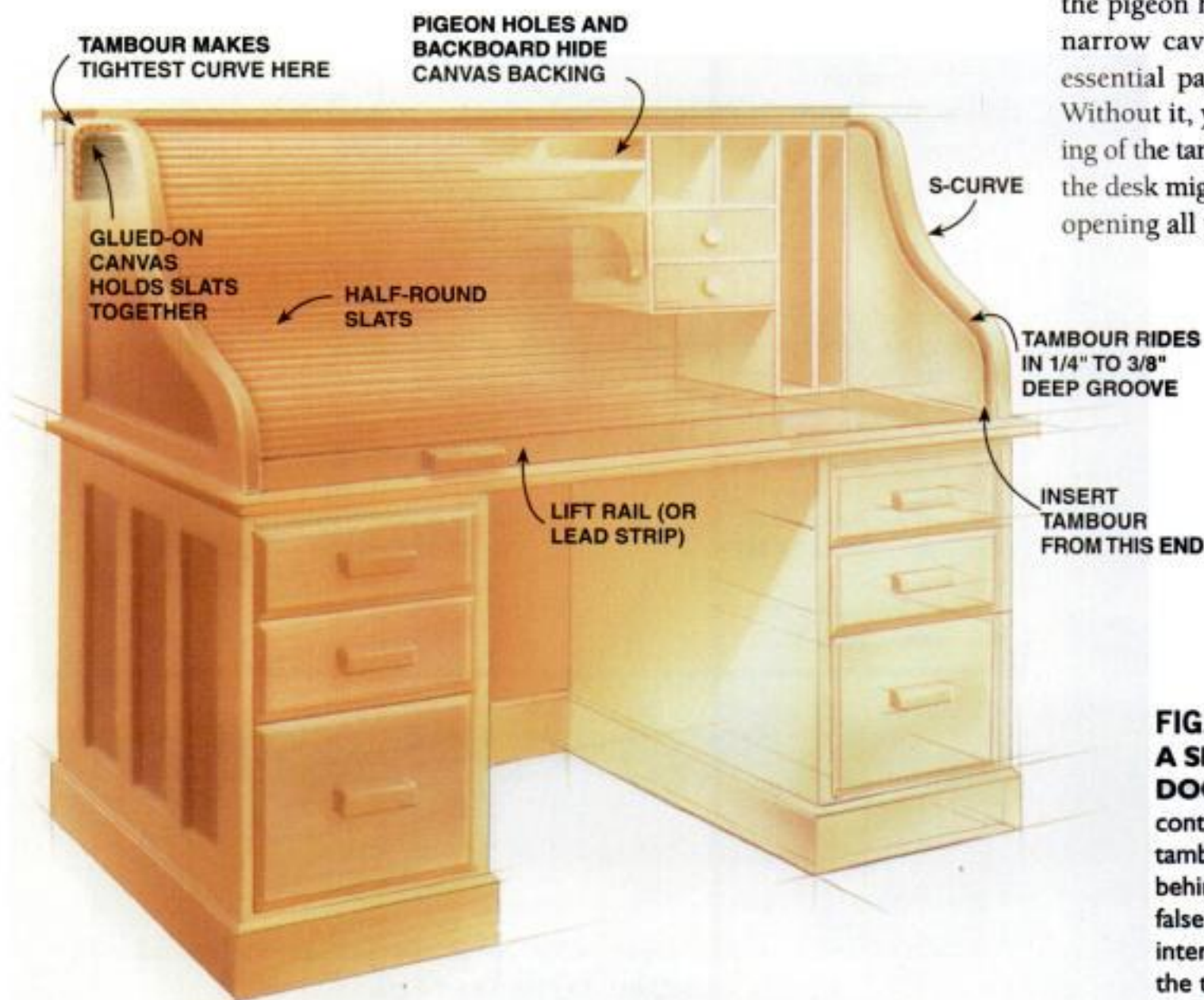
ing the doors. The shape and size of the slats will determine the diameters of the curves that the tambour will follow. Next, design a cavity to hold the tambour. This is where you play the part of a magician. Finally, draw out a case that will contain the curves and cavity. This may seem like designing furniture backwards, but you'll find this method does put the horse before the cart!

A tambour door has three parts—the slats, a canvas backing and a thicker rail or stile to pull the whole assembly. A tambour can run up and down or side to side, and pass through either an S-curve or a simple-radius C-curve. Let's look at two classic examples of how tambours have been used: a turn of the century rolltop desk and an early 19th-century Federal desk.

## An S-Curve Gives Strength

A rolltop desk with sides curved in the shape of a lazy S is a familiar icon (Fig. A). The tambour runs down behind the pigeon holes and false back into a narrow cavity. The false back is an essential part of all tambour design. Without it, you'd see the canvas backing of the tambour. Moreover, clutter on the desk might block the tambour from opening all the way.

*(continued on p. 88)*



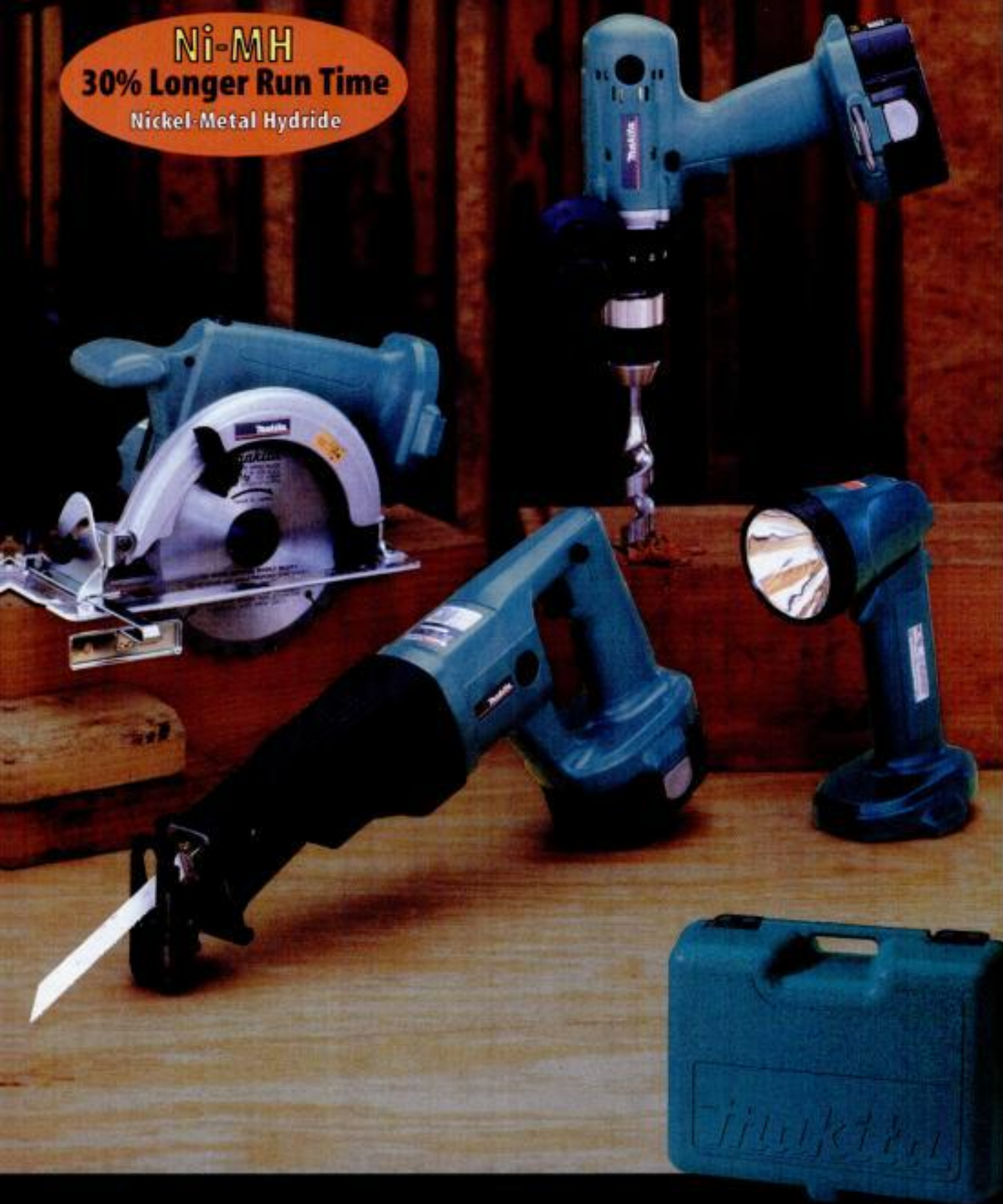
**FIG. A**  
**A SLIDING TAMBOUR DOOR** conceals the messy contents of a rolltop desk. The tambour retracts into a cavity behind the pigeon holes and false back, so the clutter can't interfere with the free travel of the tambour.



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## Practical Design

(continued from p. 86)

There's more to the S-curve design than meets the eye. Its pleasing curve has two practical benefits (Fig. B). Bending the tambour into a reverse curve actually stiffens it, which prevents the slats from drooping in the center of a wide desk. To prove this to yourself, hold up a piece of paper and form it into the shape of an S-curved tambour. Flatten out the curve and the paper will droop.

A tambour has to flex both forward and backward to pass through an S-curve. Half-round and bevel-edged slats are traditional designs that can accomplish this (Fig. C).

The slats in an S-curve tambour can be thinner and lighter in weight than those needed to stiffen a tambour that isn't curved. Yet another feature of an S-curved tambour is that it's less likely to come crashing down when you close it!

### Sizing S-Curve Slats

Design your rolltop tambour on a full-scale drawing. Use a piece of paper as large as the end of the desk to work out the shape of the S-curve, the size of the pigeon hole section and the placement of the false back.

Draw the groove parallel to the curved side. It's easiest to make its width the same size as a router bit. Then make the slats a little bit thinner than the groove so they can move freely along it.

**FIG. B**  
**THE S-CURVE DESIGN**  
has more to it than good looks. The slats won't sag if they're held in a bent shape.



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The thickness of the slats depends on the distance they have to span. Slats range from a bit less than  $\frac{3}{4}$ -in. thick for a 60-in. opening down to  $\frac{5}{16}$ -in. thick for a 24-in. opening.

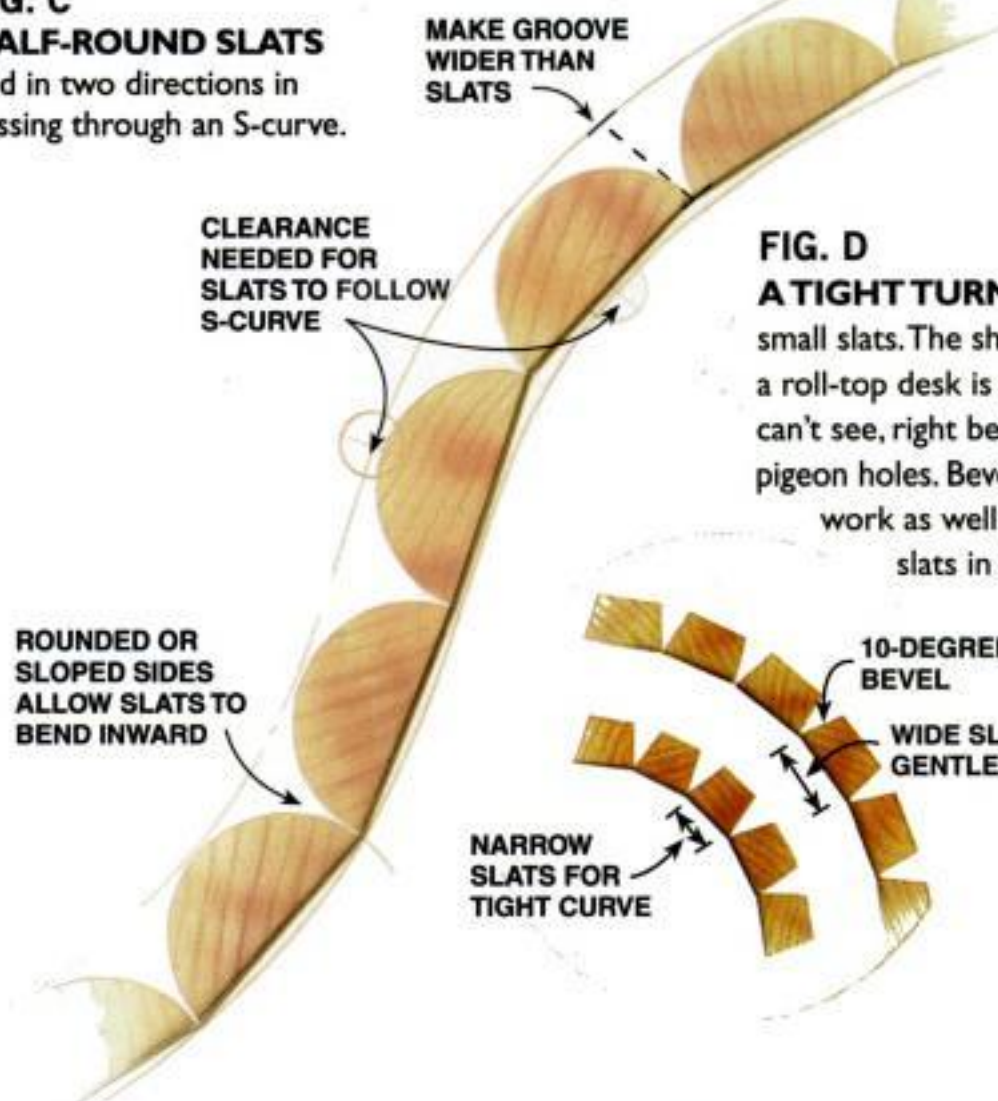
How wide should the slats be? Their width is limited by the sharpest turn the tambour has to make (Fig. D). In a roll-top, that turn is hidden. It's at the back of the desk, behind the pigeon holes.

## Build a Model

Sizing the width and thickness of the slats can't be done on paper alone, however. You have to test the real thing.

Rout a groove into a piece of plywood, following a template. Make a few short tambour slats and glue them on to a piece of canvas. Try running the mock tambour through the groove. If it's too loose, your tambour will make an unpleasant rattling sound. If it's even a shade too tight, the tambour

**FIG. C**  
**HALF-ROUND SLATS**  
fold in two directions in passing through an S-curve.



**FIG. D**  
**A TIGHT TURN** requires small slats. The sharpest turn in a roll-top desk is the one you can't see, right behind the pigeon holes. Beveled slats work as well as half-round slats in an S-curve.



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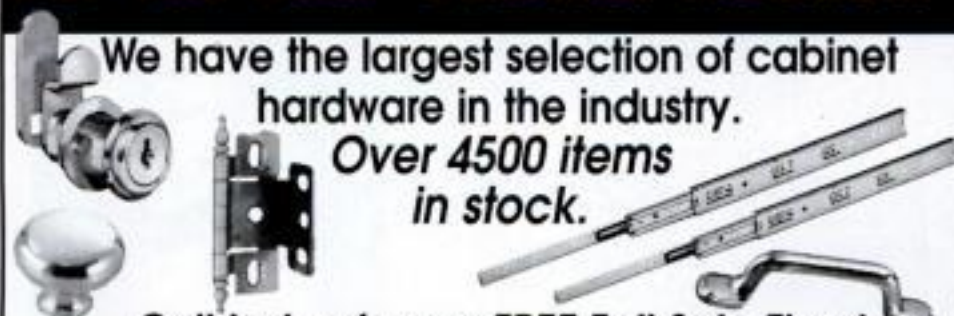
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## Practical Design

may not move in humid weather. The right fit can be elusive, but the only way to find it is to build a model.

### The Lift Rail

A large rolltop tambour needs a heavy-duty, multi-purpose lift rail. The lift rail absorbs the shock of the tambour closing on the desktop. Its extra width and thickness help the tambour glide through the grooves without buckling, give you enough room to install a mortised lock and provide a surface large enough to hold a comfortable handle.

Design the handle and buy the lock before choosing the size of your lift rail. They're generally 2- to 3-in. wide.

Cut a tongue on the ends of the rail so it can slide through the grooves (Fig. E). The tongue is thinner and wider than the slats. Try running a mock lift rail through the S-curve. It doesn't have to negotiate the tight turn

behind the pigeon holes because you can install the completed tambour from the front of the desk.

### Turning Tight C-Curves

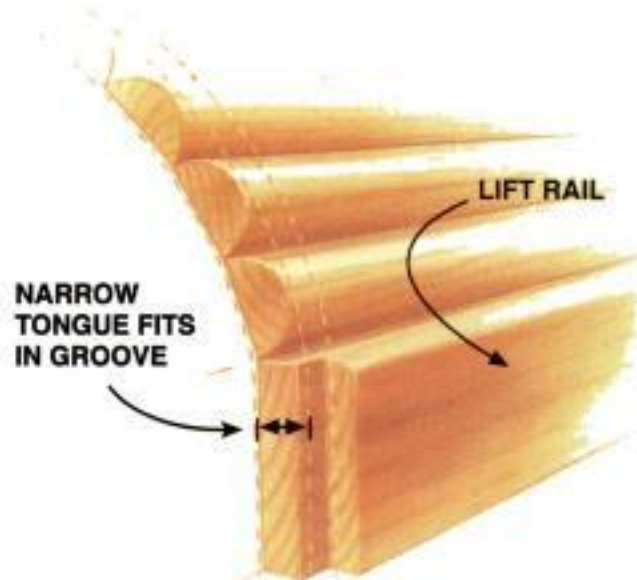
Let's turn to the Federal desk, where the tambour moves across the face of a cabinet to make two C-shaped turns at each end (Fig. F). This tambour disappears like magic into a cavity between the outer cabinet and an inner box that contains pigeon holes or shelves. Because it only bends in one direction,

the tambour can have flat faces. When closed it will look like a flat panel, unlike the ribbed surface of the rolltop desk tambour.

Often the trick here is to design a tambour that can make a very tight turn. A wide turn would require large, awkward-looking stiles at the sides of the cabinet. The secret is to put small,

FIG. E

**RABBET THE END** of the lift rail so it will pass through the S-curve groove. Size the tongue by experimenting with the mock-up S-curve and tambour. The lift rail doesn't have to pass through the tight turn at the back of the desk, however.



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BN125 18G "1/4" Brad \$87.90  
BN200P 18G Brad Nailer Kit \$122.90  
DA250AP 15G 1"-2" Finish \$209.90  
FN 250AP 16G 1"-2" Finish \$181.50  
NS150P 18G 1/4" Crown Stplr \$136.90  
FC350P Clipped Head 2"-3" Framing Nailer Kit \$287.00  
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693PK 1-1/2 HP Plunge Router Kit  
Includes 690 w/ fixed base, plunge base w/ case & edge guide \$189.90  
NEW! 691RS Router Work Shop \$309.00  
NEW! 7529P 2HP Plunge Router \$217.00  
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691 1 1/2 HP D-HOL Router \$161.50  
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6911 D-Handle Base Only \$72.00  
7539 3-1/4 HP Plunge Router-Plus Free Fine Depth Adj. (\$26.50 Value) \$294.90  
7518 3-1/4 HP 5SP FB Router \$277.00  
97310 Laminate Trim Kit \$183.00  
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698 Router Table w/out motor \$135.75  
NEW! 9543P Jig Saw w/ case \$167.90  
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9872 14.4V Cordless Drill Kit w/2 batteries, case & charger \$178.90  
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9352VS VS Belt Sander w/ case \$188.00  
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22-675Y 15" Planer with FREE 50-655 stand (a \$260.55 value) \$1058.00\*  
28-275 14" Open Band-Saw \$497.90\*  
37-190 6" Deluxe Jointer \$379.00\*  
NEW! 37-195 6" Pro Jointer \$447.90\*  
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NEW! 43-420 Platinum Edition Shaper \$1399.00\*  
31-280 Sanding Center \$728.00\*

\* Price After Delta Mail-In Rebate

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34-182 Tenoning Jig \$84.90  
11-990 5SP Drill Press \$192.00  
17-905 Mortising Attachment with case \$22.00  
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14-650XP 1/2 H.P. Hollow Chisel Mortiser including 4 standard Mortise Chisels and Bits, 1/2", 5/16", 3/8" and 1/2" \$247.90

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Includes Over \$27.00 Value Free  
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•FREE 1-Delta Alum. Blast Gates  
•FREE 2-Delta 4" Hose Clamps  
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•FREE 2-Delta Alum. Blast Gates  
•FREE 4-Delta 4" Hose Clamps  
**TOTAL PACKAGE ONLY \$298.90**

NEW! 50-820 Portable Dust Collector \$184.90  
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36-235 12" Compound Miter Saw \$299.90  
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DW744 10" Table Saw \$497.00  
DW662K Biscuit Joiner with FREE 100 Biscuits (8 value) \$157.90  
DW421 Sander \$69.95  
DW423 5" EVS R/O Sander w/H&L & Dust Collector \$82.50  
DW991KS-2 14.4V Combo Drill & Saw Kit w/case. **BONUS:** Free Dewalt Leather Holster (\$29.00 value) \$312.95  
DW354 7-1/4 Circular Saw with Brake \$149.90  
DW4K 4 Piece Fat Boy Combo Kit Includes: Recp. Saw, circ. saw, hammer drill/driver, flex flashlight, charger & case. \$529.95  
DW625 VS Electronic 3HP Plunge Router **BONUS:** Free Fine Depth Adj. (a \$25.00 value) \$275.00  
DW621 2HP VS Plunge Router **BONUS:** Free Fine Depth Adj. (a \$20.00 value) \$188.90  
DW995KS-2 18V Combo Drill & Saw Kit w/case \$359.00  
DW321K 5.8A Jig Saw Kit \$162.00  
DW972K 2 12V Cordless Drill, 2 Batteries \$174.95  
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"Jorgensen" "Pony"  
#ACC 50 Pony Clamp Fixture Style 50 \$8.85  
**STYLE "J" JORGENSEN ADJUSTABLE HANDSCREW**

| Item#    | Jaw Length Overall | Max Opening Btwn Jaws | Reach, middle Spindle to Jaw | SALE    |
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| #ACC 3/0 | 6"                 | 3"                    | 3"                           | \$9.75  |
| #ACC 2/0 | 7"                 | 3-1/2"                | 3-1/2"                       | \$10.45 |
| #ACC 0   | 8"                 | 4-1/2"                | 4"                           | \$11.68 |
| #ACC 1   | 10"                | 6"                    | 5"                           | \$13.35 |
| #ACC 2   | 12"                | 8-1/2"                | 6"                           | \$15.30 |
| #ACC 3   | 14"                | 10"                   | 7"                           | \$19.35 |

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| #ACC 7224 | 24"          | 7000 lbs.         | \$20.45 |
| #ACC 7236 | 30"          | 7000 lbs.         | \$21.95 |
| #ACC 7248 | 48"          | 7000 lbs.         | \$24.10 |
| #ACC 7260 | 60"          | 7000 lbs.         | \$25.70 |



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## Practical Design

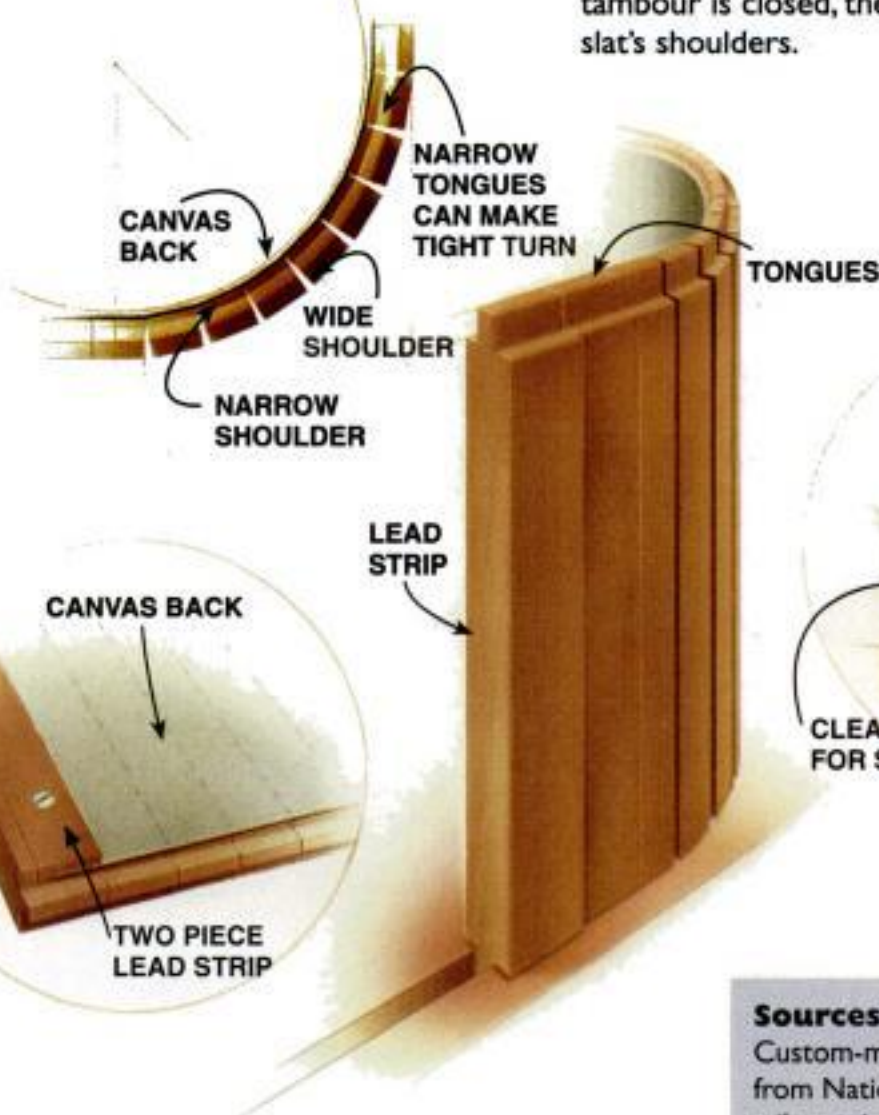
invisible tongues on all the slats (Fig. G). The smaller the slat, the smaller the tongue, and the tighter the radius the tambour can turn.

Unequal shoulders to the tongues are important for the tambour to glide smoothly through the groove. The back shoulder should be very narrow (or eliminated altogether) to bring the canvas backing in line with the curve (Fig. H).

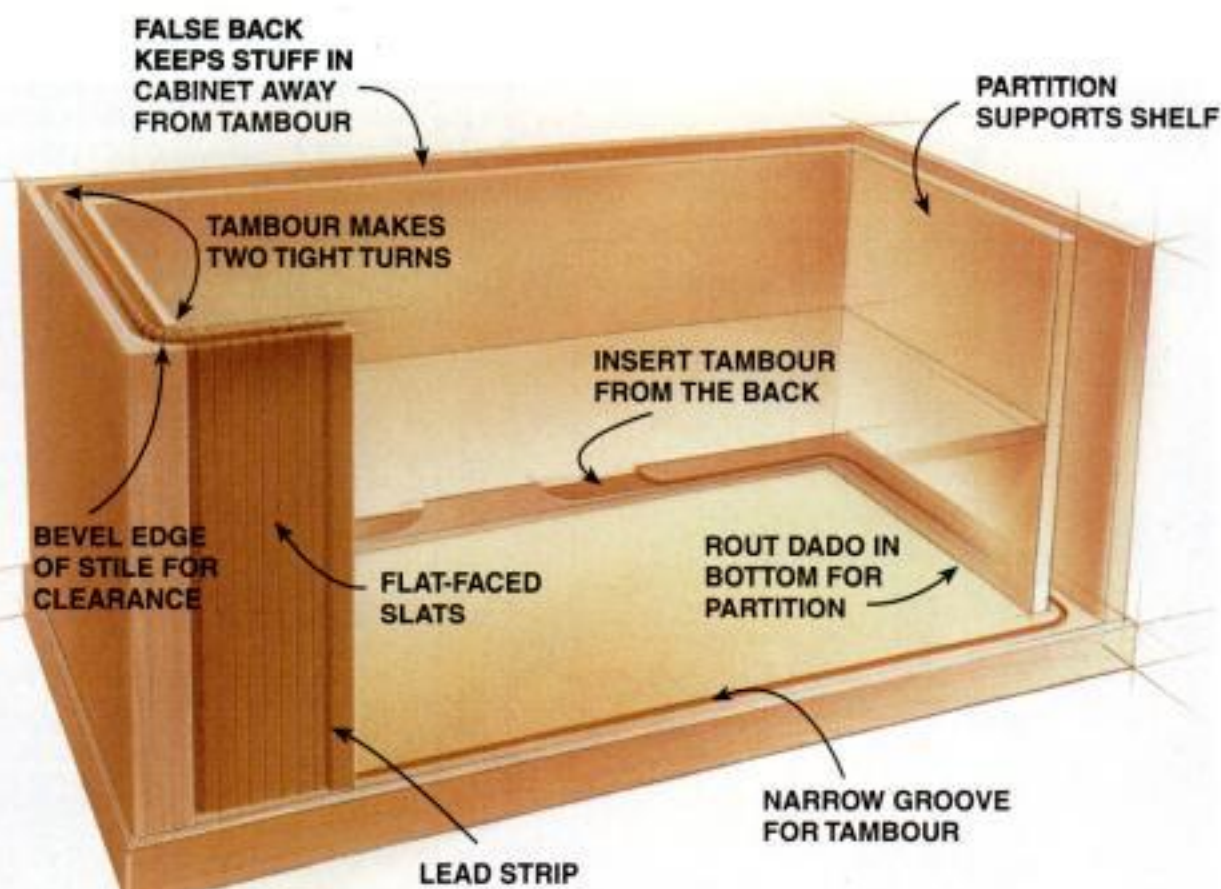
The tambour rides on the end of its tongues, not on the shoulders (Fig. J), so that opening and closing the tambour won't wear down the finish on the cabinet. Cut the tongues just a bit longer than the groove is deep.

You may dispense with a lift rail, because you're not fighting gravity. However, if you want the door to lock or need more room for a handle, you can make a lead strip that's larger than the slats (Fig. K). It doesn't have to negotiate the tight C-curves. Insert the finished tambour from the rear of the cabinet and attach a two-part lead strip to the tambour after it has passed through the turns. **AW**

**FIG. H**  
**A SMALL BACK SHOULDER** is crucial. The closer the canvas is to the groove, the less the slats will bind as they round the bend.



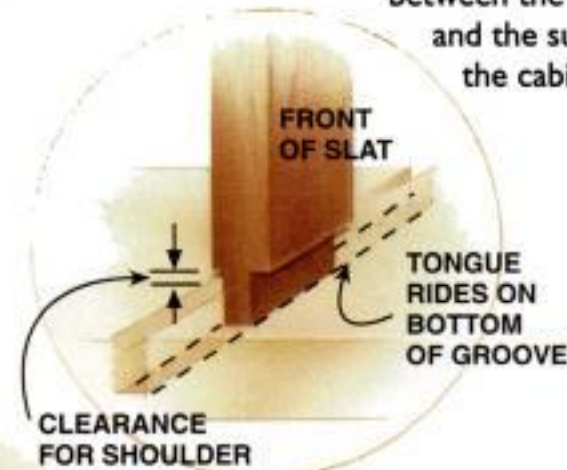
**FIG. K**  
**ATTACH THE LEAD STRIP** to a loose flap of canvas after the tambour is installed in the cabinet. Its tongue can be wide because the lead strip doesn't have to negotiate any turns.



**FIG. F**  
**C-SHAPED CURVES** are typical of a tambour with vertical slats. The slats can have flat faces because they only bend in one direction. This tambour requires a box within a box. The inner box supports a shelf, hides the canvas and prevents things stored in the cabinet from interfering with the tambour.

**FIG. G**  
**TONGUES ARE THE SECRET** that helps the tambour make tight turns at the sides of the cabinet. When the tambour is closed, the lower groove is concealed by the slat's shoulders.

**FIG. J**  
**THE SLATS RIDE ON THE TONGUES**, not the shoulders. There should be a small gap between the shoulders and the surface of the cabinet.



### Sources

Custom-made and commercial tambours are available from National Products. Call (800) 228-5276 for a distributor in your area.



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# Product Reviews

## BIG Lathe, BIG Features

Jet's new Professional Woodworking Lathe has everything you could imagine in a lathe.

■ Bowl capacity is 21-in. inboard and 36-in. outboard. Big bowls spin on a 1 1/4-in. diameter spindle that'll keep them stable. Spindle capacity is 42 in.

■ This bad boy weighs in at 950 lbs.—that's some stability! You won't see this lathe walking across the shop floor.

■ Speed control comes from a mechanical speed adjustment. You get two speed ranges; one from 0 to 1,070, the other from 0 to 3,200. It's great to be able to change speed without having to change belts on a pulley. Even better is the digital rpm readout.

■ Jet built in a 220-volt, 2-hp, 3-phase motor. No 3 phase in your shop? Forget about it. The built in inverter will change single-phase to 3-phase, so the lathe can run on either single-phase or 3-phase power.



■ Add to all this a 12-in. toolrest, two 6-in. faceplates, Morse #2 tapers in the headstock and tailstock, and the ability to index the spindle every 7.5 degrees.

What a lathe! Even better, Jet is considering increasing the inboard bowl capacity to 24 in. and the spindle length to 48 in. Other specs may change as well. Look for it in stores by January 2000 and expect to pay about \$2,500.

## Two-Sided Diamond Stone

DMT (Diamond Machining Technology) has been making diamond-surfaced bench stones for a while. Their newest is Duo-Sharp, a double-sided diamond stone.

You can get the stones in four grit combinations: extra-fine (1,200 mesh/9 micron)/fine (600 mesh/25 micron); extra-fine/coarse (325 mesh/45 micron); fine/coarse; and coarse/extra-coarse (220 mesh/60 micron). According to DMT, the extra-fine stone is about the grit equivalent of a fine

Japanese waterstone. Extra-coarse is like a medium India stone.

One of the things I've always liked about diamond stones is ease of use. They stay flat, use water for lubrication and you can put diamond up against even the toughest things you need to sharpen, like carbide.

Buy the stones in 2 3/8 in. x 8 in. (\$114) or 4 in. x 10 in. (\$155) sizes. Each includes a molded base with non-skid rubber feet. You'll pay slightly less if you buy the stones without the base.

Call DMT at (508) 481-5944.





# Lee Valley & Veritas®



**These products are just a sampling of gift ideas from our full-color, 248-page catalog.**

## A. Tape-in-a-Can by Veritas®

In many uses, a rule is preferred to a tape measure, but rules are awkward to carry. The very earliest designs of pocket tape measures were flexible metal rules coiled inside containers, not attached to them. This was particularly useful for shorter rules (6' or under), since it allowed people to carry them around in a pocket, uncoiling the rule only when being used and avoiding the nuisance of an attached case.

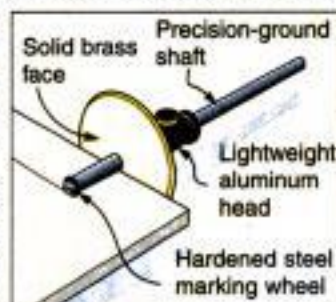
We incorporated these features in our Tape-in-a-Can line. Our case is a compact 1 3/4" dia. by 3/4" thick, made of glass-filled nylon for durability and lightness. It has a free-wheeling inside drum controlled by a spring-loaded brake button. The tape easily slides out of the can, powered by its own coil strength, and easily inserts by reversing the process. The tapes are 1/2" wide and have Imperial graduations on the convex side and metric graduations on the concave face. The 3' tape is a "yardstick-in-a-can", far easier to store and use than a wooden yardstick. The 6' is for those who are big-scale thinkers.

Inexpensive and accurate, these are handy to use where you don't want to deal with an attached case. Case made in Canada.

AW0201 3' Tape-in-a-Can \$4.95  
AW0202 6' Tape-in-a-Can \$6.50

## B. Veritas® Wheel Marking Gauge

Avoid the shortcomings of standard pin marking gauges. Our marking gauge will perfectly scribe at any point of its circumference. Since the hardened steel wheel is sharp, bevelled only on the inside and non-rotating, it cuts through grain and forces the gauge face against the stock, maintaining accuracy. It cuts rather than tears and leaves a clean mark, even on cross grain. The gauge is easy to set since it has an internal O-ring to keep light but constant friction on the stem. The anodized aluminum head has a 1/8" thick brass face and a brass thumbscrew.



AW0210 Wheel Marking Gauge \$18.95

## C. Veritas® Sliding Bevel

We got the germ of the idea for the cam locking mechanism on this sliding bevel from a model made in the early 1900s. We improved it substantially, making a better mechanism of bronze (using the lost-wax process), combining it with a 10" stainless-steel blade and housing both in a resin-impregnated wood body; it could be used under water without damage. The obvious benefit of this design is that the locking mechanism is completely

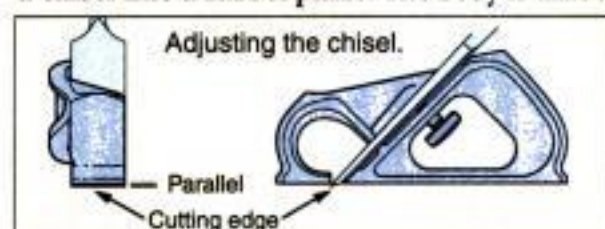


flush, allowing the bevel to be used on either side. But more important, it can be used in the most restricted places since the lever cam lock can be operated with a single finger. You can reach way back into a corner to measure angles. Since the locking mechanism operates by compression with no rotary movement, accuracy is perfect. This is the best sliding bevel design on the market.

AW0265 10" Sliding Bevel \$21.95

## D. Veritas® Chisel Plane

Rabbet planes used to be widely available, but are now being discontinued by manufacturers. We developed this specialized plane to convert a chisel into a rabbet plane. The body is made



of cast ductile iron and is configured to hold a 1" bevel-edge chisel at a 45° angle, the same pitch as used on bench planes. It becomes a small plane that works equally well as a shoulder plane or rabbet plane and can be used to clean up machine-cut rabbets and tenons. It works like a butt mortise plane for cutting hinge gains. It will also cut 1" dados and grooves up to a depth of 3/8". Precisely machined. Overall size is 1 3/8" wide by 5 1/2" long by 2 1/2" high. The clamping screw is solid brass. While it excels as a job-site plane, it is equally handy in the shop. Chisel not included.

AW0100 Veritas® Chisel Plane \$29.95

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## Product Reviews

# One Sweet Router

After using this router I had a hard time deciding which feature I liked the best. It's got a 2-hp motor, so there's plenty of power. Add to that soft start, great dust collection, variable speed and a well made micro-depth adjust. But in the end, it was the electronic brake I really fell in love with. Take a look at what this tool's got:

■ A 1-in. dust port is built into the base. An acrylic shield on the base centralizes dust pick up right at the bit. However, if you run bits bigger than 1 1/8-in. dia., the shield has to come out. Simply remove three screws, and out it comes. No big deal. I routed a lot of MDF with this router and the dust pick up was excellent.

■ When you do run those bigger bits, you need to slow down the rpms. Variable speed on this router runs from 10,000 to 23,000 rpm. That's slow enough at the low end for panel raising bits and high enough for smaller straight and profile bits.

■ There are two switches on this router. A toggle on top of the motor and a trigger on the handle. If you put the router in a table, you can lock the spring-loaded trigger in the On position, and control the router with the toggle switch on the motor. A trigger on the handle,

especially on a plunge router, is the way to go.

■ After routing, you need to stop. This is where the electronic brake comes in. Shut off the power, and the spindle stops INSTANTLY! No more free wheeling router bits.

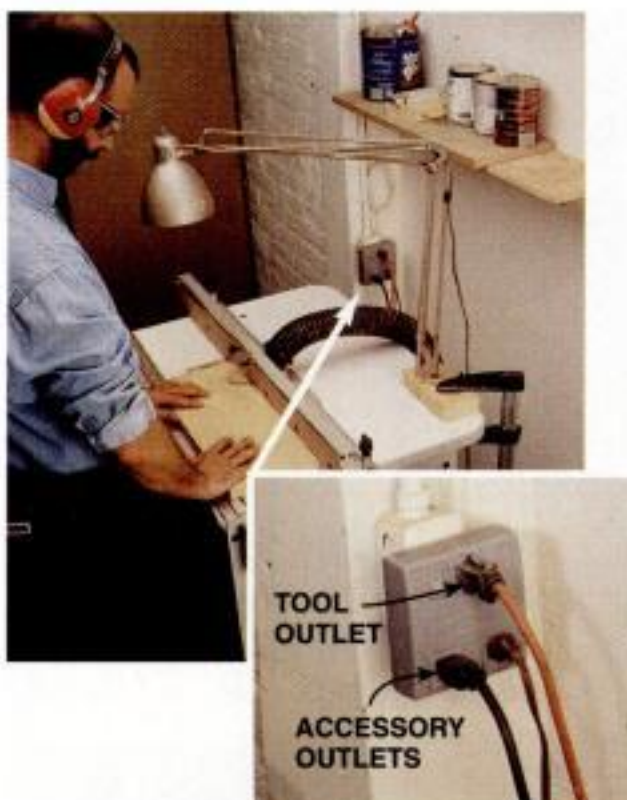
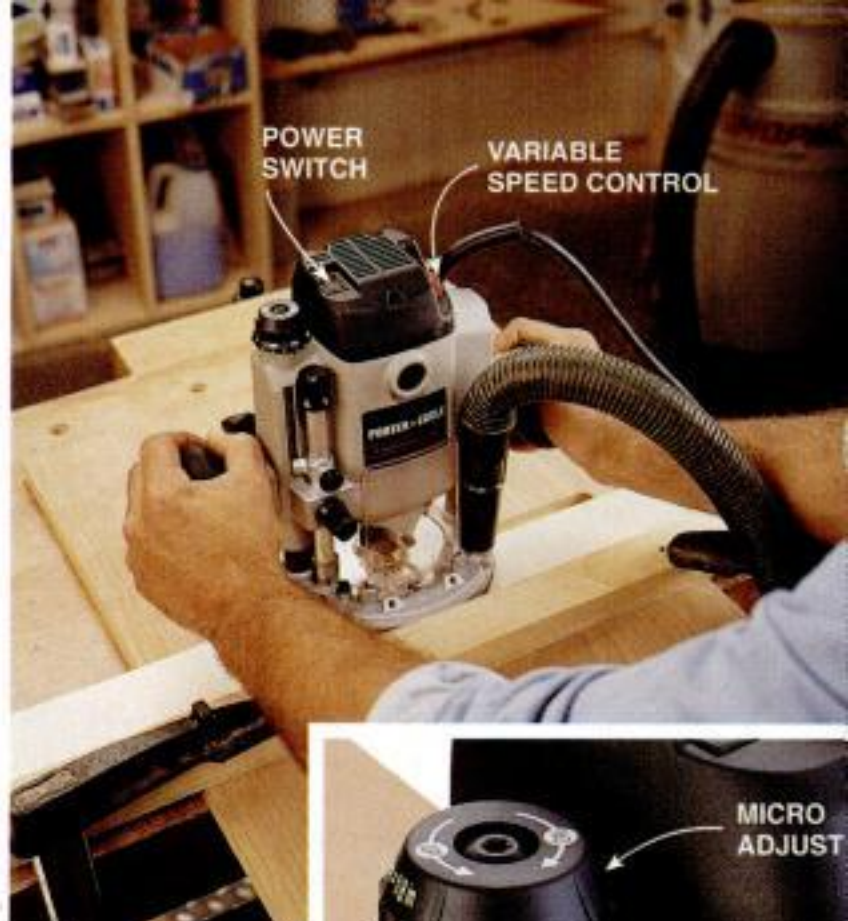
■ One full turn of the micro adjust moves the motor a mere 1/8 in. This makes it very easy to dial in those tiny increments to get just the right cut.

■ Porter Cable includes 1/4-in. and 1/2-in. collets. They finally got away from a two wrench system and included a spindle lock. You can hold the spindle lock with one hand and loosen or tighten with the wrench in the other hand. Works fine. The collets are self-releasing and this presents a small problem. The threading on the spindle is very short. By the time you loosen the collet enough to engage the self-release collar, the collet is off the spindle. Every time I loosened a collet, it came off in my hands. Not a deal breaker, just a little irritating.

■ Like all plunge routers, the 7529 has a turret so you can set depth of cut for various applications.

This is a problem-solving tool. If routers in the 1 1/2-hp range are too small for your needs, and the 3-hp beasts are too much to handle, this router's for you!

Price: \$190 from Porter Cable retailers.



## Craftsman's Automatic Power Switch

Flip on the light, switch on the shop vacuum, power up the power tool. Wouldn't it be great to do all this with the flip of one switch?

Try Craftsman's Automatic Power Switch. Plug the switch into a 110/120 outlet, then plug your tool, and up to two accessories, into the switch. When you turn on the tool the accessories come on automatically. Shut off the tool and the accessories stay on for about three seconds more. You can also set the manual

override switch so the accessories don't come on with the tool.

The switch is rated at 15 amps, and I questioned its ability to handle a load. Then I ran a 75-watt light, 6.5 amp vacuum and 15-amp router with no problems. Use this switch with your jointer, bandsaw, router—anyplace you need a light and/or vacuum to run along with the tool. At \$20 the price will turn you on too. Get it at your nearest Sears store.

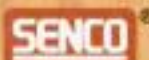


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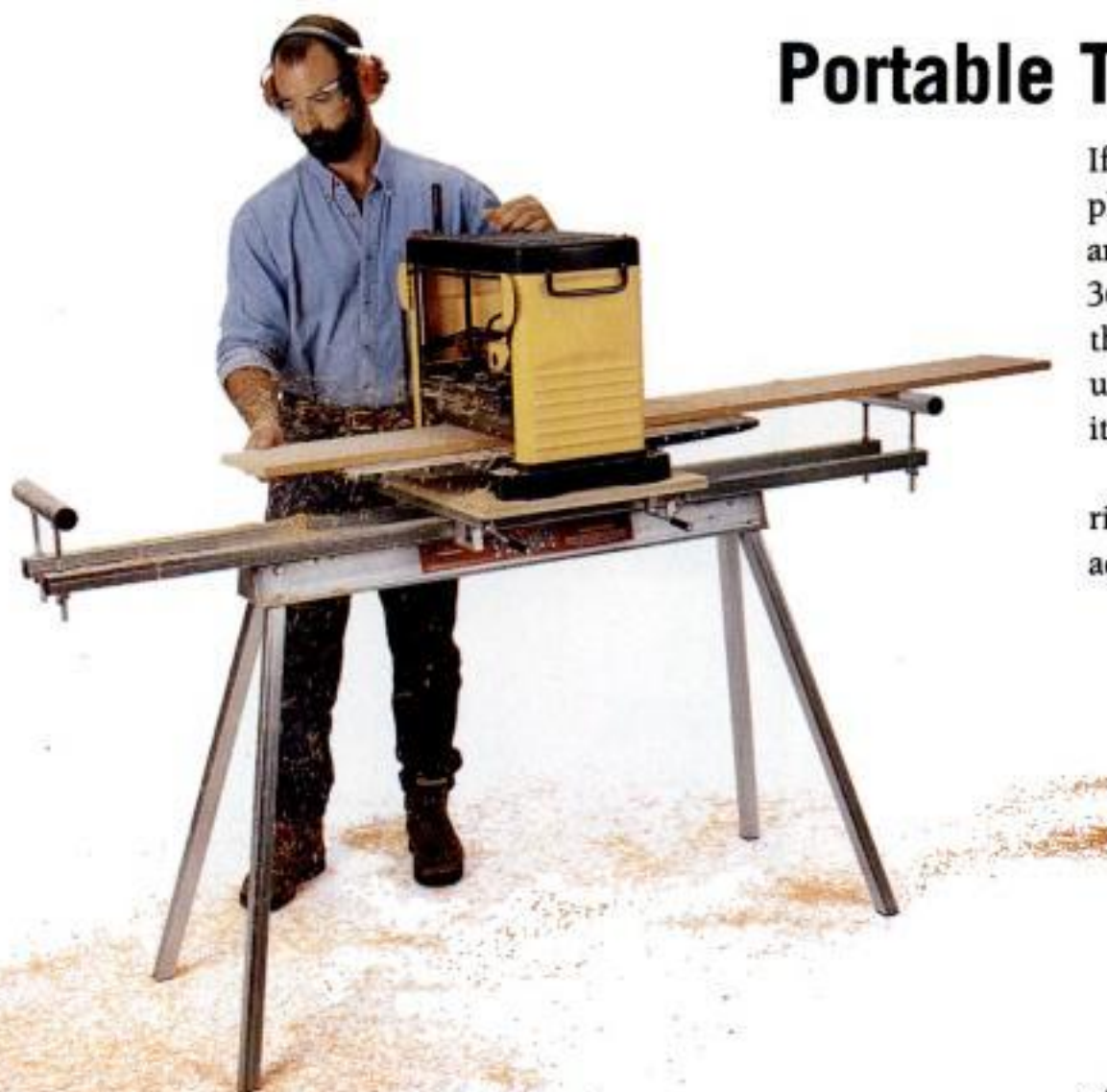
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## Portable Tool Stand



If you need a place to set up your benchtop planer, as well as a great stand for a miter saw or any other benchtop tool, try the Stablemate RWC-36 from Iowa Manufacturing. It's a sawhorse with the rigidity of a workbench. When you're not using it, remove the tool, fold the locking legs and it's a snap to put everything away.

The stand is 36-in. high and comes with material supports that are about 71-in. apart. You can adjust the supports to the height you need, plus it's easy to get tools on and off. Just fasten your benchtop tool to the mounting clamps.

Carriage bolts are included for this. The mounting clamps have dovetail-shaped jaws that grab onto the top of the Stablemate. A couple turns of the handles, and everything is locked in place.

Most miter saws can be bolted directly to the mounting clamps. Planers, because their mounting holes are farther apart, will probably have to be fastened to a piece of plywood first.

There's a little wiggle to the system with a planer on it, but not much. Overall, I found the set up very stable—hence the name! The portability is excellent. The Stablemate is perfect for woodworkers with limited space, or if your tools need to travel.

You can get the Stablemate for about \$120. If you want extra mounting clamps, a set for each tool, they're only around \$30. Iowa Manufacturing; (800) 882-4422.

## Easy Edging Clamps

Gluing on edging has never been so easy as with Pony's Edging Spring Clamp. These babies grab the surface, the same as any spring clamp. The difference is that a piece of spring steel inside the jaws applies pressure to a piece of edging at the same time.

The clamp pressure was more than adequate and the clamps were very easy to use. A clamp about every 10 in. pulled oak edging tight.

Pick up 1- and 2-in. clamps for \$4 and \$5 respectively. Available at many home centers or call Adjustable Clamp Co., (312) 666-0640.





| Model  | Description                                  | List | Sale |
|--------|----------------------------------------------|------|------|
| 31-750 | New Bench Random Orbit Sander                | 199  | 155  |
| 28-150 | NEW 9' Bench Band Saw                        | 155  | 155  |
| 50-860 | 850 CFM Air Cleaner                          | 239  | 239  |
| 31-695 | 6" Belt/9" Disc Sander                       | 441  | 299  |
| 23-710 | Sharpening Center                            | 217  | 155  |
| 31-460 | 4" Belt/Disc Sander                          | 198  | 119  |
| 40-560 | 16" 2 speed Scroll Saw                       | 230  | 129  |
| 40-540 | 16" var/spd Scroll Saw                       | 249  | 159  |
| 11-990 | 12" Bench Drill Press                        | 255  | 184  |
| 11-090 | 32" Radial Bench Drill Press                 | 405  | 279  |
| 43-505 | 12" Bench Router/Shaper                      | 398  | 299  |
| 22-540 | 12" Bench Top Planer                         | 329  | 259  |
| 22-560 | 12-1/2" Planer w/ extra knives               | 329  | 259  |
| 36-865 | Versa Feeder Stock Feeder                    | 249  | 249  |
| 36-220 | 10" Compound Miter Saw                       | 294  | 199  |
| 37-070 | 6" var/spd Bench Jointer                     | 351  | 265  |
| 14-650 | Hollow Chisel Mortiser with chisels and bits | 390  | 249  |
| 17-900 | 16-1/2" Floor Drill Press                    | 490  | 329  |
| 17-920 | Mortise Chisel Kit                           | 52   | 65   |
| 36-285 | 8-1/4" Builders Saw w/ stand                 | 275  | 215  |
| 34-555 | Sliding Table                                | 487  | 315  |
| 36-250 | 10" Slide Compound Saw                       | 825  | 455  |
| 31-780 | Oscillating Spindle Sander                   | 253  | 194  |
| 46-700 | 12" Wood Lathe                               | 575  | 479  |
| 40-650 | Q3 18" Scroll Saw                            | 389  | 389  |
| 36-905 | 30" Unifence                                 | 345  | 259  |
| 36-906 | 50" Unifence                                 | 444  | 319  |
| 36-444 | 10" Contractors Table Saw                    | 581  | 529  |
| 33-830 | 10" Radial Arm Saw                           | 851  | 729  |
| 37-285 | NEW 6" Jointer w/ stand                      | 424  | 345  |
| 37-380 | NEW 8" Professional Jointer                  | 1500 | 1129 |
| 50-850 | 1-1/2 HP, 1200 CFM                           | 295  | 295  |
| 50-851 | 2 HP, 1500 CFM                               | 395  | 495  |

The following tools have a \$50.00 rebate!  
Price shown is before rebate.

|        |                                                                                                         |      |      |
|--------|---------------------------------------------------------------------------------------------------------|------|------|
| 36-475 | 10" Platinum Edition Contractors Table Saw w/ 30" unifence, cast iron wing, table board & carbide blade | 849  | 799  |
| 22-675 | DC380 15" Planer                                                                                        | 1175 | 1175 |
| 28-275 | 14" Band Saw 3/4 HP                                                                                     | 595  | 595  |
| 28-280 | 14" Band Saw 1 HP motor with enclosed stand                                                             | 739  | 739  |
| 28-255 | 14" Platinum Edition Band Saw - 1 HP w/ mobile base, 18" rip fence, & 3/8" blade                        | 849  | 849  |
| 31-280 | Sanding Center w/ stand                                                                                 | 789  | 789  |
| 37-190 | 6" Deluxe Jointer                                                                                       | 603  | 445  |
| 37-195 | 6" Professional Jointer                                                                                 | 625  | 539  |

| Model       | Description                       | List | Sale |
|-------------|-----------------------------------|------|------|
| 6527-6      | Sawzall with case                 | 343  | 169  |
| 6537-226527 | w/quick lok blade change          | 224  | 179  |
| 0407-2212V  | Drill w/keys chuck&2 batt         | 380  | 179  |
| 0224-1      | 3/8" Drill 4.5 amp magnum         | 236  | 135  |
| 0234-6      | 1/2" Drill 4.5A mag 0-850 rpm     | 255  | 134  |
| 0235-6      | 1/2" Drill w/keyless chuck        | 255  | 139  |
| 0244-1      | 1/2" Drill 4.5A mag 0-600 rpm     | 255  | 139  |
| 0222-1      | 3/8" Drill 3.5 amp 0-1000 rpm     | 213  | 128  |
| 0228-6      | 3/8" Drill 3.5 amp 0-1000 rpm     | 207  | 124  |
| 0375-6      | 3/8" close quarter Drill          | 255  | 148  |
| 0379-1      | 1/2" close quarter Drill          | 288  | 168  |
| 6546-6      | Screwdriver 200 & 400 rpm         | 150  | 89   |
| 6547-6      | 6546-6 w/bits, 1/4" chuck & cs185 | 112  | 125  |
| 5399        | 1/2" D-handle Hammer Drill Kit    | 356  | 225  |
| 5397-6      | 3/8" w/ spd Hammer Drill Kit      | 275  | 145  |
| 5371-6      | 1/2" w/ spd Hammer Drill Kit      | 360  | 194  |
| 6145        | 4-1/2" Grinder 10,000 rpm         | 179  | 105  |
| 6494-6      | 10" Compound Miter Saw            | 585  | 279  |
| 6266-6      | Top Handle Jig Saw                | 315  | 159  |

| Item     | Description                  | Teeth | List | Sale |
|----------|------------------------------|-------|------|------|
| LUT2M010 | Gen Pur. A.T.B. 10" 40       | 69    | 42   |      |
| LUB2M010 | Cut-off 10"                  | 60    | 33   | 32   |
| LUB4M011 | Comb 10"                     | 50    | 78   | 45   |
| LUB5R010 | Super Cut-off 10"            | 80    | 114  | 68   |
| LM72M010 | Ripping 10"                  | 24    | 69   | 39   |
| LM73M010 | Cut off 10"                  | 60    | 84   | 49   |
| LU87R010 | Thin Kerf 10"                | 24    | 72   | 48   |
| LU88R010 | Thin Kerf 10"                | 60    | 88   | 55   |
| LU96R010 | Ultimate 10"                 | 80    | 128  | 78   |
| LU91M010 | Compound Miter 10"           | 60    | 88   | 54   |
| F410     | Quiet Blade 10"              | 40    | 55   | 54   |
| SD308    | 8" Dado - Carbide            | 230   | 119  |      |
| SD508    | 8" carbide w/case & shims    | 344   | 172  |      |
| FB100    | 16 piece Forstner Bit Set    | 338   | 194  |      |
| 94-100   | 5 pc. Router Bit Door System | 320   | 169  |      |
| FT2000E  | Plunge Router                | 382   | 185  |      |

| Model  | Description                           | List | Sale |
|--------|---------------------------------------|------|------|
| C8FB2  | 8-1/2" Slide Compound Saw             | 1169 | 449  |
| C10FS  | 10" Slide Compound Saw                | 1627 | 579  |
| C15FB  | 15" Miter Saw                         | 1346 | 645  |
| C10FCD | NEW 10" dual bevel Compound Miter Saw | 550  | 265  |
| NV45AB | Coil Roofing Nailer                   | 935  | 379  |
| NT50AE | New Pinner 3/4" - 2"                  | 351  | 119  |

| Model   | Description               | List | Sale |
|---------|---------------------------|------|------|
| 5090DW  | 3-3/8" Saw Kit 9.6 volt   | 280  | 139  |
| DA391D  | 3/8" angle Drill Kit 9.6V | 166  | 95   |
| DA391DW | 3/8" angle Drill Kit 9.6V | 341  | 139  |

| Model    | Description               | List | Sale |
|----------|---------------------------|------|------|
| 6095DWE9 | 6 volt Drill Kit w/2 batt | 125  | 125  |
| 6095DWE2 | 6095DWE w/flashlight      | 139  | 139  |
| 632007-4 | 9.6 volt Battery          | 47   | 30   |
| 632002-4 | 7.2 volt Battery          | 39   | 28   |

| Model         | Description                       | List | Sale |
|---------------|-----------------------------------|------|------|
| 9900B         | 3"x21" Belt Sander w/bag          | 347  | 165  |
| 9924DB        | 3"x24" Belt Sander w/bag          | 360  | 169  |
| N1900B        | 3-1/4" Planer with case           | 263  | 142  |
| 1912B         | 4-3/8" Planer                     | 352  | 205  |
| N9514B        | 4" Disc Grinder 4.6 amp           | 118  | 65   |
| DA3000R3/8"   | Angle Drill                       | 355  | 185  |
| 2708W         | 9-1/4" Table Saw                  | 637  | 295  |
| 6405          | 3/8" Drill Rev. 0-2100 rpm        | 115  | 65   |
| 6013BR        | 1/2" Drill Rev. 6 amp             | 270  | 149  |
| 9401          | 4" x 24" Belt Sander w/bag        | 458  | 219  |
| 5007NBK7-1/4" | Circ Saw w/ case                  | 250  | 125  |
| LS1011        | 10" Slide Compound Saw            | 995  | 429  |
| LS1211        | 12" Slide Compound Saw            | 1620 | 695  |
| 3901          | Plate Joiner Kit                  | 376  | 159  |
| 3612C         | 3 HP Plunge Router                | 492  | 265  |
| LS1040        | 10" Compound Miter Saw            | 460  | 259  |
| LS1013        | 10" Dual Compound Slide Miter Saw | 1088 | 599  |
| BO5010        | 5" Random Orbit Sander            | 142  | 69   |
| LS1220        | 12" Compound Miter Saw            | 376  | 195  |
| 9227C         | 7/8" Polisher                     | 350  | 165  |
| SAJ01         | 16" Bench Scroll Saw              | 300  | 175  |
| 2702          | 8-1/4" Table Saw                  | 299  | 299  |
| 2703          | 10" Table Saw                     | 309  | 309  |

| Model    | Description                                      | List | Sale |
|----------|--------------------------------------------------|------|------|
| N805-1   | Stick Nailer                                     | 295  | 295  |
| RN45     | Coil Roof Nailer 3/4" - 1-3/4"                   | 845  | 339  |
| N60FN-2K | Finishing Nailer w/ case                         | 557  | 269  |
| BT35-2K  | Brad Tacker 5/8" - 1-3/8" with case, oil & brads | 279  | 125  |
| M11FS    | Flooring Stapler 15 gauge                        | 902  | 539  |
| S325X-1K | Finish Stapler 1-1/2" - 1-3/8" with case & oil   | 269  | 135  |

| Model | Description     | List  | Sale |
|-------|-----------------|-------|------|
| 50    | 3/4" Black Pipe | 15.45 | 8.50 |
| 52    | 1/2" Black Pipe | 12.65 | 6.95 |

| Model | Description     | List  | Sale |
|-------|-----------------|-------|------|
| 50    | 3/4" Black Pipe | 15.45 | 8.50 |
| 52    | 1/2" Black Pipe | 12.65 | 6.95 |

| Model       | Description     | List | Sale |
|-------------|-----------------|------|------|
| B-50        | 50' Commer. Saw | 443  | 325  |
| T-SQUARE 52 | 52" Homeshop    | 360  | 275  |
| T-SQUARE 40 | 40" Homeshop    | 335  | 255  |
| T-SQUARE 28 | 28" Homeshop    | 325  | 245  |

| Model  | Description                      | List | Sale |
|--------|----------------------------------|------|------|
| 02415K | Brad Nailer 3/8" - 1-9/16"       | 180  | 98   |
| 0626SK | 1/4" Crown Stapler 3/8" - 1-1/4" | 89   | 89   |

| Model | Description                                                                        | List  | Sale  |
|-------|------------------------------------------------------------------------------------|-------|-------|
| 25010 | 10" die cast Torpedo Level                                                         | 21.95 | 21.95 |
| 24640 | 24" Level w/ hand holes                                                            | 47.95 | 47.95 |
| 24670 | 48" Level w/ hand holes                                                            | 54    | 59    |
| 24632 | NEW "Jambor Set" designed for setting door jambs. Includes 78" level and 32" level |       | 129   |

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| Model         | Description                                   | List | Sale |
|---------------|-----------------------------------------------|------|------|
| DW124K        | 1/2" right angle Drill                        | 590  | 329  |
| DW321K        | Top Handle Jigsaw Kit                         | 300  | 164  |
| DW364         | 7-1/4" Circ. Saw w/broke                      | 294  | 155  |
| DW610         | 1-1/2 HP 2 handle Router                      | 266  | 149  |
| DW411K1/4     | sheet Palm Sander w/ case                     | 88   | 58   |
| DW682KB       | Biscuit Joiner with case                      | 448  | 169  |
| DW705         | 12" Compound Miter Saw                        | 734  | 339  |
| DW621         | 2 HP Plunge Router                            | 400  | 199  |
| DW677K        | 3-1/4" Planer with case                       | 268  | 155  |
| DW431         | 3 x 21" w/spd Belt Sander                     | 338  | 185  |
| DW421         | 5" Palm Ran. Orb Sander                       | 144  | 75   |
| DW423         | Palmgrip Random Orbit Sander - variable speed | 170  | 92   |
| DW421 & DW423 | come with Free DW4317 case!                   |      |      |
| DW272         | Drywall Gun, 0-4000, 6.3 amp/160              | 95   | 95   |
| DW276         | Drywall Gun, 0-2500, 6.5 amp/160              | 99   | 99   |

| Model                                          | Description                                         | List | Sale |
|------------------------------------------------|-----------------------------------------------------|------|------|
| DW972K-2                                       | 3/8" variable speed w/ two 12V XR batteries         | 362  | 184  |
| DW991K-2                                       | 3/8" variable speed w/ two 14.4V XR batteries       | 415  | 209  |
| Above drill kits come w/ charger & steel case! |                                                     |      |      |
| DW991K3-2                                      | DW991K drill, DW935 trim saw, 2 XR batteries & case | 345  | 345  |
| DW911                                          | NEW jobsite Radio & Charger                         |      | 149  |

| Model     | Description                                          | List | Sale |
|-----------|------------------------------------------------------|------|------|
| DW933K    | Jigsaw Kit                                           | 468  | 275  |
| DW938K    | Recipro Saw Kit                                      | 520  | 269  |
| DW955K-2  | 1/2" Drill Kit w/ 2 batt.                            | 258  | 259  |
| DW977K-2  | 1/2" Drill/Hammer Drill Kit                          | 454  | 249  |
| DW936K    | 5-3/8" Saw Kit                                       | 458  | 249  |
| DW995K3-2 | DW995K Drill, DW938 Saw and case                     | 399  | 399  |
| DW995K3-2 | DW995K 18V drill kit, DW938 18V reciproc saw, & case | 399  | 399  |

| Model | Description                | List | Sale |
|-------|----------------------------|------|------|
| DW706 | 12" Slide Miter Saw        | 546  | 649  |
| DW788 | 20" Scroll Saw             | 549  | 469  |
| DW733 | 12" Planer w/ extra blades | 549  | 499  |
| DW744 | 10" Portable Table Saw     | 549  | 499  |
| DW756 | 6" Bench Grinder           | 164  | 75   |
| DW758 | 8" Bench Grinder           | 184  | 115  |

| Model     | Description                     | List | Sale |
|-----------|---------------------------------|------|------|
| LP6-20A   | Sight Level package-20x         | 329  | 239  |
| LP6-20XLA | LP6-20A with 9056 tripod        | 409  | 279  |
| L78-300   | Level Transit - 26x             | 739  | 539  |
| L78-300P  | above Level with optical plumb  | 869  | 629  |
| L76-900   | Level Transit - 20x             | 419  | 299  |
| LTP6-900  | Above Level with tripod and rod | 615  | 395  |
| ALTP6-900 | Automatic Level - Transit - 18x | 666  | 479  |
| ALTP6-900 | above Level with tripod & rod   | 799  | 549  |
| AL8-225   | Automatic Level - 22x           | 583  | 289  |
| ALP8-22   | Above level with tripod & rod   | 583  | 349  |
| AL8-265   | Automatic Level - 26x           | 854  | 325  |
| ALP8-26   | Above level with tripod & rod   |      | 389  |

| Model    | Description                                        | List | Sale |
|----------|----------------------------------------------------|------|------|
| 1587VS   | Top Handle "CLIC" Jig Saw                          | 292  | 139  |
| 1587AVSC | 1587VS Saw Kit with case and New Progressor blades |      | 155  |

| Model                     | Description           | List | Sale |
|---------------------------|-----------------------|------|------|
| 1584VS                    | Barrel "CLIC" Jig Saw | 288  | 155  |
| Bosch Metal Case          | for above Jig Saws    | 24   | 24   |
| Bosch 30 blade assortment | for Jig Saws          | 299  | 299  |

| Model             | Description                            | List | Sale |
|-------------------|----------------------------------------|------|------|
| 1295DH5           | 5" Random Orb Palm Sndr                | 145  | 89   |
| 1274DV5           | 3"x21" w/spd Belt Sander               | 301  | 175  |
| 1278VSK1-1/2"x12" | Belt Sander                            | 218  | 129  |
| 1275DV5           | 3"x24" v/s Belt Sndr                   | 379  | 219  |
| 1276DV5           | 4"x24" v/s Belt Sndr                   | 406  | 229  |
| 1194VSRK          | 1/2" w/ spd Drill w/ case              | 303  | 159  |
| 1613VSR           | 2HP v/s Plunge Router                  | 369  | 199  |
| 1634VSR           | Recip Saw 10.5 amp                     | 335  | 185  |
| 3318K             | 12V T-handle Drill Kit                 | 345  | 159  |
| 3615K             | 14.4V Drill Kit                        | 354  | 174  |
| 3107DV5K          | 5" Random Orbit Sander                 | 165  | 98   |
| 3107DV5K          | 3107DV5 with case                      | 195  | 118  |
| 3275DV5           | 5" Random Orbit Sander                 | 256  | 145  |
| 3277DV5           | 6" Random Orbit Sander                 | 266  | 149  |
| 3915              | 10" Slide Compound Saw                 | 1050 | 499  |
| 3912              | NEW 12" Cmpnd Miter Saw                | 638  | 329  |
| 11224VSR          | 7/8" SDS Rotary Drill                  | 404  | 229  |
| 1703AEV5          | 5" Grinder - 8.5 amp                   | 245  | 145  |
| 1347AK            | 4-1/2" Grinder with case               | 159  | 92   |
| 1638K             | Drywall Cut-out Unit                   | 165  | 105  |
| 1617              | 1-3/4 HP Router - 2 handle             | 584  | 159  |
| 1617EVS2          | HP Router w/ variable speed - 2 handle |      | 189  |
| 1618              | 1-3/4 HP Router - "D" handle           |      | 179  |

| Model   | Description              | List | Sale |
|---------|--------------------------|------|------|
| 1618EVS | 1618 Router w/ var/speed | 360  | 215  |
| 1640VS  | NEW Power Tenon Saw      | 200  | 129  |
| 1640VSK | NEW Power Tenon Saw Kit  | 370  | 209  |
| 3850K   | 18V cordless Drill Kit   |      | 255  |

| Model | Description                          | List | Sale |
|-------|--------------------------------------|------|------|
| 750   | 12"x24"x28" 1/4 HP 200 CFM - 750 CFM | 249  | 249  |
| 8-12  | 20"x24"x44" 1/3 HP 800 & 1200 CFM    |      | 479  |

| Model  | Description                                | List | Sale |
|--------|--------------------------------------------|------|------|
| J605   | 6" Jointer - open stand                    | 429  | 299  |
| J605XW | 6" Jointer - closed stand and extra knives | 499  | 499  |
| J805   | 8" Jointer - closed stand                  |      | 1189 |

| Model     | Description                                                     | List | Sale |
|-----------|-----------------------------------------------------------------|------|------|
| JWBS140S  | 14" Band Saw 3/4 HP - open stand                                | 495  | 495  |
| JWBS14CSW | 14" Band Saw 1 HP - closed stand with rip fence and mitre gauge | 579  | 579  |

|             |                                                                                 |          |
|-------------|---------------------------------------------------------------------------------|----------|
| JWTS10CW2PF | 10" Contractor Table Saw with 30" Exacta fence 1-1/2 HP & cast iron wings ..... | Sale 649 |
| JTAS10X501  | 10" Tilting Arbor 3 HP Table Saw with 30" Exacta fence .....                    | Sale 769 |



## Get Good Pick Up From

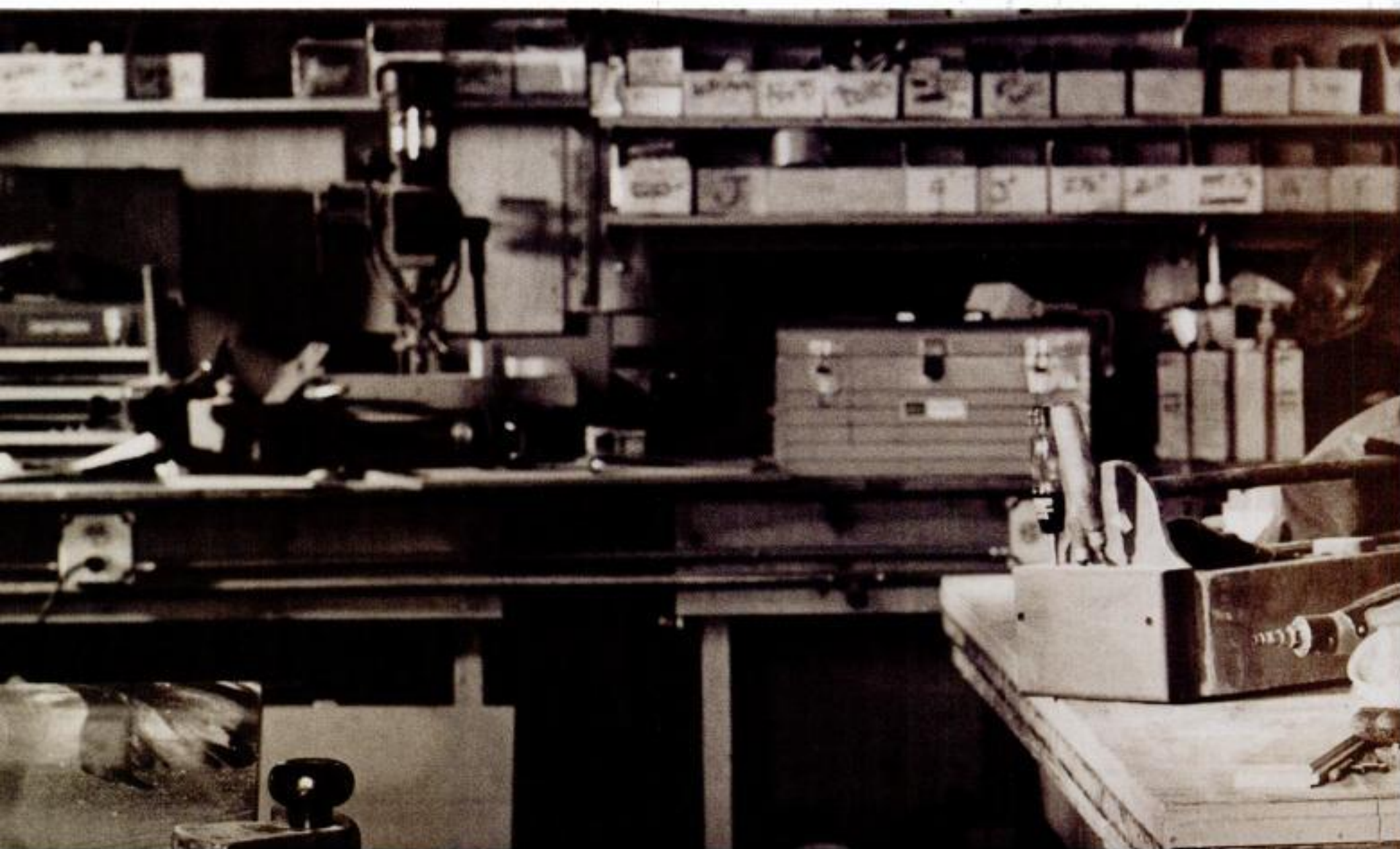
Dust is a problem—it's everywhere. Ridgid offers a couple new solutions.

Their WD1730 shop vacuum has a huge 6.25-hp motor and a 16-gallon tank. The hose locks into place so you can pull the vacuum around by the hose (not that we ever do that!) without the hose coming loose. The two-stage filter, according to Ridgid, will catch even drywall dust.

If your shop vacuum needs to travel from shop to house to garage, you'll like the heavy-duty cart on the 1730. Big wheels make rolling easy, even up stairs. And you can store lots of accessories on board. Buy this sucker for under \$150 at Home Depot.



WD1730





## Two New Ridgid Vacuums



TOOL VAC

Use Ridgid's new Tool Vac to collect dust right at the source. This 3-gal. vacuum uses a 6-amp motor and is designed to connect directly to portable power tools.

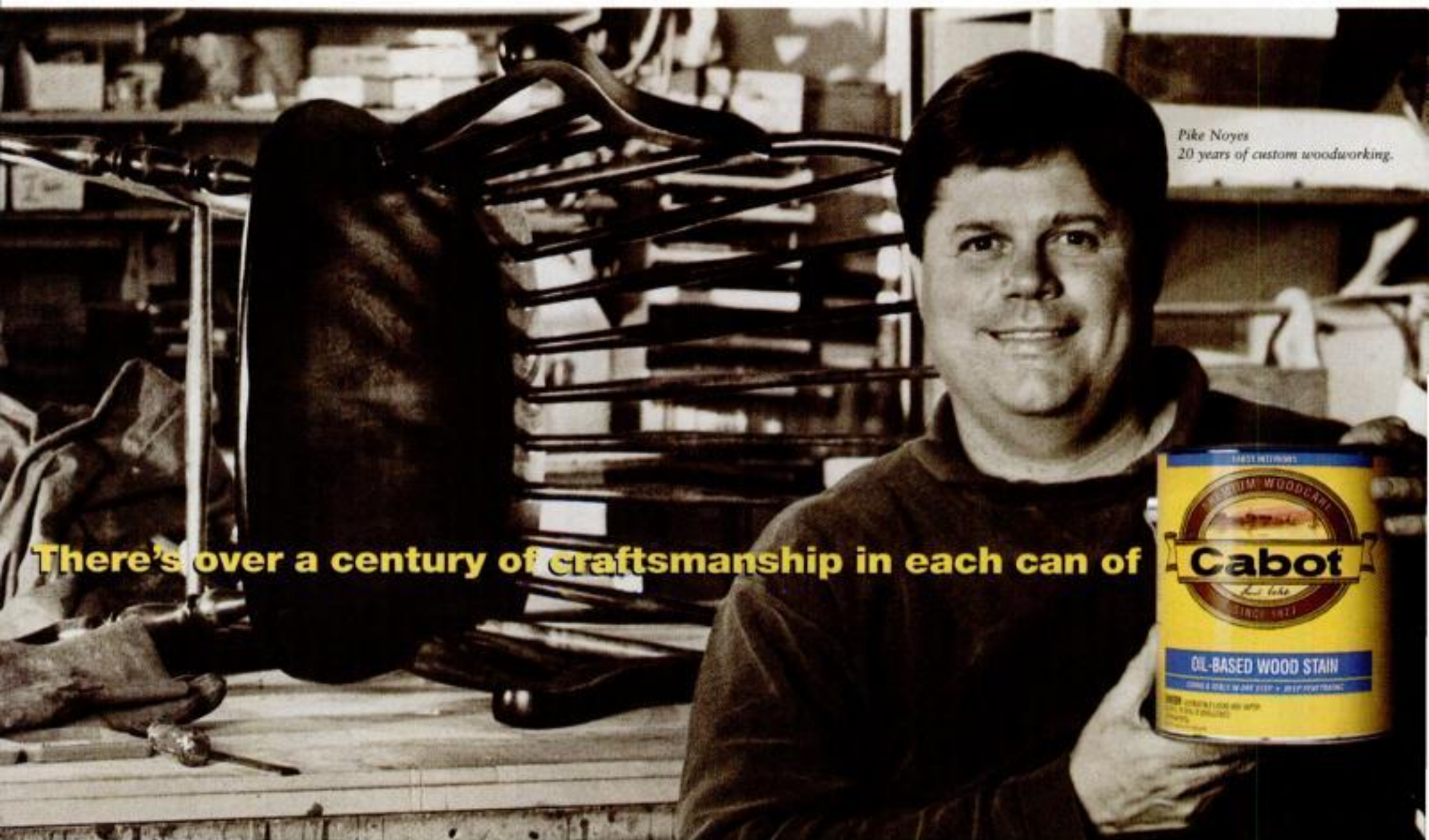
Plug your portable tools right into the vacuum and when you turn on the tool, the vacuum runs too. It'll continue running for five seconds after you shut off the tool to clear the line.

Tools as low as .35 amp, like detail sanders, will activate the vacuum.

Here's another cool thing: the vacuum handles tools up to 8 amps and compensates for high tool amperage by lowering the vacuum's current draw. Both tools together won't exceed 15 amps, so you shouldn't pop any breakers.

The 1¼-in. hose is a useful 11-ft. long and comes with hook-and-loop strips so the hose and cords can be tied together to stay out of the way. The power cord is 20-ft. long, so you should be able to reach anything in your shop.

This vacuum is also available for under \$150 at Home Depot.



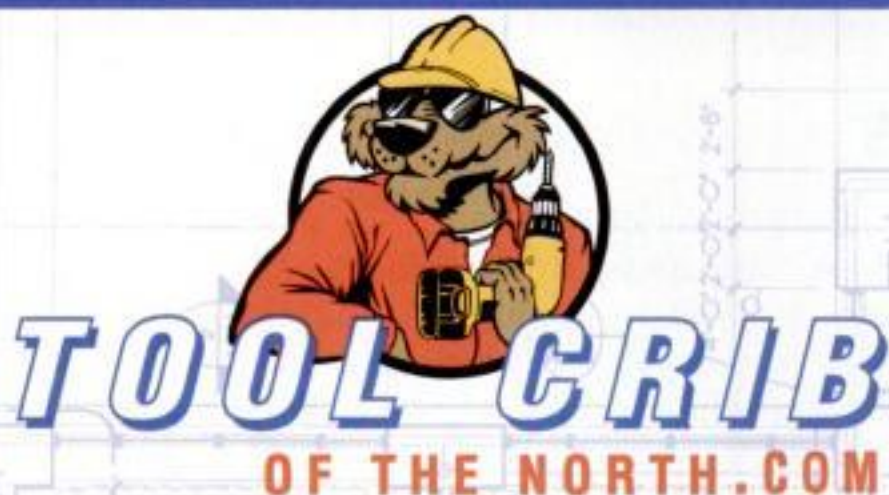
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AWW 78-129

## Product Reviews



## It's a Rasp, It's a Plane, It's a Microplane

As woodworkers, we try not to think about tools cutting bone. We'll leave that to the surgeons. Curiously, however, the need for tools to cut bone lead to the development of Grace Manufacturing's Microplanes.

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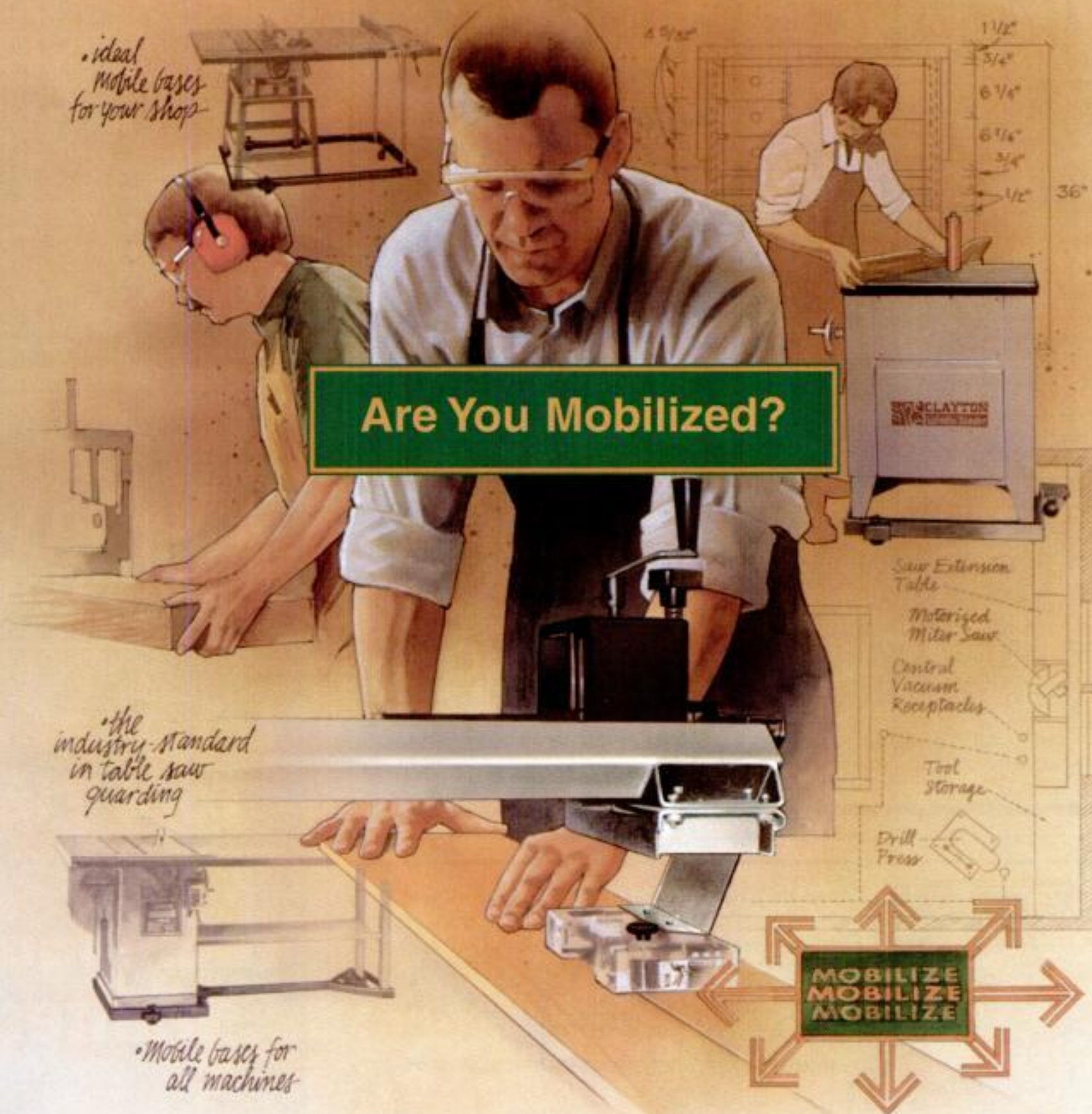
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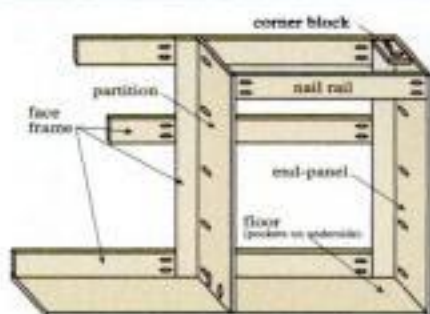


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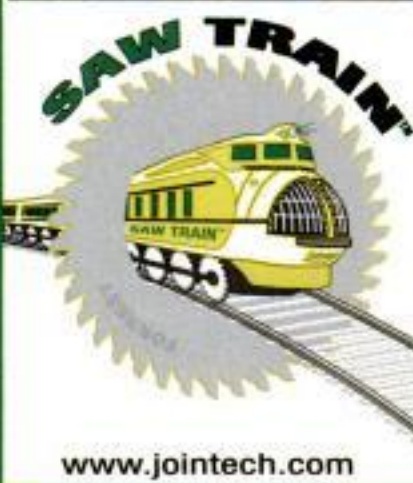
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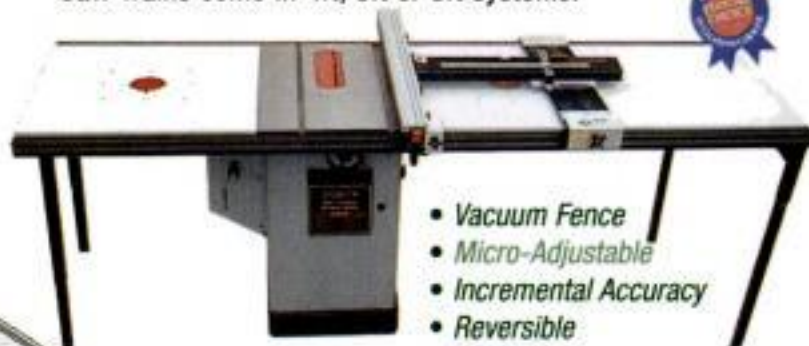
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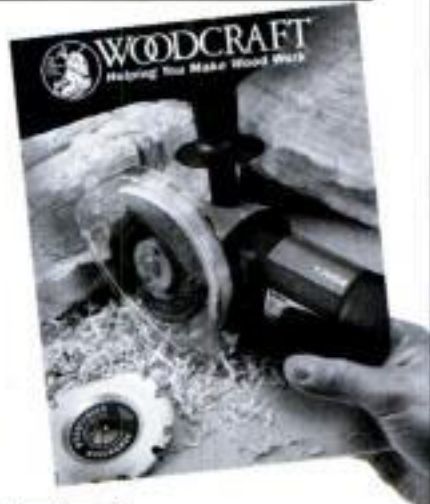
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# Waterborne Polyurethane Basics



**W**aterborne polyurethanes are quickly gaining popularity. It's easy to see why: They're just as durable as their solvent-based counterparts and they dry faster with less odor; they present a lower fire risk; and you can clean up with soap and water.

Here are answers to the questions I'm most frequently asked.

## Why is waterborne poly white?

The main ingredients of waterborne poly don't dissolve one another. Instead, water and urethane molecules (which are both colorless) are combined in an emulsion, a type of mixture in which insoluble substances can be suspended together. In this emulsion, the water and urethane molecules refract light differently, making the mixture appear opaque, like milk.

After being laid on a surface, the water evaporates, leaving the solids covering the surface in a protective, colorless film.

## Which applicator works best?

For flat surfaces, I prefer a paint pad—a square, flat plastic plate covered with thousands of tiny bristles. They are designed for applying latex paints, which are really just another waterborne finish. Soft-foam-backed versions (without handles), made for contoured surfaces, are a joy to use on flat surfaces too. Finishing pads made of velour fabric don't lose bristles and lay on a smooth, thin coat.

Many folks swear by foam brushes saying they eliminate brush marks and air bubbles and are easy to use.

One good bristle brush is all you'll need for flat surfaces, edges and inside corners. It will hold lots of finish, but deliver only the amount you need, exact where you want it. Brushes with tapered nylon bristles are best. Natural bristles don't work well because they tend to splay in water and lose their shape.





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*The distinct comfort zones in NatureSleep Platinum have revolutionized the sleep-product industry. They reduce sleep stress—especially strain on the spine—and cradle those areas of the body prone to increased pressure.*

by Christine Wolf



I lead a hectic life. Between my part-time job, the kids, after-school activities and sports, my days are filled with things to do, places to go and people to see. This non-stop activity from dawn until dusk can be fulfilling, but it can also be pretty stressful, so at night, I need to relax and recuperate. Nothing helps me rebound like a good night's sleep, and nothing helps to promote restful therapeutic sleep like the proper mattress.

**Tossing and turning.** Unfortunately, mattresses can range in price from \$150 to more than \$2,000. Plus, even some expensive mattresses fail to support your body evenly. Traditional mattresses provide a flat sleep surface, supporting your body at the shoulders, the hips and the heels. This leaves your lower back and legs unsupported and hinders proper circulation. Even expensive waterbeds, which are supposed to distribute weight evenly, fail to support the body properly. Your spine arches downward, in a position specialists refer to as "hammocking," causing excessive strain on the back. Scientists and doctors agree that the ideal position is a neutral body posture in which the different parts of the human body are supported individually and evenly. This is the secret behind NatureSleep Platinum, the revolutionary new product that turns any bed into the ideal sleep surface.



*Scientists and doctors agree that the ideal position is a neutral body posture in which the different parts of the human body are supported individually and evenly. This is the secret behind NatureSleep Platinum, the revolutionary new product that turns any bed into the ideal sleep surface.*

**Scientific solution.** Anatomic Concepts, a medical products research and manufacturing company, has designed a patented and anatomically-correct mattress pad. Using research originally conducted for hospitals, this innovative company developed an effective, affordable way to transform any mattress into a specially-designed sleep surface that closely matches the shape of the human body. It features a patented five-zone sleep surface that holds the body in a neutral posture and redistributes pressure during sleep.

**Comfort zones.** The distinct comfort zones in NatureSleep Platinum have revolutionized the sleep-product industry. They reduce sleep stress—especially strain on the spine—and cradle those areas of the body prone to increased pressure. The first zone supports your upper neck and head, and is so effective that you may find yourself using thinner pillows. The second zone allows your shoulders to "sink" to a comfortable level, while the third zone supports your lower back. Your hips and buttocks have room to relax with little or no pressure in the fourth zone, and the fifth raises your upper legs to keep your spine in the neutral position. This patented system results in a supportive, super-comfortable sleeping surface that promotes more restful sleep. Until now, only the most expensive and most advanced mattress products featured this degree of technology, but now you can

enhance your existing mattress.

**Installs in seconds.** NatureSleep Platinum fits right over your existing mattress, uses normal sheets and turns any bed into an anatomically-correct and incredibly comfortable sleep surface. The five comfort zones have been created using a computer-designed grid pattern and are engineered to accommodate people of all heights and sizes.

**Risk-free.** Don't you owe it to yourself to get a restful, therapeutic night's sleep? After one week of sleeping on a NatureSleep Platinum, you'll wonder how you could have tortured yourself all of those years by sleeping on a hard, flat surface. You'll never go back again! Best of all, you can try NatureSleep Platinum on your own bed, risk-free. It comes with a one-year manufacturer's limited warranty and Comtrad's exclusive risk-free home trial. Try it, and if for any reason you are not completely satisfied, return your purchase within 90 days for a full refund, "No Questions Asked."

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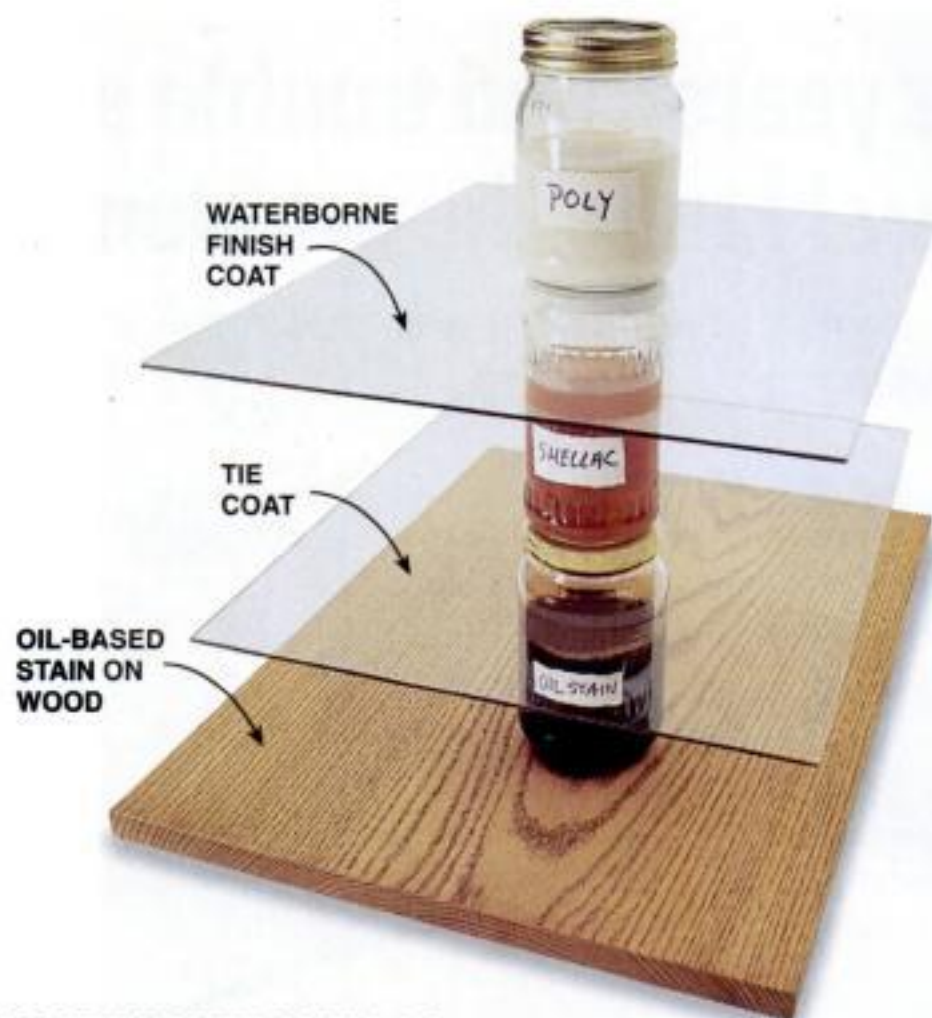
## Just Finishing

### Can I put waterborne poly finish over oil-based stain?

The answer to that question is a definite "maybe." I've seen finishes that laid down nicely over completely dried oil stains, but I've also seen some that peeled off in sheets within six months. A lot has to do with the brand of finish and the brand of oil stain. At best, it is risky, unless you use a "tie coat."

As its name implies, a tie coat ties one type of finish to another with good adhesion. In this case a thin coat of dewaxed shellac will do the trick. The shellac will stick to the dried oil stain and the waterborne poly will stick to the shellac.

Unfortunately, most pre-mixed shellac contains wax, and waterborne poly will not stick to wax, so you'll have to mix your own dewaxed shellac from flakes (see Sources, p. 110). Mix about two ounces of dewaxed shellac flakes into a pint of denatured alcohol and apply one thin coat to the stained wood. In about two hours you can apply the waterborne finish.



**USE DEWAXED SHELLAC** as a "tie coat" between oil-based stain and waterborne poly. It will eliminate compatibility problems.

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## Why doesn't waterborne poly look good on dark woods like walnut?

Waterborne poly makes dark woods, like walnut or rosewood, look pale or pasty. Two things contribute to this. Fortunately, both can be countered.

First, most common finishes, like oil varnish and lacquer, are slightly amber colored. This amber color makes wood look warmer. Waterbornes, on the other hand, are either colorless or slightly bluish-gray so they don't add warm tones. The solution: Tint the waterborne finish with amber-colored dye (see [Sources, p. 110](#)). Dissolve the dye powder (either water- or alcohol-soluble) according to the man-

ufacturer's directions. Then add one or two tablespoons of the liquid dye to a quart of finish. Don't be alarmed by the ugly brown color the waterborne turns—it'll look much better when it dries.

Second, oils, shellac and even lacquer make wood look wet because the mole-

cules of finish are small enough to get down into the wood fiber. The result is similar to what you'll see if you put oil on a brown paper bag—the paper gets darker and translucent. Molecules in waterborne polys are gigantic compared to those in other finishes. Instead of getting into the

wood fiber and "wetting" it, they can only lay on the surface in a colorless film. A slick way around this problem is to seal the wood first with a compatible finish that makes the wood look wet, such as dewaxed shellac.



**IMPROVE THE LOOK** of waterborne poly quickly and easily. A thin seal coat of dewaxed shellac "wets" the wood (ironically, something waterborne poly doesn't do!), bringing out the figure and giving it depth. Adding amber dye to the poly warms the appearance of the wood to which it's applied. Using both, shellac to wet and dye to warm, improves the look dramatically.

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A large advertisement for the Jorgensen E-Z Hold II bar clamp. The background is a solid blue. In the foreground, three hands are shown using the clamp on different wood blocks. The first hand is on a block labeled 'CLAMP', the second on a block labeled 'SPREAD', and the third on a block labeled 'HOLD IT'. Each hand is holding the handle of the clamp, which is clamped onto the wood block. The clamp has a long, silver-colored bar and a black handle. Below each hand, the text 'with one hand.' is written. At the bottom, the Jorgensen logo is shown, followed by 'E-Z HOLD II' in large, bold letters. To the right of this, the text 'It's a smart thing!' is written in a stylized font.



RAISED  
GRAIN

## Just finishing

### Waterbornes contain lots of water, so won't they raise the wood's grain?

Yes, any product containing water will raise the wood's grain, making it feel rough after it dries. The trick is to purposely raise the grain and cut it back down *before* you apply the finish.

To raise the grain, sponge clean water liberally over the wood after your last sanding and wipe it off so no puddles remain. Let the wood dry overnight and in the morning you should have raised grain. With

**RAISED GRAIN**, the morning after.

320-grit sandpaper, quickly "scuff sand" the surface with very light pressure so you remove only the raised wood fibers. Move on as soon as the wood feels smooth. Sanding *too* much creates new shredded wood fibers that will raise up when the finish goes on. It's a lot like shaving. You want to remove the hair that stands up, but stop before you cut into the skin!

#### SOURCES

Lockwood water-soluble dye powder (Early American Maple), super-blonded dewaxed shellac flakes; Constantines, (800) 223-8087, [www.constantines.com](http://www.constantines.com)  
Propylene glycol; Cole-Palmer, (800) 323-4340, [www.colepalmer.com](http://www.colepalmer.com)

### Waterbornes don't smell much. Does that mean they're made without harmful solvents?

No. It's true that waterborne polys contain mostly water, but they also contain volatile organic compounds (VOCs), just like their traditional counterparts. The real difference is that they have far fewer of them.

For example, lacquer typically contains about 75-percent hydrocarbon solvents and about 25-percent "solids." The solids make up the finish that will remain on the wood after the solvent evaporates. Waterborne coatings generally contain less than 10-percent hydrocarbon solvents, and as much as 35-percent solids, with water filling in the rest. With such a small percentage of solvent, you don't need as much ventilation as you would with lacquer. However, you still need some. If you spray, use your spray booth; if you brush, crack a window and run a fan on low speed. Always wear a mask equipped with organic vapor cartridges.



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## Why are there bubbles in my finish?

Air bubbles trapped in the finish are one of the more vexing problems associated with waterborne coatings.

You can usually minimize the problem with good application technique.

First, don't brush too hard or fast—it's sure to generate air bubbles. Stick to a smooth, gentle application technique and use paint pads and bristle-free foam brushes when you can. Still, clusters of very tiny bubbles, called "foam," sometimes show up in the dried finish. The result, particularly in gloss finishes, is an uneven, hazy look that no amount of rubbing or polishing will remove. You can often minimize these pesky air bubbles by stirring about an ounce of "half and half" into a quart of finish before you apply it.



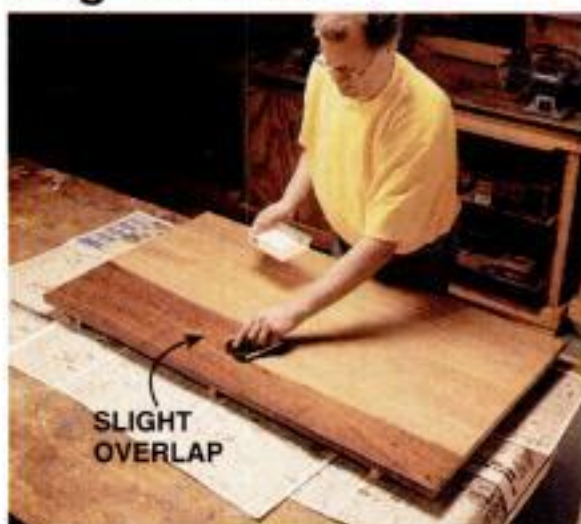
**ADD HALF AND HALF** to counteract "foaming," tiny bubbles that can form in the finish and get trapped there as it cures. Don't worry; half and half, like waterborne finish, dries clear.

## How do I avoid brush marks on a large surface?

Use a paint pad or foam brush. They're less likely to leave marks than a bristle brush. Part of the problem, though, is that waterborne poly dries so fast that there is no time to "work it out," especially over a big surface. Going back and forth will only make it look worse.

Another problem is that folks frequently apply too thick a coat on each pass. Put on only as much as you need to get the surface entirely wet. This is true whether you are spraying, brushing or using a pad. A good rule of thumb is to put on less than you think you should.

If you must, you can slow down the drying time a bit by adding an ounce of propylene glycol to a quart of finish. You can get [propylene glycol from a chemical supply house](#) (see Sources, p. 110) or at most cigar stores, because it is used to "charge" the humidification devices used in humidors. **AW**



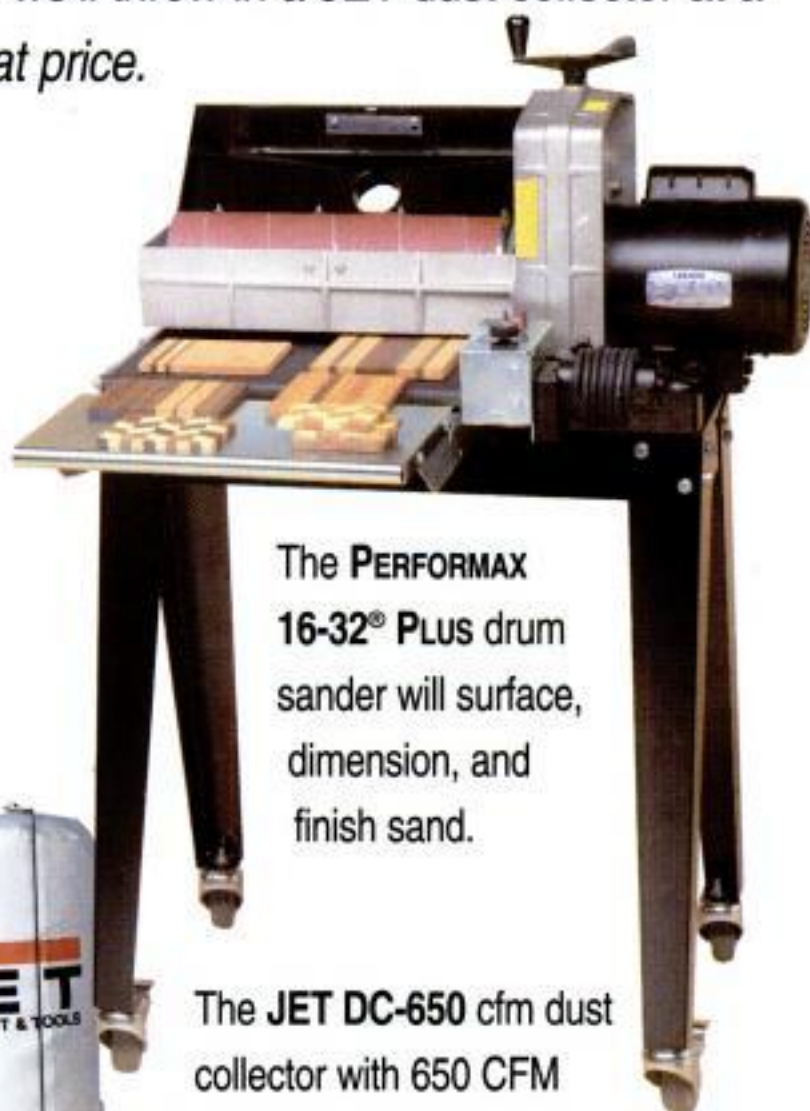
**LAY THE FINISH ON A LARGE SURFACE** in successive, slightly overlapping end-to-end strokes, each about as wide as your pad or brush. Wet the surface with the first pass, go back over it only once to smooth and level the finish and then move on. Work fast and don't go back.

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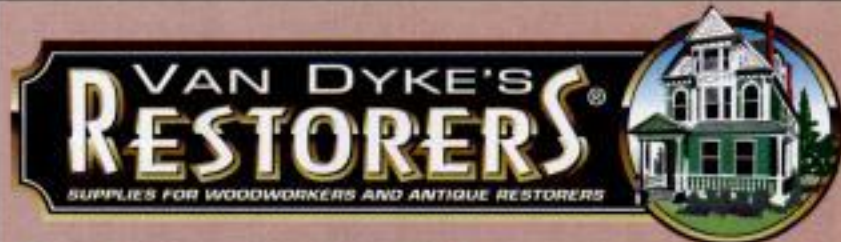
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- Rabbet cut: 3/8"
- Knives: 3
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- Cutter head size: 3"
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- Weight: 1-4/5 lbs.

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- Table bevels 45° left and right
- Factory reconditioned, factory perfect

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Bosch 1587AVSP

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Milwaukee 0502-24

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DRIVER & 5-3/8" SAW  
COMBO PACK**

Drill features variable dual speeds of 0-450/0-1100, 3/8" keyless chuck, adjustable torque control, electric brake, and anti-slip grip. Saw is capable of cutting 2X material in a single pass. Operates at 3000 RPM, has a 50° bevel capacity. Kit includes drill, saw, TWO XR PACK batteries, one hour charger, case, and saw blade. Factory re-conditioned, factory perfect.

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51650-1KNA

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W/KEYLESS CHUCK**

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ITEM 34231-6KNA

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PRESS WITH KEYED CHUCK**

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01844-6KNA

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TO 50%

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PRESSURE,  
NON-MARRING  
HARDWOOD CLAMPS**

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| 10"           | 6"              | 04853-1KNA | <b>\$3.99</b> |
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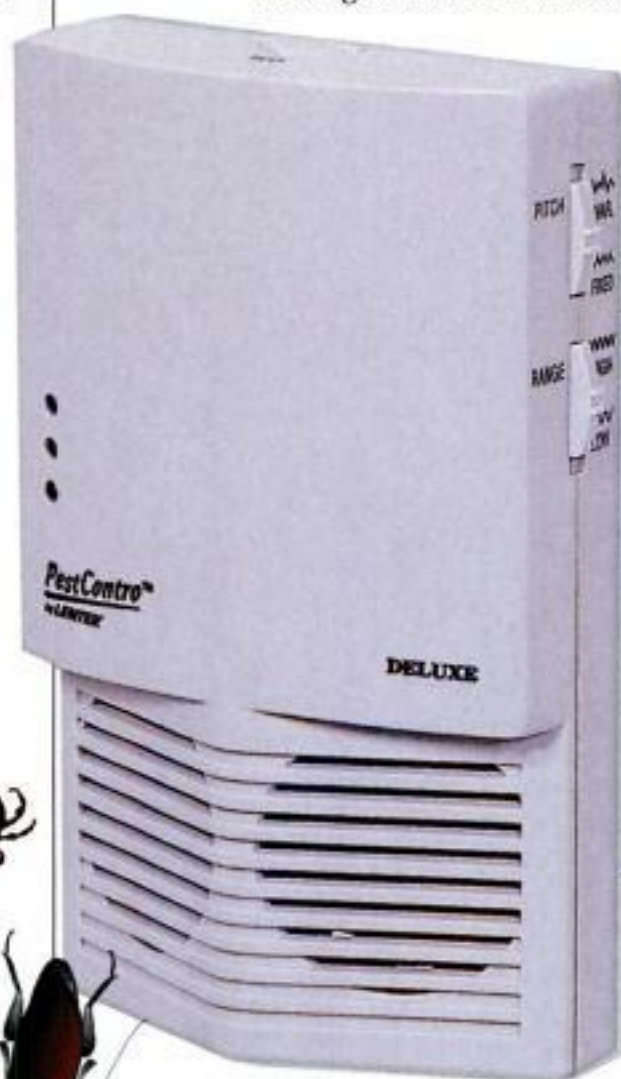
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that may be affected by certain pitches, like lizards, hamsters and gerbils.

**Just plug it in.** Simply place the PestContro unit in a centrally located area and it goes to work immediately, using a new technology called "phase-shift-current." By shifting the

electromagnetic field throughout the home's wiring, it controls pests in the walls, ceilings and floors, where the majority of pests live. This interference covers an area of up to 5,000 square feet. Then, the dual speakers each blast 120 dB of ultrasonic sound. You can use the intensity selector to customize your control. Lower ultrasonic sounds tend to influence larger creatures, such as rats, lizards, roaches and spiders. The higher setting is more irritating to smaller

*What a wonderful product! I am thrilled! PestContro really works! For the first fall season ever I have not been plagued by spiders, ants or mice...I'm rid of the pests without messy removal tasks or putrid odors.*

—Angela L.  
Orlando, FL



pests, such as ants, ticks, fleas and other insects.

**Practical features.** In addition to selecting the intensity, you can use the pitch selector to choose a fixed pitch or a variable pitch that sweeps within a range of ultrasonic frequencies. You can hear the difference by pushing the Test button, which lowers the ultrasonic

frequencies to an audible level. The Random On/Off setting automatically turns each speaker on and off randomly to keep pests from becoming accustomed to the ultrasonic sounds. There's even a Floor Night Light for placement in a hall or dimly lit area. Each LED represents different properties of PestContro. The Red LED flashes continually when the unit is powered. The Green LEDs represent sound emitted from each of the speakers and flash randomly in the Variable setting. PestContro is registered with the EPA and is UL ap-

proved. Since it uses less electricity to operate than a 40 watt light bulb, it costs just pennies a day to operate.

**Repel pests from your home...risk-free.**

Why wait to use the latest technology to solve your home's pest problems? PestContro comes with a two-year manufacturer's limited warranty and Comtrad's exclusive risk-free home trial. If you are not satisfied for any reason, simply return it within 90 days for a full "No Questions Asked" refund.



## The future of pest control technology

1. Audible Frequency Test Button
2. Continuous/Random Control
3. Variable Fixed Pitch Control
4. High/Low Intensity Control
5. Left Speaker Indicator
6. Right Speaker Indicator
7. Phase-Shift-Current Indicator
8. Floor Light Switch

**Pest Contro Deluxe . . . \$69.95 \$7.95 S&H**  
**Additional Units . . . . . \$59.95 each**

Please mention promotional code 6641-16848.

For fastest service, call toll-free 24 hours a day

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To order by mail, send check or money order for the total amount including S&H. Or charge it to your credit card by enclosing your account number and expiration date.

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# Years of research and testing result in electro-magnetic pest control breakthrough

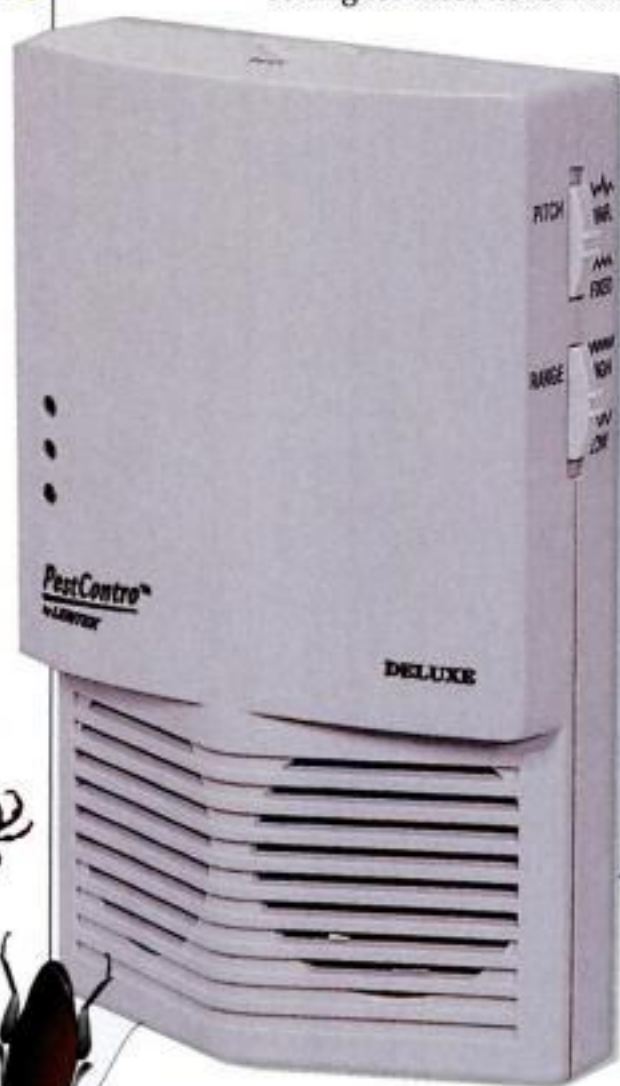
*PestContro uses electro-magnetic and ultrasonic technology to control a variety of pests in your home safely, silently and effectively.*

**S**ometimes I think exterminators scare me more than they do pests. Maybe it's the uniform, maybe it's the hard hats, but when I see them getting out of their trucks with protective clothing and tanks full of dangerous chemicals, I begin to wonder. I have small children, a dog and a cat, so I'm not too keen on the idea of somebody bombarding my home and yard with dangerous chemicals. On the other hand, I'm not too fond of ants, flies, rodents, fleas, spiders, cockroaches and other common household pests. Recently, a neighbor of mine told me about a revolutionary new way of ridding my home of pests without endangering my family. It's called PestContro.

**Double trouble for pests.** PestContro combines electromagnetic technology and ultrasonic waves to solve a variety of household pest problems. This amazing device uses your home's existing electrical wiring to create a shifting electromagnetic field. This creates an environment that is uncomfortable for pests, driving them from their hiding places in walls, ceilings and floors. Simultaneously, a harsh, ultrasonic siren blasts sound from the unit's dual speakers. This sound is inaudible to humans, but it creates an incredible disturbance for pests. In two to four weeks, the pests are driven from the area.

**Safe and effective.** Even though it makes life unbearable for a variety of insects, rodents and other pests, PestContro is harmless to children

and household pets, such as cats, dogs, fish and birds. The unit features a two-setting intensity selector that allows you to adjust the setting for those household pets



that may be affected by certain pitches, like lizards, hamsters and gerbils.

**Just plug it in.** Simply place the PestContro unit in a centrally located area and it goes to work immediately, using a new technology called "phase-shift-current." By shifting the electromagnetic field throughout the home's wiring, it controls pests in the walls, ceilings and floors, where the majority of pests live. This interference covers an area of up to 5,000 square feet. Then, the dual speakers each blast 120 dB of ultrasonic sound. You can use the intensity selector to customize your control. Lower ultrasonic sounds tend to influence larger creatures, such as rats, lizards, roaches and spiders. The higher setting is more irritating to smaller

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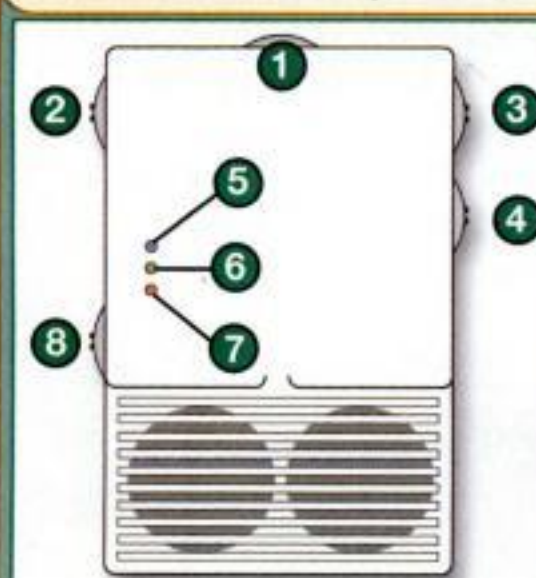
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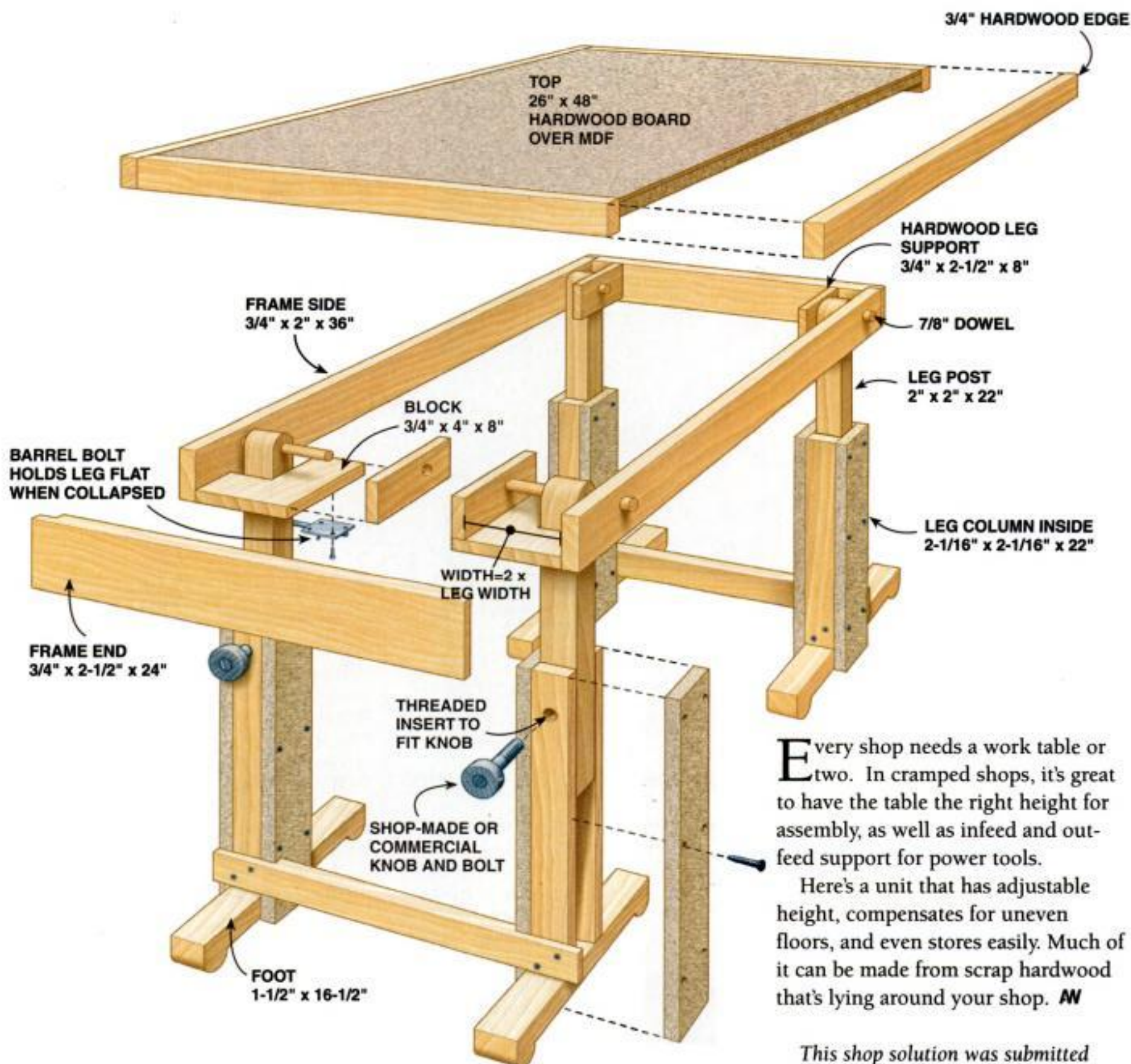
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# Collapsible Work table



Every shop needs a work table or two. In cramped shops, it's great to have the table the right height for assembly, as well as infeed and out-feed support for power tools.

Here's a unit that has adjustable height, compensates for uneven floors, and even stores easily. Much of it can be made from scrap hardwood that's lying around your shop. **AW**

*This shop solution was submitted by Michael and Christine Powell, Bellingham, Wash.*

If you have a great shop solution, send it to us with a sketch or photo and a brief explanation. We pay \$200 for each one we print. Send to: Shop Solutions, American Woodworker, 2915 Commers Drive, Suite 700, Eagan, MN 55121. Submissions can't be returned and become our property upon acceptance and payment.



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- **DuPont Teflon® Coatings** reduce friction, heat and resin build-up and protects from corrosion.
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