

# WOOD

**INDEX**  
Projects, tips, techniques  
from issues 17 through 24

THE MAGAZINE FOR HOME WOODWORKERS

\$3.95

OCTOBER 1988 • ISSUE NO. 25

Display until October 11

## 10 LAYOUT TOOLS

no woodworker should be without

## TOUR A MODERN-DAY FURNITURE FACTORY

See page 38

## BECOME A FRAMING PRO

Master the techniques framers use daily to preserve artwork

## START BUILDING HOLIDAY GIFTS NOW!

Kid's wheelbarrow

Mini safe

Bill/key keeper

Turned napkin rings

Rolling pin and rack

Zoo carousel

Cattail centerpiece

Glue caddy

Oval marker

## SHOWCASE YOUR COLLECTIBLES IN THIS CURIO CABINET

See page 60



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\*Model 34-782 shown with accessory table boards and motor cover.

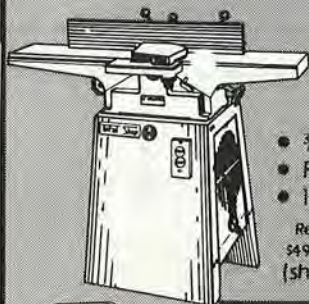
\*\*Model 34-761 shown with accessory motor cover.

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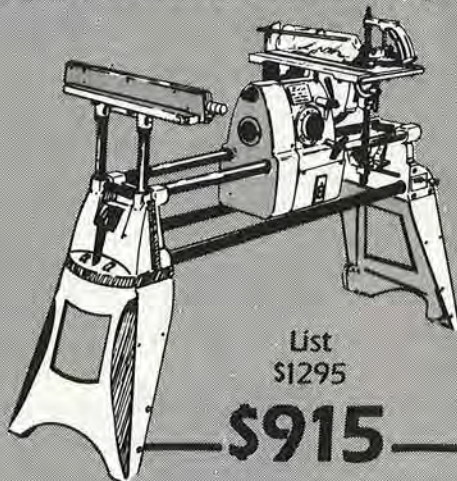
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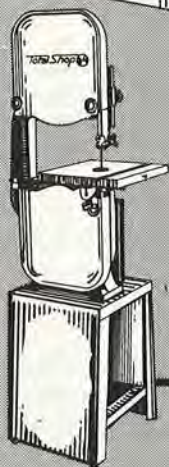


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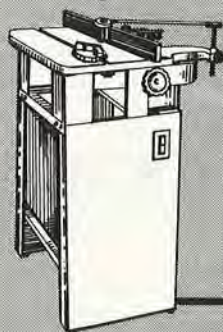
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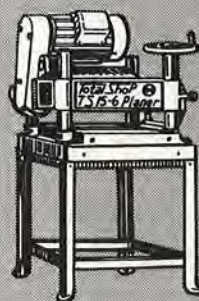
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- Compact size

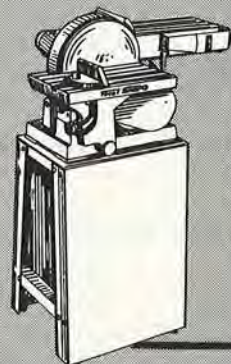
Reg. \$348.00  
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### TS 15-6 Planer

- 110v (owner convertible to 220v)
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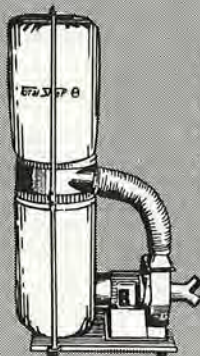
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Better Homes and Gardens®

**WOOD**

This issue's cover wood grain: zebra wood

OCTOBER 1988

ISSUE NO. 25

WOOD PROFILE

**SASSAFRAS: THE LOOK-ALIKE  
WOOD BETTER KNOWN AS TEA 33**

Native Americans have long valued sassafras for its medicinal value. Today's woodworkers treasure sassafras, too, because of its attractive grain. Learn more about an American species with a distinctive aroma.



**CRAFTSMAN CLOSE-UP  
TURNINGS BY THE SEA 34**

The Weston family produces more than exceptional photographs. Neil, a son of Edward Weston, has made a name for himself at the lathe. Find out how Neil turns humongous bowls in Carmel, California.



**CRAFTSMANSHIP  
BY THE CARLOAD 38**

The automated production lines at Thomasville Industries bear several resemblances to your home workshop. Take a closer look at a company that consumes veneer by the mile.



**SHOP-TESTED TECHNIQUES  
YOU CAN FRAME LIKE A PRO 42**

Woodworkers who focus on building an attractive frame may easily overlook the importance of properly preserving artwork. This article shows how to do it!



**HOMEMADE TOOL  
OVAL MARKER 48**

It's a bonus when a reader drops by our shop to show off a device to simplify a tricky task.

**EXOTIC WOOD NAPKIN RINGS 50**

An importer of Central and South American hardwoods shows how he turns thin napkin rings from exotic wood scraps.

**CUMULATIVE INDEX — ISSUES 17 to 24 51**

Our index covering the last eight issues will save you time when you're searching for one of our projects, techniques, or other articles.

**DEVELOP YOUR SHOP SKILLS**

**GET SMOOTH RESULTS WITH YOUR BELT SANDER 55**

A belt sander in untrained hands can severely gouge carefully assembled boards. Don't let this helpful tool get the best of you.

**UNCOMMON STOCKS 56**

Over coffee in Warsaw, Missouri, you're liable to hear folks bragging about the local stock market. That's right: Warsaw's Reinhart Fajen, Inc., produces America's most prestigious line of gun stocks.



**SHOWCASE YOUR COLLECTIBLES WITH THIS STUNNING CHERRY CURIO CABINET 60**

When you build this cabinet, you'll appreciate the four identical sub-assemblies that simplify the construction. Then, watch the cherry cabinet appreciate over the years right along with its valued contents.



**10 LAYOUT TOOLS EVERY WOODWORKER NEEDS 66**

Whether you're drawing precise plans at a drafting table or executing them at your workbench, we have a list of tools you shouldn't be without.

**ON-THE-GO GLUE CADDY 68**

A good idea from our shop organizes your glue and gluing supplies.

**PRESEASON HOLIDAY PROJECTS**

**ROLL OUT THE WHEELBARROW 70**

Our early-bird holiday gift section opens with a pint-size hauler that kids will love.



**FANCIFUL ZOO CAROUSEL 72**

We can just about guarantee that the spinning action of this wild-animal carousel will catch the eye of young and old.



**TURNED ROLLING PIN 74**

You'll appreciate the display rack accompanying this project.



**OAK SAFE AND BILL/KEY KEEPER 77**

Brass post office lockbox doors highlight two practical gifts. Build one as a decorative safe and hang the other for keys and correspondence.



**HANDCRAFTED CATTAILS AND REEDS 80**

Whip up a handful of these roadside favorites in an evening for someone special on your gift list.



**SHORT FEATURES**

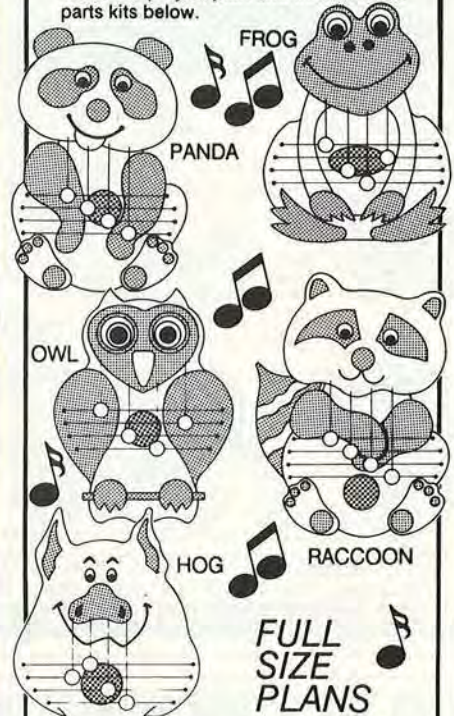
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Tips from Your Shop (And Ours) . . . . . 16	Products That Perform . . . 83
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- #7765 Raccoon HDW Kit ..... \$6.50/EA
- #7766 Panda HDW Kit ..... \$5.50/EA
- #7767 Owl HDW Kit ..... \$7.50/EA
- #7768 Frog HDW Kit ..... \$6.50/EA
- #7769 Hog HDW Kit ..... \$6.25/EA

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BA-2" 60 each

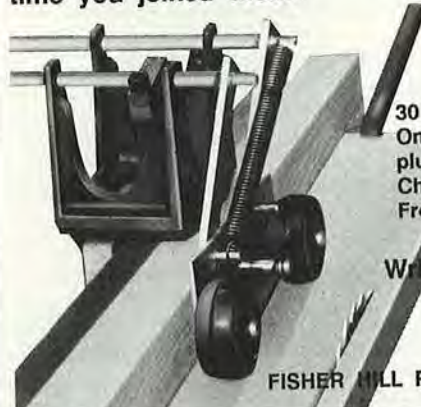
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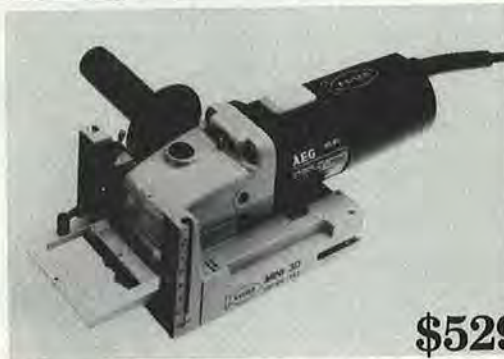
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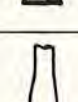






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## THE EDITOR'S ANGLE

# BRIAN TAKES THE BLUE... AGAIN



At the Iowa State Fair, Brian Gutzmer and *WOOD*® magazine Project Builder Jim Boelling show off Brian's blue-ribbon-winning 4-H project.

So far, 15-year-old Brian Gutzmer from rural Council Bluffs, Iowa, has a perfect record. Every time he enters a woodworking project in a 4-H competition—most recently at the Iowa State Fair—the judges see blue. I'm happy to report that *WOOD* magazine had a small part to play in Brian's latest award-winning achievement—he built the thickness sander from our October 1985 issue.

Of course, Brian does have the edge on his competition. This fine young woodworker got his start in woodworking at age 2 when, with his first hammer and saw, he signed on as a "remodeling helper" for his dad, Marlin. No wonder he's so successful!

As you probably know, 4-H projects follow a certain theme each year. This time, it was "projects that extend resources." So the young wheels started turning, and Brian decided to use some wood that he and his dad had sawed from logs on their farm. "I used red elm where I needed strength and walnut on those parts that required hardness," Brian told me. To further extend his resources, this frugal woodworker recycled the plastic-laminated top from an old table for the sander feed table.

Brian also kept track of the material costs as part of his project. Even counting the \$23.50 he invested in pillow blocks and bearings and another \$10 for a used motor and pulley, Brian completed the project for less than \$60. Now that's a bargain.

Keep up the good work, Brian. 🍀

 Print this article

*Larry Clayton*

*P.S. Brian wrote me not long ago and said that for this year's project he's building a 12x20' workshop! We could be looking at a future *WOOD* magazine project builder here, folks.*

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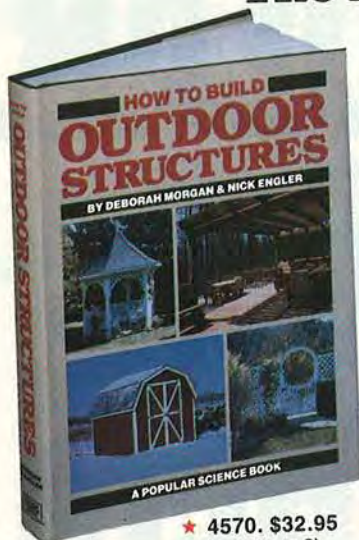
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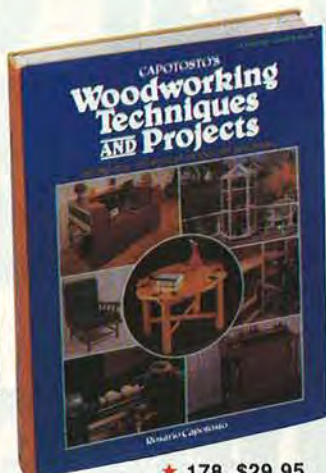
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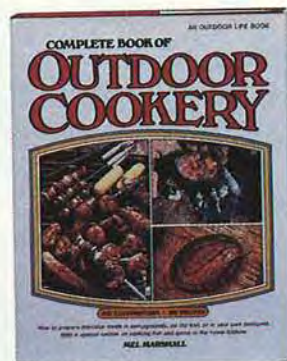
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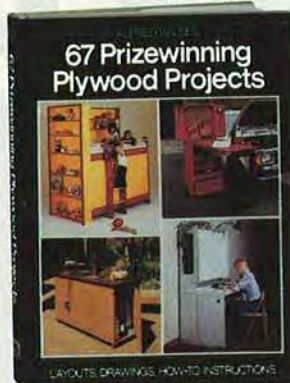
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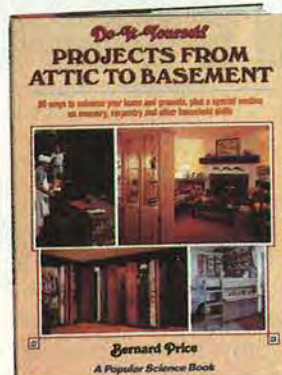
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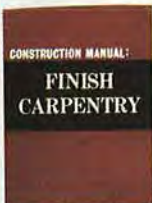
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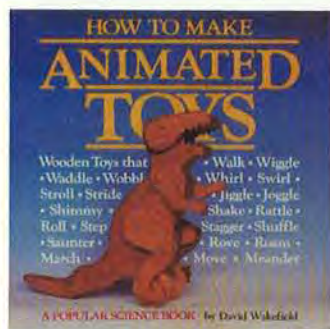
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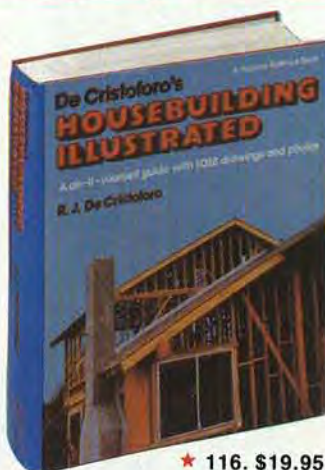
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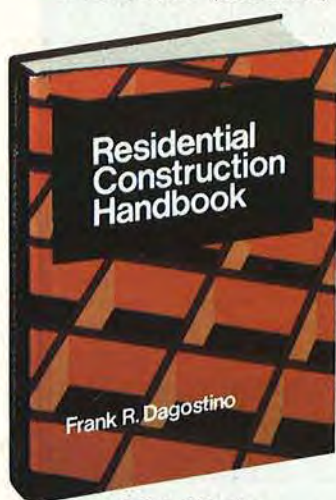
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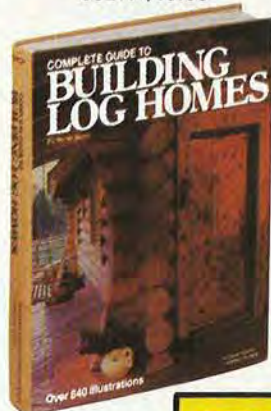
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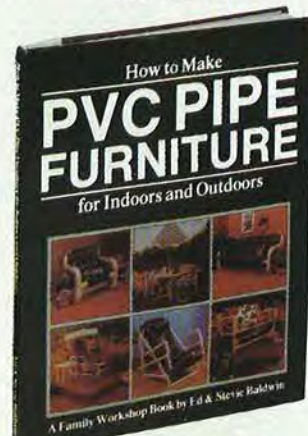
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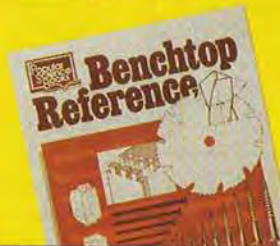


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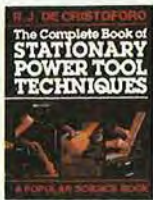
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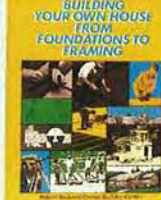
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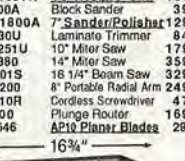
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## TALKING BACK

We welcome comments, criticism, suggestions, and even an occasional compliment. The volume of mail we receive makes it impossible to answer every letter, but we promise to do our best. Send your correspondence to: Letters Editor, Better Homes and Gardens® WOOD® Magazine, Locust at 17th, Des Moines, IA 50336.

### BUCKLED UP IN TENNESSEE

Thank you for the belt-buckle article in the December 1987 issue of WOOD magazine. I saw Christmas presents for my family and friends in that project. I didn't have any special woods like the ones shown in the article, but I did have some walnut and white oak logs to use as the base for the buckle. I also

had some scrap cedar, red oak, poplar, sassafras, and even some ebony salvaged from an old piano.

First, I glued the accent wood between the oak or walnut. With a piece of double-faced tape, I mounted a 2x4 "jobber stick" to the back of the blank so I could safely sand at my disc sander. I sanded down to a 320-grit, and switched to hand-sanding for a 400- or 500-grit finish. I then applied four or five coats of tung oil, two coats of a gloss finish called True Oil, and two coats of wax.

I finished 40 buckles for Christmas gifts!  
—Thomas J. Gillard Jr., Tullahoma, Tenn.

Sounds like you were a busy Christmas elf, Tom. You must be one of those guys who doesn't throw away any scraps of wood!

### DON'T FORGET TABLE BOTTOMS

I'd like to comment on David Sloan's letter in the February 1988 issue of WOOD magazine about stabilizing wood by using a finish. I wonder if education is replacing common sense.

I agree that there are few—if any—moisture-proof finishes. But moisture-resistant is another thing. Even air resists moisture in some instances. If you lay a wide board flat on the ground overnight, it will absorb dew from the ground and be cupped in the morning. Uneven moisture on opposite sides of a board causes the same cupping action. So it follows that if you coat one side of a piece of lumber with finish and leave the opposite side unfinished, the unfinished side absorbs moisture much easier.

So for whatever reason, why not continue what has worked for generations? Some of us old-timers who didn't know better coated both sides of wide areas such as tabletops. Woodworkers should continue to coat both sides of wide areas as insurance against warping. I've made numerous harvest tables, and have never had even one warp.

—C. A. Brown, Waterville, Vt.

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Continued on page 12

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SC-001 Saw Blade Stabilizer 17

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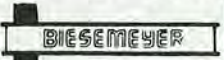
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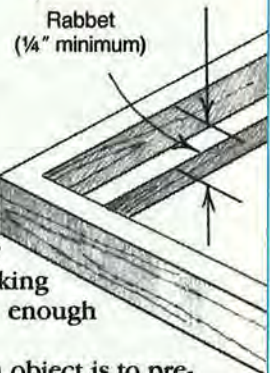
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# TALKING BACK

Continued from page 10

## WHAT'S UP ON RABBETS

Most of the projects in your magazine seem to be well thought out and researched, so I was somewhat shocked in going over the February 1988 issue to see that both the article on making router moldings and the article on making a picture frame do not allow enough room for the picture package.



The true reason for framing an object is to preserve the artwork—it does not have to be museum-quality to need correct framing. The 1/4 x 1/4" rabbet, and even the 1/4 x 3/8" rabbet do not give enough room for the fastening in of a proper picture package. I would say that 1/4 x 1/2" would be the minimum.

I have taught college-level classes on conservation of works of art on paper and frequently consult to museum staffs in this area.

—Richard W. Osborn, Oskosh, Wis.

Good point, Richard. We asked some other experts, and yes, a rabbet should be at least 1/2" deep to allow for all the necessary parts, including a spacer between the artwork and glass in some cases.

We've learned a lot about picture-framing techniques in the last eight months. For example, in our sample artwork project on page 47, the glass, mat, mounting board, and backing board make a 1/2"-thick package; we selected a molding with a 1" deep rabbet. The point: Know the thickness of your picture package before selecting or making a molding, and make the rabbet at least 1/4" deeper.

## SANDING DRUMS: NOT MADE FOR ROUTERS

Recently, I overheard a frightening conversation at a store. A customer complained that no one had warned him not to use a sanding drum in his router. The rubber drum partially disintegrated from the centrifugal force and he nearly ruined the router before he could get it shut off. Luckily, he was not injured.

Although few small sanding drums come with instructions, the 1/4" or 1/2" shanks should be used only with lathes, drill presses, or portable drills. Never put a sanding drum in a high-speed router. In addition, the speed of the router is inappropriate for sanding—it would burn the work. Never use anything in the router except bits made specifically for it.

The many collet chucks now being sold for shapers make it possible that someone will try a sanding drum there, also. Even the 9,000 or so rpm of a shaper turns a sanding drum into a dangerous weapon. You can't be safely sand with a shaper without changing the pulleys to lower the speed.

—John Martin, Cumberland, Maine

Continued on page 14

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how much  
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\* Model 37-350 with stand, 1½ HP, 115/230V, 1 PH motor and push-button switch.

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Offer good only from participating dealers in the continental U.S., Alaska, and Hawaii from July 1 to December 31, 1988.

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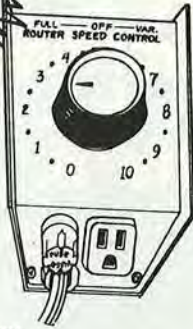
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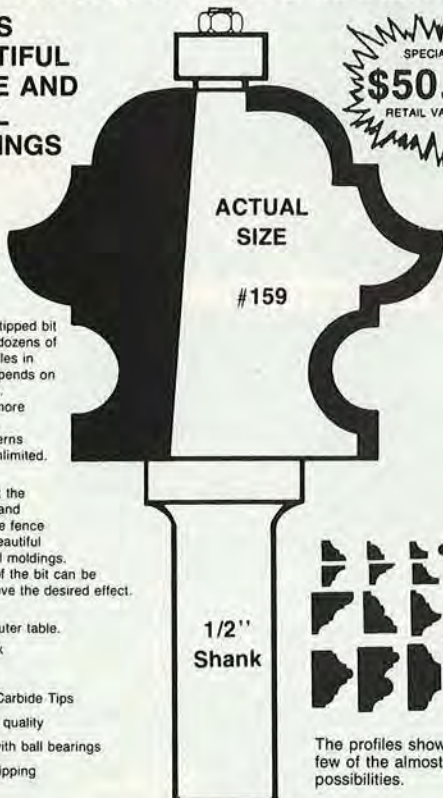
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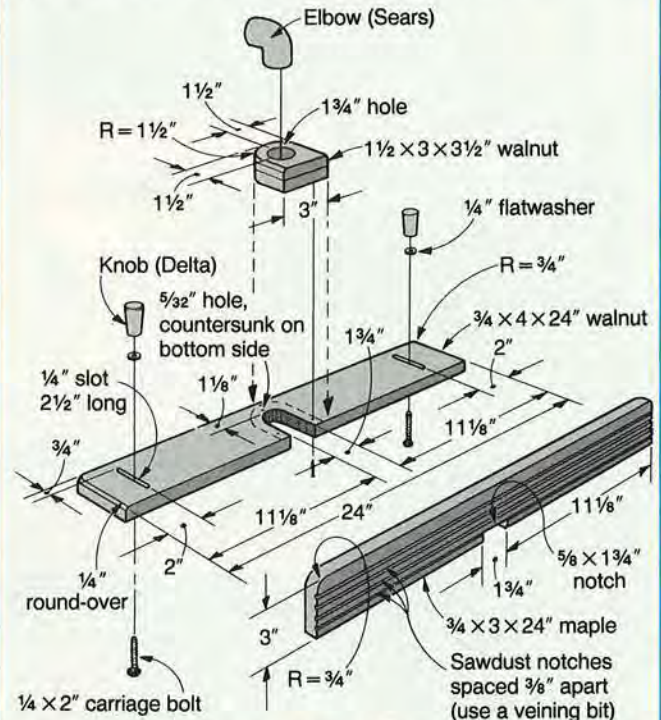
## TALKING BACK

Continued from page 12

### ROUTER TABLE IMPROVEMENTS

Recently I came across an old issue of *WOOD* magazine. I found the cover of the April 1985 issue, which is devoted to a routing table, highly interesting. I departed from some of the instructions and the results pleased me. Your readers may be interested.

First, rather than use clamps to hold the fence in place, I designed and constructed a sliding fence. This change makes precise fence adjustment a snap. The fence attaches to the table with two 1/4 x 20 carriage bolts and Delta table saw fence knobs (part 1087534). I also substituted a Sears elbow (model 315.16960, part 2-725384-00, division 9, source 113) to eliminate a curve in the vacuum hose.



For the tabletop, I chose 1/2" acrylic plastic to increase visibility. Because I didn't want to lose 1/2" of cutting depth, I attached my router to a 3/32" aluminum plate recessed and rabbeted into the table top. Now I can easily pop out the router to change bits.

—Douglas J. Keough, Stroudsburg, Pa.

*Because of fine suggestions such as yours, Doug, our great router table gets even better.*

### STIR UP SOME HOMEMADE PAINT TONIGHT

This is one recipe for milk paint that William H. Mason referred to in his June 1988 "Ask *WOOD*" question. I found the recipe on a 1923 painter's worksheet: Vigorously beat together 1 cup powdered (dry) milk, 1 cup of water, and 2 eggs. Add colored chalk or red iron oxide to desired consistency. Let mixture stand over night. 🌱

—J. Hostetler, Elyria, Ohio

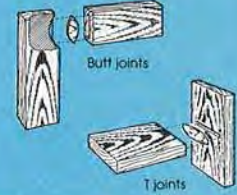
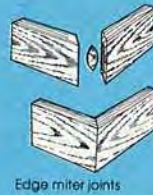
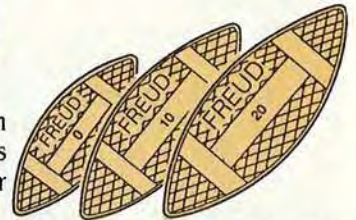


# FREUD'S BISCUIT JOINER: It Works as Easy as 1·2·3



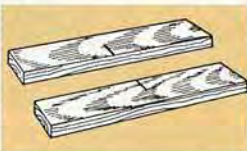
**B**ISCUIT JOINERY is now easy and economical with the Freud Biscuit Joiner machine. Joints, such as butt, edge, "T" and others, can be made quicker and stronger with the use of the Freud joiner.

The Freud joinery machine is a plunge cutting tool. It has a rotating carbide cutter that creates an elliptical slot in the surfaces to be joined. The splines, or "biscuits" as they are called, are inserted into the slot along with any water based glue. Because the biscuits are made of wood, the water makes them swell in the joint making an extremely strong and firm bond.



## 1 Lay Out

The boards that are to be joined should be placed together and the location of each joint marked on both pieces. The vertical fence is adjusted to the depth desired for the slots. Turning the wing nuts on the side



of the fence allows it to move easily in the tracks. The fence is accurately calibrated to allow you to easily move it to center of the joint (See Figure 1).

At this point, you have determined the horizontal location of the joint by marking the wood and vertical location of the joint by setting the fence.

## 2 Cut

You are now ready to make the slots for your biscuit joint.

There is a red indicator line on the front of the fence and a corresponding red mark on the base plate (See Figure 1). You can use either of these marks for alignment with the lines drawn on the mating pieces of wood.

With the wood securely held in place, align the red mark with the line on the board. With one hand you can grasp the body of the machine. The other hand is placed on the handle. Turn the machine on and, with a steady forward motion, push the joiner body forward to make the biscuit slot. Repeat the process for each marked area on all of the wood pieces.

*Simple and Easy!!!* The wood particles are automatically ejected through the machine's exhaust port.

## 3 Assemble

Apply a water based glue to the slots and surfaces being joined. Insert the biscuits in the slots and push the boards together. For best results you will need to clamp the joint together for the glue manufacturer's recommended drying time.

There you have it, 1-2-3!! An extremely strong joint produced quickly and easily by you and the Freud Joiner Machine.

You will find a complete instruction "How to" book with each machine. Illustrated with photographs and drawings, it is designed for those woodworkers not familiar with biscuit joinery. The Freud biscuit joiner will prove to be a highly valued tool for your woodworking projects.

At a List price of \$285.55, the Freud JS100 Joiner Machine is now on sale through your local Freud distributor for \$195.00.

### MITER JOINTS? NO PROBLEM!

By reversing the fence, you can join mitered pieces (See Figure 2). The steps are the same.

Mark the location of your joint and set the fence to the vertical height needed. Line up the fence with the mark and make your cut. Apply glue — insert biscuits — clamp!



### Booklet



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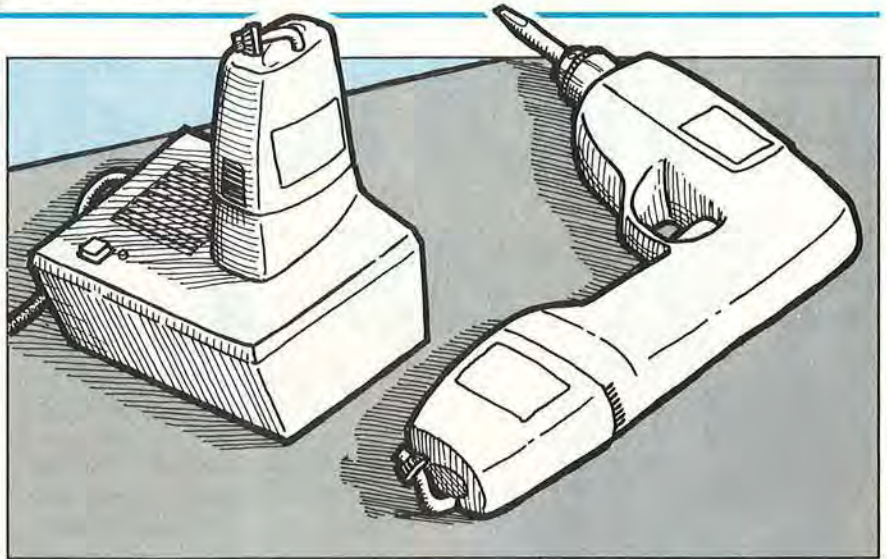
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—Dan Miller, Elgin, Ill.

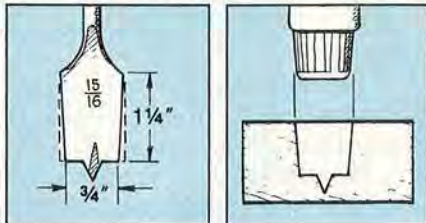


**TAILOR A BIT TO FIT YOUR TAPERED CANDLES**

When boring holes for conventional taper candles 8 to 12" long, a standard spade bit will not produce a snug fit. The holes will be either too large at the bottom, which permits the candle to flop back and forth, or too small for the base to be inserted properly.

**TIP:** Modify a spade bit of the appropriate size— $1\frac{5}{16}$ " matches standard tapered candles. Scribe lines on the bit so it tapers from a  $1\frac{5}{16}$ " diameter to  $\frac{3}{4}$ " as shown below. With a bench grinder, fully remove unwanted material. Finish the cutting edge with a sharpening stone.

—John Wolf, St. Joseph, Mo.



Do you have any good tips you'd like to share with our readers? We'll pay you \$25 for each submission we publish. No shop tips can be returned. Mail your tips to:

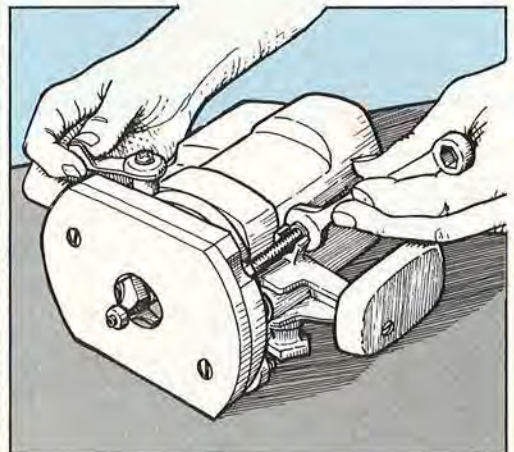
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**TWO TIPS FOR PLUNGING TO PRECISE DEPTHS**

Plunge routers excel in certain operations, such as making signs, cutting dados and rabbets, making hanger holes in the back of plaques, and molding edges. Many of these jobs require precise cutting depths.

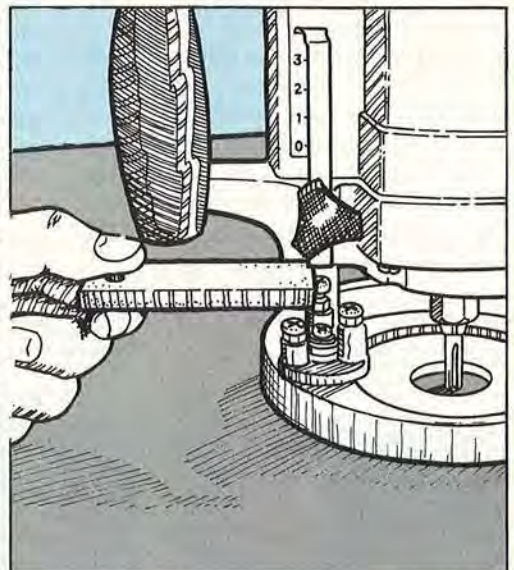
**TIP #1:** To fine-adjust plunge routers with thread-rod depth adjustments for exact depth of cut, plunge the bit slightly deeper (about  $\frac{1}{16}$ " ) than desired and lock into place. Bring down the upper nut on the rod until it comes into contact with the router housing. Now, release the lock and slowly loosen the nut, allowing the router's spring action to lift the bit to the precise depth. Tighten the nut to prevent any vertical movement.

—From the WOOD magazine shop



**TIP #2:** Using the depth gauges on plunge routers often creates an irritating variance in rabbet and dado cuts. Try this remedy: Cut a set of precision shims or gauges made of hardwood, metal, or plastic in common thicknesses such as  $\frac{1}{8}$ ",  $\frac{1}{4}$ ",  $\frac{3}{8}$ ", and so on. A convenient size is  $\frac{3}{4}$ " x 3". Drill a  $\frac{1}{4}$ " hole in one end for hanging and label each block according to its thickness. Use these to preset your router depth consistently as shown at right.

—Eugene Fischer, Houston



Continued on page 18

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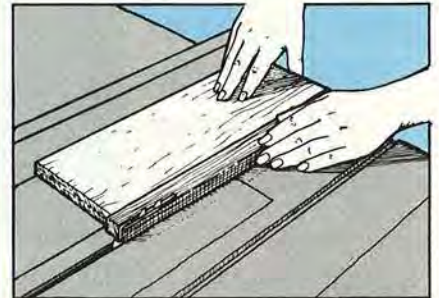
Continued from page 16

### PLAY IT SAFE WITH SHORT, THIN SLICES OF WOOD

Every once in a while, a project calls for narrow wooden strips which you would normally rip from larger pieces of stock. But if you're caught with only small pieces of stock that you need to cut into even smaller dimensions, it may be difficult and hazardous to run them through a table saw.

**TIP:** Use glue to edge-join narrow or short sections of stock to longer and wider sizes of scrap wood (see drawing below) to give you larger work pieces and increase your margin of safety.

—Robert N. Stuckey, Houston



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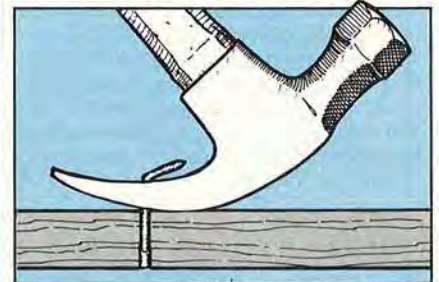
### A GRIPPING IDEA FOR NAIL REMOVAL

You can almost count on the wood splitting when you attempt to pull a finish nail from wood trim or molding you wish to recycle.

**TIP:** Pull these nails through the back side by bending the shank over slightly so your claw hammer can grab it more easily.

Even better, grip the shank of the nail with the jaws of a diagonal wire cutters, slip the hammer claw between the wood and the cutters, and pry out the nail. If any holes remain in the finished face of the molding, fill them with putty.

—Myron S. Levy, Gold Hill, Ore.

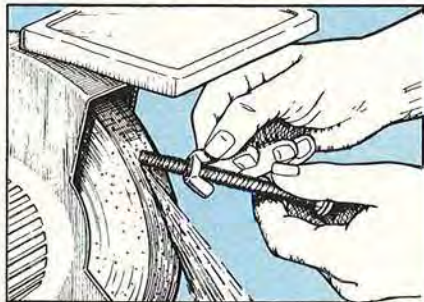


## KEEP THREADS OPEN WHEN CUTTING BOLTS

Occasionally, it's necessary to cut off a bolt that's too long for a specific job. Hacksawing the bolt usually closes the threads, making it very hard—if not impossible—to start the nut.

**TIP:** Thread on a wingnut prior to sawing the bolt, then grind the sawed end on a grinding wheel or belt sander, rotating the bolt 360°. Now the wingnut, which aids in holding the bolt during grinding, will help open the threads completely when spun off. If the wingnut doesn't spin off with little effort, grind the bolt until you can easily remove it.

—From the *WOOD* magazine shop

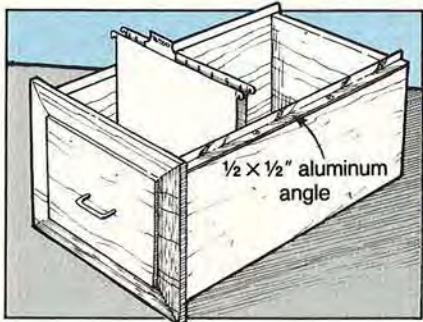


## ON TRACK FOR HANGING FILES

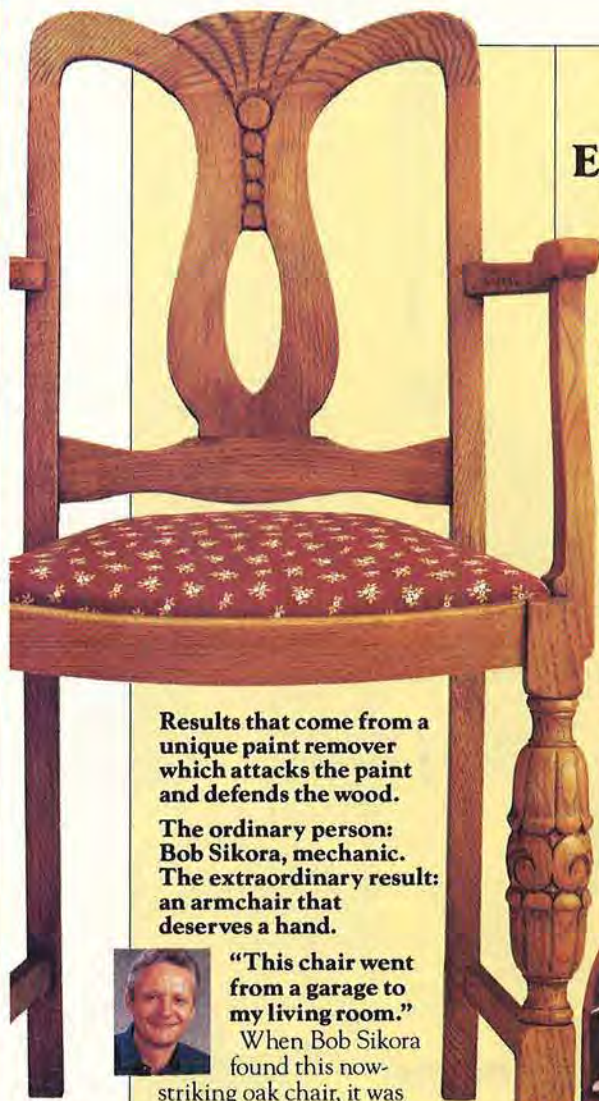
Hanging files keep drawers marvelously organized, but they require a metal frame insert to support them. The insert looks out of place in wooden files you've built yourself.

**TIP:** Mount lengths of  $\frac{1}{2} \times \frac{1}{2}$ " aluminum angle on the top edge of each drawer side, as shown, below. Now, the drawer will support hanging files so you won't need the standard, unattractive racks.

—Craig K. Carlson-Stevemer, Arden Hills, Minn.



Continued on page 20



Results that come from a unique paint remover which attacks the paint and defends the wood.

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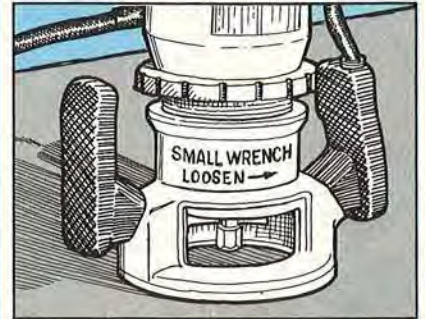
Continued from page 19

### WHEN YOU DON'T KNOW WHICH WAY TO TURN

If you're like us, you may have a devil of a time remembering whether to turn the wrench clockwise or counterclockwise to loosen or tighten the collet that holds router bits.

**TIP:** Label the tightening direction on the router body with a permanent marker so you'll make the right move every time.

—From the WOOD magazine shop

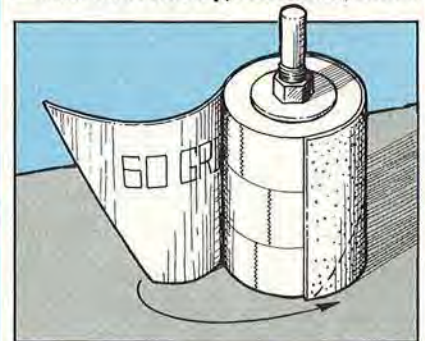


### ONE WAY TO BEAT THE (SANDING) DRUM

Being in the middle of a project and finding out you don't have the right size or grit of sanding sleeves for a drum can be a frustrating experience.

**TIP:** Use double-faced carpet tape to attach the appropriate grade of conventional sandpaper to your sanding drum. First, cover the drum with tape, leaving the protective film on the outside. Cut a strip of sandpaper wide enough to cover the drum, tapering one end at an angle. Fit in place, penciling a line where the ends meet. Cut so the sandpaper ends butt together. Remove the tape's protective strip and affix the sandpaper.

—Thomas P. Rockey, Northfield, Minn.



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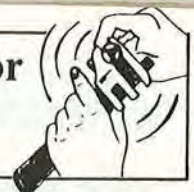
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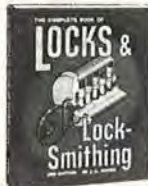
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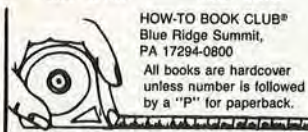


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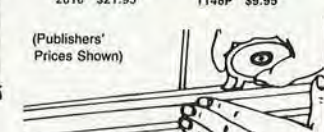
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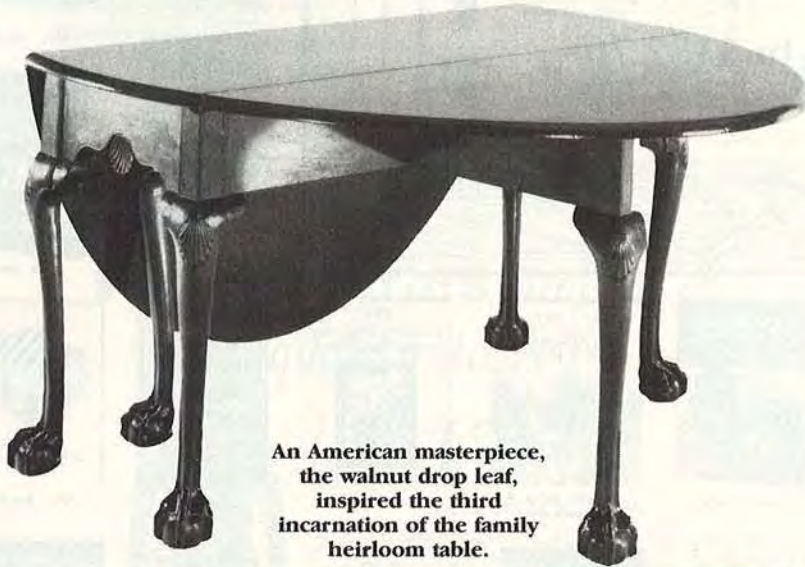


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# THE OLD KITCHEN TABLE

“What a great ax! It’s had two heads, seven handles ...and it’s still going strong!” — Ancient joke



An American masterpiece, the walnut drop leaf, inspired the third incarnation of the family heirloom table.

I grew up convinced that the Pilgrims had their first Thanksgiving dinner on the same walnut tabletop where I ate my cornflakes. “Sure, it’s had some repairs,” said my mother, “but this old table has been in our family since 1627.” It wasn’t until adulthood, when the table had passed down to me, that I first suspected the integrity of our cherished family tradition. Unless history recorded a hingemaker named *Stanley* on the Mayflower, something was incredibly wrong with our heirloom drop-leaf table.

**The pine tree and the trestle**  
Through careful research (and a heavy dose of imagination), I have solved the mystery of our family heirloom. Our walnut drop-leaf table did actually begin in 1627—but as a pine trestle table!

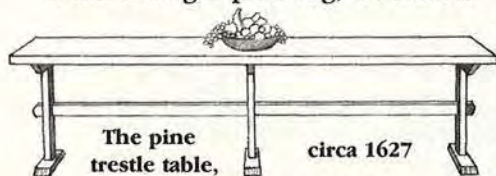
In the beginning, it measured 2’ wide and 12’ long, just large

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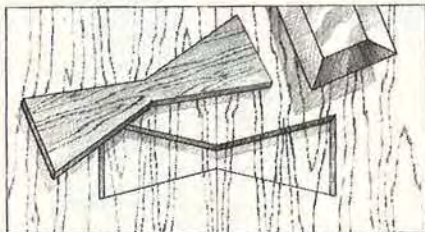


enough for family and friends. The two massive top planks were split from a single pine log, smoothed



with an adz and plane, then joined along their underside with wooden dovetails, like the one shown.

After joining and gluing the tabletop boards, carved, butterfly-



"Butterfly" dovetails

shaped pieces of wood were set across the seam and their outlines carefully traced with a knife. Then the recesses were chiseled out and the dovetails glued into place.

### The drunkard, the drop leaf, and the restoration

Our family table underwent its first major renovation, at the hands of its third owner, just after the American Revolution. An old soldier, beset with the fever, had taken the "two-hat cure"—he put his hat on the table and drank apple brandy until he saw two hats!

Unfortunately, during the curative stupor, his candle burned through the tabletop. But, the old soldier had the right replacement: three walnut boards won in a horse race. Shortening the stretchers, he made it into a large card table.

As often happens, however, the wood used by the old soldier was

better than the craftsmanship. This, coupled with the odd match of the walnut top and the pine trestle base, motivated the table's seventh owner to have it restored as genuine "Colonial" table.

This happened when the centennial of 1876 was fast approaching. The local cabinetmaker chopped up the pine base for kindling, replacing it with a proper one of carved walnut with swing-out, knuckle-jointed side legs.

Cutting the knuckle joints was easier than it looked. With chisels and planes, the cabinetmaker shaped the ends of the two boards into partial cylinders. He then cut away the alternating sections from each cylinder to allow them to intermesh. Iron rods through their centers completed the wooden hinges. The length of the knuckle joints gave stability to the swing-out legs that supported the drop

*Continued*

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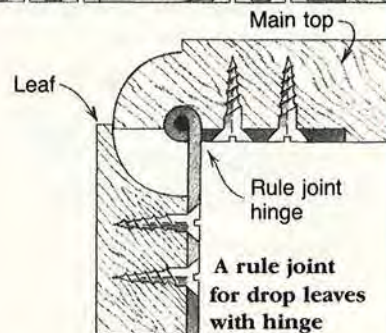
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## OLD HAND WAYS

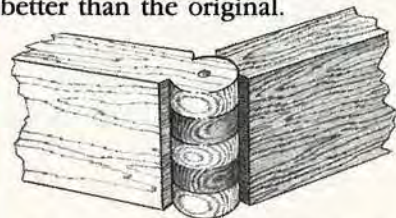
Continued from page 23

leaves he recut from the "original" walnut table top.

The cabinetmaker joined the drop leaves with rule joints—so-called because of their resemblance to a folding ruler. They were ideal because the main top supports any load on the leaf.



Hinges made for rule joints differ from common ones. They have countersunk screwholes on the opposite side from the raised hinge knuckle. Shaping the hollow and round elements of the rule joint with his two molding planes, he knew that the table was better than the original.



A knuckle joint for swing-out legs

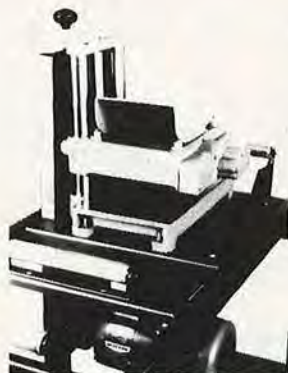
Finally, the table came down to me with not an original piece in it. I am still very proud, though, of my walnut, drop-leaf table that began as a pine tree. 🌲



**By Roy Underhill**  
Master housewright at Colonial Williamsburg in Virginia and host of the popular PBS series *The Woodwright's Shop*, Underhill is also an author and lecturer.

Photograph: Courtesy Colonial Williamsburg  
Illustrations: Jim Stevenson

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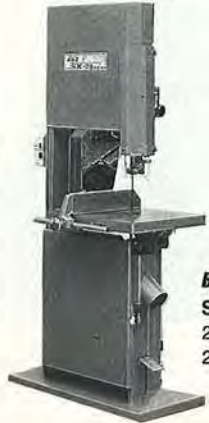
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# MAKING A GOOD LATHE EVEN BETTER

**O**ur shop-built lathe, featured in the April 1987 issue of *WOOD* magazine, has proven to be popular.

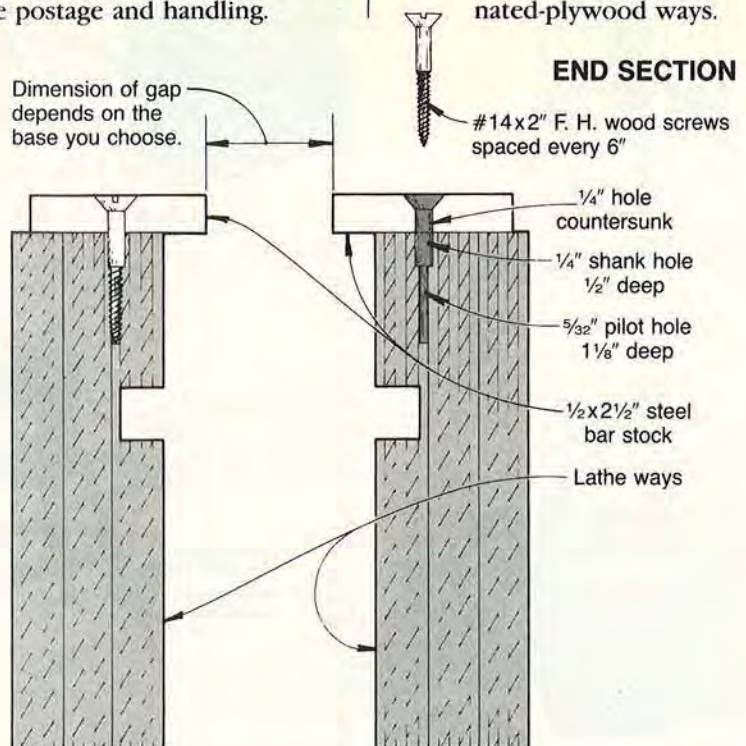
In addition to the original model here in our shop, we've had people on staff build them for their personal workshops. And, according to our suppliers, more than 200 readers have ordered the parts to build their own.

After many hours of use, we found our homemade tool rest wasn't as easy to use as most commercial models. Striving for improvement, we ordered several tool rests and bases, and tried them on our lathe.

Which is the best? It's hard to say. Each performed well (admittedly better than our homemade version), so we decided to show you the four we tested, and let you choose the best system for your needs. The prices listed include postage and handling.



We added  $\frac{1}{2} \times 2\frac{1}{2} \times 64$ " steel strips to the top of the ways for three of the tool-rest bases to track on. The steel and cutting cost us \$25 at a local machine shop. The fourth base, made by Conover, tracks on the wooden ways of the lathe as designed. The drawing *below* shows the steel strips screwed to the laminated-plywood ways.



Continued on page 28



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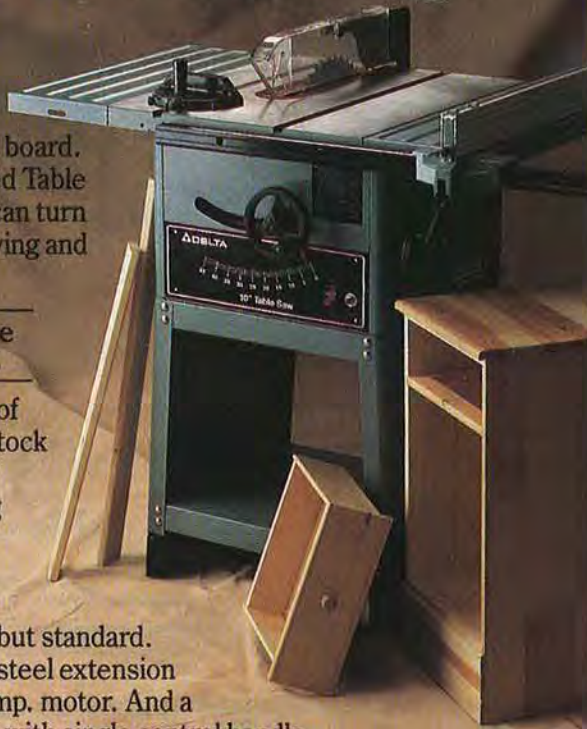
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## LATHE

Continued from page 26

### PICK THE TOOL REST AND BASE THAT BEST FIT YOUR NEEDS

At the low end of the price spectrum, the Rockwell standard base (no. 46-831) retails for \$42. Both this unit and the deluxe Rockwell base require a custom-made height-adjustment adapter (\$25). The adjustment adapter is available only from the source listed below. The 12"-long rest (no. 46-692) sells for \$15, a 4" rest (46-690), \$13; and an outside French curl (no. 46-405), \$13. The gap between the steel strips measures 1 5/8" for both this base and the Deluxe model listed below. Our source: Puckett Electric, 1011 Keo Way, Des Moines, IA 50309; 800-544-4189.



Standard Rockwell Tool-Rest Base

Sturdier and more expensive, the Rockwell deluxe tool-rest base (no. 46-171) shown below retails for \$105. The attachments mentioned above for the standard base also fit this model. From Puckett Electric, address and phone number listed above.



Deluxe Rockwell Tool-Rest Base

Continued on page 30

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6012HDW	1/4" cordless clutch drill	\$109
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Optional Bits in Stock

# LATHE

Continued from page 28

Bowl turners will love General's extended base. It's 13 1/2"-length makes reaching the outside of a large bowl a breeze. The S-curve bowl rest shown *below*, makes turning the curved surfaces of bowls easier with less chatter. The rest allows you to support your turning tool next to the curved surface—something not always obtainable with a straight rest. The G-264 base sells for \$109 and the S-curve rest (BR500) with 5" shaft sells for \$47. The gap between the steel strips measures 1 7/8". Craft Supplies, 1287 E. 1120 S., Provo, UT 84601; 801/373-0917.



General's Extended Tool-Rest Base

The Conover tool-rest base shown *below* mounts to the ways without adding the steel strips. (Our lathe already had the strips permanently attached before we took the picture.) The base (CL16-300), which sells for \$75, tightens to the ways by the use of a handwheel located below the ways. The 12" rest (CL16-306, shown in the photo) sells for \$26. The 6" (CL16-307) rest sells for \$24 from Conover Woodcraft Specialties, 18125 Madison Rd., Parkman, OH 44080; 216/548-3481.



Conover Tool-Rest Base

Photographs: Bob Calmer

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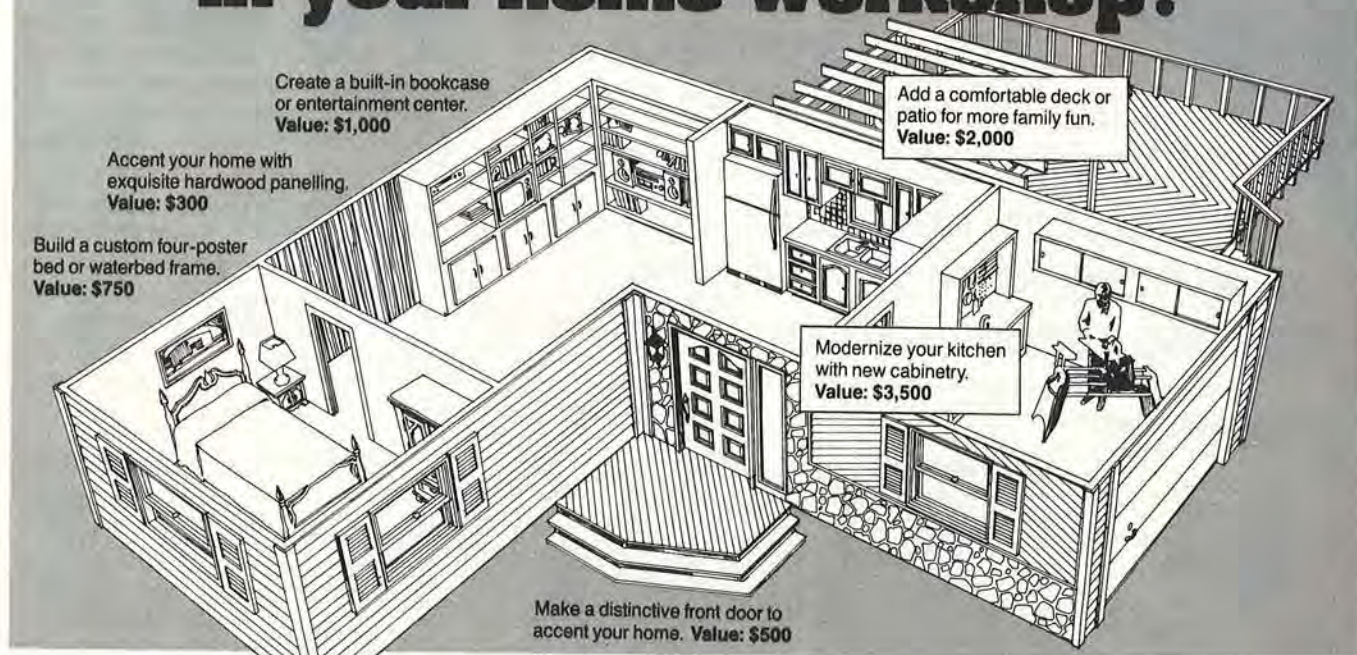
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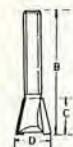


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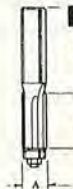
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S130	1	\$20
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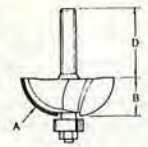
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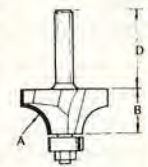
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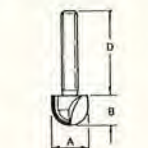
PART NO.	A	PRICE
S702Y	1/16	\$11
S704Y	1/8	\$11
S706Y	3/16	\$11
S708Y	1/4	\$12
S710Y	5/16	\$12
S712Y	3/8	\$12
S716Y	1/2	\$13
*S716Y 1/2	1/2	\$14

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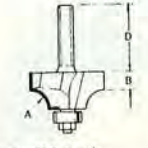
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S516Y	1/2R	\$15
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*S524Y 1/2	3/4R	\$18
*S528Y 1/2	7/8R	\$30
*S532Y 1/2	1R	\$30
*S536Y 1/2	1-1/4R	\$38

**Core Box**



PART NO.	A	PRICE
S408	1/4	\$9
S412	3/8	\$10
S416	1/2	\$11
S420	5/8	\$12
S424	3/4	\$14
*S424 1/2	3/4	\$14
*S432 1/2	1	\$15

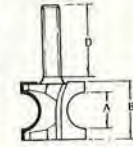
**Beading**



PART NO.	A	PRICE
S602Y	1/16R	\$11
S604Y	1/8R	\$11
S606Y	3/16R	\$11
S608Y	1/4R	\$12
S610Y	5/16R	\$13
S612Y	3/8R	\$15
S616Y	1/2R	\$15
*S616Y 1/2	1/2R	\$15
*S624Y 1/2	3/4R	\$18

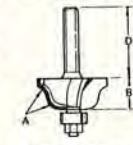
\*Indicates 1/2" shank.

**Bull Nose**



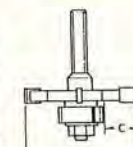
PART NO.	A	PRICE
SY9-1	1/4	\$12
*SY9-1 1/2	1/4	\$12
SY9-3	3/8	\$14
*SY9-3 1/2	3/8	\$14
SY9-4	1/2	\$14
*SY9-4 1/2	1/2	\$14
SY9-5	5/8	\$15
*SY9-5 1/2	5/8	\$15
SY9-6	3/4	\$15
*SY9-6 1/2	3/4	\$15
*SY9-8 1/2	1	\$17
*SY9-9 1/2	1-1/8	\$25
*SY9-10 1/2	1-1/4	\$30
*SY9-11 1/2	1-1/2	\$38

**Roman Ogee**



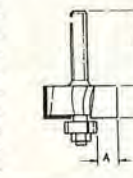
PART NO.	A	PRICE
S5705Y	5/32	\$15
*S5705Y 1/2	5/32	\$15
S5708Y	1/4	\$16
*S5708Y 1/2	1/4	\$16

**Slot Cutter - 4 Flutes**



PART NO.	A	PRICE
SY7002	1/8	\$20
*SY7002 1/2	1/8	\$20
SY7004	5/32" (4mm)	\$20
*SY7004 1/2	5/32" (4mm)	\$20
SY7006	3/16	\$20
*SY7006 1/2	3/16	\$20
SY7008	1/4	\$20
*SY7008 1/2	1/4	\$20

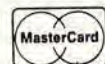
**Slot Cutters/  
Rabbeting Bit**



PART NO.	B	PRICE
S1702Y	1/16	\$10
S1704Y	1/8	\$10
*S1704Y 1/2	1/8	\$10
S1706Y	1/4	\$11
*S1706Y 1/2	1/4	\$11
S1708Y	3/8	\$11
*S1708Y 1/2	3/8	\$11
S1712Y	1/2	\$12
*S1712Y 1/2	1/2	\$12



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**N**ative Americans turned the bounty of the land into the essentials of life. The tree that the Narragansett Indians called *sasauaka-pamuch* was no exception. Long before European explorers landed on the continent, the tree yielded its roots, bark, and leaves for a medicinal brew believed to cure everything from sore eyes to diarrhea.

Colonists coined the word sassafras from the Indian's language. And from the tree's healing properties, they coined profits from export. Sassafras tea was touted across the ocean as a tonic to "thin the blood and purify the system."

To those pioneers who used the wood, sassafras became well known as long lasting. Because it resists rot in contact with the ground, farmers sunk it for fence posts and split it for rails. Since it was light and absorbed little water, sassafras also was ideally suited for canoes and cooperage.

In the woodshop, sassafras often becomes a substitute for chestnut. It also resembles ash, and mixes well with it in furniture manufacturing.

### Wood identification

Ancestors of sassafras (*Sassafras albidum*), a truly American species, grew across the continent during early geologic periods. Now, it's found from southern Maine south to central Florida and west to the Mississippi River Valley and eastern Texas.

# SASSAFRAS

## The look-alike wood better known as tea



Sassafras

In its northern range, sassafras rarely grows larger than shrub-size. But in favorable conditions in North Carolina and Tennessee, sassafras trees may reach 5' in diameter, 100' tall, and live 1,000 years.

Sassafras rarely grows in stands. Instead, it mixes with white oak, persimmon, and sweet gum. You can pick it out by its normally flat-topped crown or twisted branches sticking straight out from the trunk. Old trees have deeply furrowed, reddish-brown bark with flattened ridges, and appear as if

they had been washed with light gray. The bark of young trees looks reddish, but has cracks instead of furrows.

Sassafras leaves are a dead giveaway—they have three long lobes, often misshapen, and varying in size, even on the same branch. If you have any doubt, sniff. All parts of the tree have a pleasant, medicinal odor.

Although its coarse grain mimics ash or chestnut, sassafras wood weighs less. Dry, it weighs only about 30 lbs. per cubic foot. Wood from older trees has a red-brown color; from

younger ones, a yellow-tan. There's little color difference between heartwood and sapwood.

### Working properties

A soft hardwood, sassafras works easily with only hand tools. Planing, however, requires care so you don't lift the grain. And, you'll find the wood brittle and not very strong, characteristics that demand glue when joining. Fasteners alone won't hold in the wood.

Sanding sassafras poses no problem. It takes a fine finish.

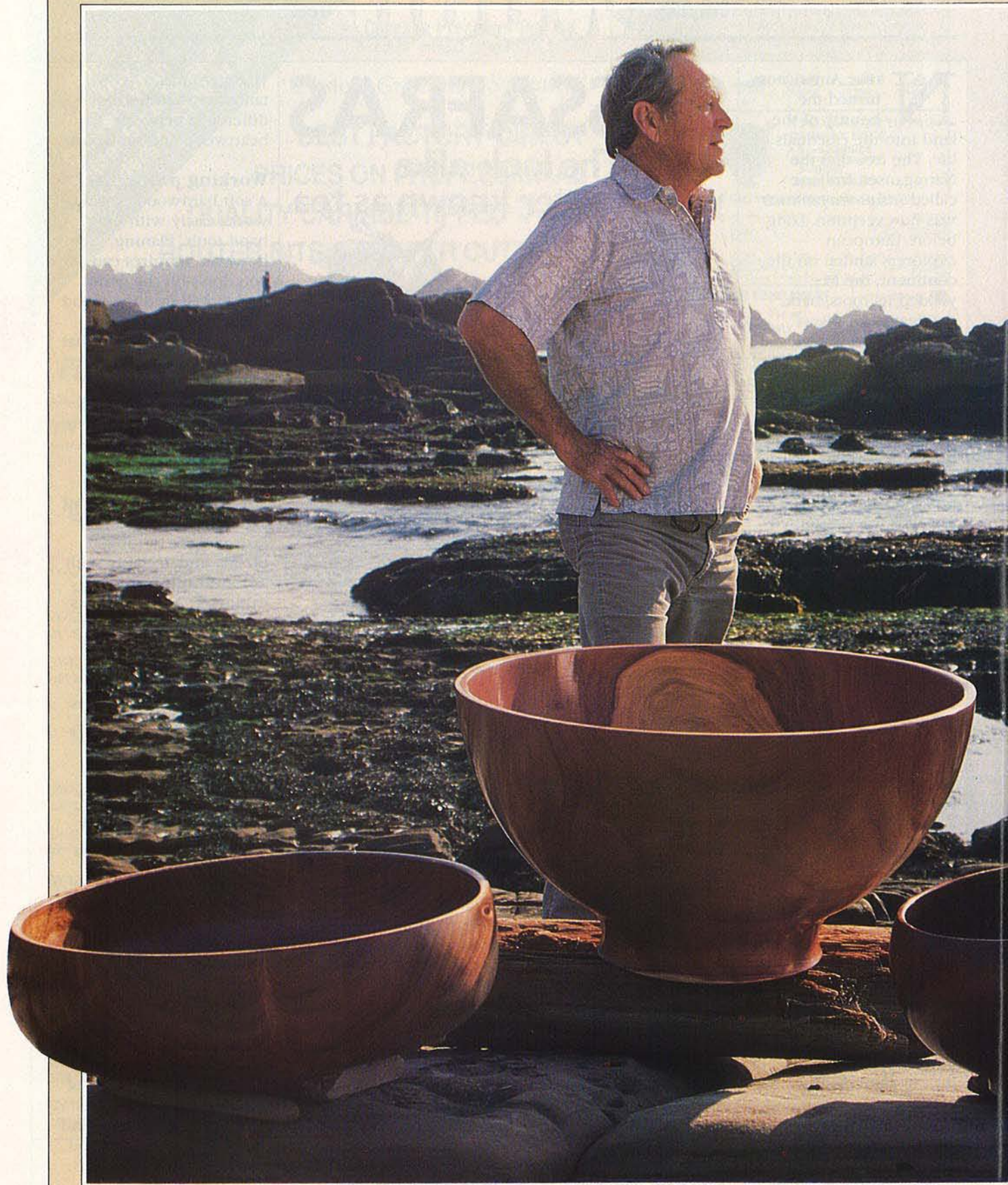
### Uses in woodworking

When not required to bear weight, sassafras blends undetectably with ash in furniture and cabinetry. And due to its likeness to chestnut, the wood often imitates the long-lost classic in antique reproductions. Woodturners and carvers with sharp tools easily work sassafras' unusual grain patterns into eye-catching pieces.

### Cost and availability

The occasional sassafras sold by hardwood lumber outlets costs about \$1.75 per board foot. It rarely will be more than 1" thick and wider than 8". When mixed and sold with ash, it carries a higher price. To be sure what you're buying, scrape or abrade a fresh surface to release the unmistakable odor of sassafras in the wood. Very seldom will you find sassafras sold as plywood or veneer. 🌳

Illustrations: Steve Schindler  
Photograph: Bob Calmer



# TURNINGS

## BY THE SEA

With a view of Point Lobos and the Pacific beyond, California turner Neil Weston turns gargantuan bowls on his humongous lathe.

To photo buffs, the Weston name stimulates images of natural forms defined by the effects of changing, controlled light. Edward Weston was a photographer challenged by his environment—seashells strewn with kelp, twisted cypress roots on Point Lobos, endless sand dunes, and even garden-variety green peppers. In the thirties and forties, he recorded such scenes forever on film.

Neil Weston learned photography from his father. But, unlike his brothers, he chose not to pursue it. "I didn't like being couped up inside with chemicals," he remembers. "I was out building boats or sailing them, even as a boy." Boatbuilding actually introduced Neil to woodturning. When he turned all the belaying pins for one of his sailboats, he planted the seed that would sprout years later. As it happened, it wasn't until about eight years ago that Neil seriously began turning.

### SKILLS LEARNED IN PARADISE

A move made in 1981 for family health reasons took Neil and his wife, Ann, from the damp, cool Carmel climate to the big island of Hawaii. There, Neil finished his brother Brett's home, and he and Ann fell in love with the paradise: "We said, 'What the heck!' and decided to live there, too."

So, Neil built another home, where they resided for four years before returning to Carmel.

◀ Named after photographer Edward Weston, Carmel's Weston Beach backdrops Neil and his turnings.

Creativity just comes naturally to 70-year-old Neil Weston. His father, photographer Edward Weston, was at the forefront of the art world in the 1930s. Neil's brothers, Brett and Cole, took up the camera, too, and now have worldwide reputations. Neil's creativity, however, flowed from his hands through wood—first into sailboats he designed and built, then into housing. Now, at an age when most folks settle down to good books and golf at Pebble Beach, Neil pours himself and his talent into turning wood in a big way.



Neil Weston

At his secluded Carmel, California, home Neil turns huge bowls from native stock. He stalks wood along the rugged coast and in the nearby hills, saws it up, and turns it green on one of the most unusual lathes we have ever seen. Neil says he still has a lot to learn, but what he shared impressed us.

When they did, Neil carried a serious bite by the turning bug back to California.

"In Hawaii, I had watched a professional turner a few times and became fascinated. That was enough to make me want to get into it," Neil says. "But, I had to teach myself how to turn—and did—with the help of Dale Nish's books. I started with big bowls right off."

Neil makes no apologies for relying on a roundnose chisel for most of his finish-turning. "A shearing-type gouge is real tricky to use without any instruction, so I just got into scraping. I should use a shearing tool to smooth the wood more, but it's hard to teach an old dog new tricks," he says. "I do use a gouge, though, to rough out the bowl. When it gets down to the final finish, I find it more comfortable to scrape—with a light touch!"

In Hawaii, Neil learned more than how to use a lathe. He discovered how to buy wood for a pittance, turn it green, and dry it rough-turned.

Even now, past Hawaiian bargains represented by stacks of sealed, rough-turned bowls load up several shelves in his workshop. "That's *jenisero*," Neil explains. "It's a South American hardwood that naturalized in Hawaii. There, it grows into huge trees. I bought a whole pickup load of it from a wood wrecker—that's someone who removes trees—for \$5 a chunk. What a deal that was! It's all dated 1982, when I rough-turned it. Because we lived in a desert area, I painted the bowls with latex paint to slow down the drying time."

Continued

# TURNINGS BY THE SEA

In addition to the jenisero, Neil brought back 200 rough-turned koa bowls and an entire koa log.

Now Neil focuses on local hardwoods. "Mark, my son, is in tree removal," Neil explains. "He's alerted others in the wood-removal business here to keep their eyes open for trees that would make likely turning prospects for me, such as large-diameter, solid wood."

## MYRTLE, REDWOOD, AND ROQUEFORT CHEESE

Neil focuses on acacia, alder, bay laurel (myrtle), English and black walnut, and redwood. Plus, he trades some wood with other turners around the country.

Frequently, Neil goes right to a job site where his son has dropped a tree for a firsthand look at the wood. If he salvages it, the log ends up next to his workshop. "The sooner you can get a chunk of the tree on the lathe after it's cut down, the better," Neil says. "Otherwise, it starts to shrink as it dries out. But, I can't always do that. To protect the log—to keep it from cracking, checking, and drying—I put it in the shade, coat the ends with paint, and cover it with sheets of plywood until I can get to it. Never cover a log with clear plastic. It will burn out."

Local alder ranks among Neil's favorite turning woods. There's a handy supply, and he's learned to enhance the appearance. "I harvest alder in a canyon about six miles down the coast. And with some time and effort, I get it to spalt," he says. "It's like making Roquefort cheese."

Neil starts with a live tree ("I've found that a dead tree won't spalt") that he drops and cuts into logs 3' to 4' long. Instead of sealing the ends, he leaves them open so plenty of moisture enters the wood. "The fungus gets in, too, and it starts to go! I even take shavings from pieces of spalted

wood and sprinkle them on the logs. It's like infecting them," he says. "I set the logs on the north side of my shop, spray water on them occasionally to keep them relatively green, and in six months to a year, I've got spalted alder."

## MEET J. B. HUMONGOUS

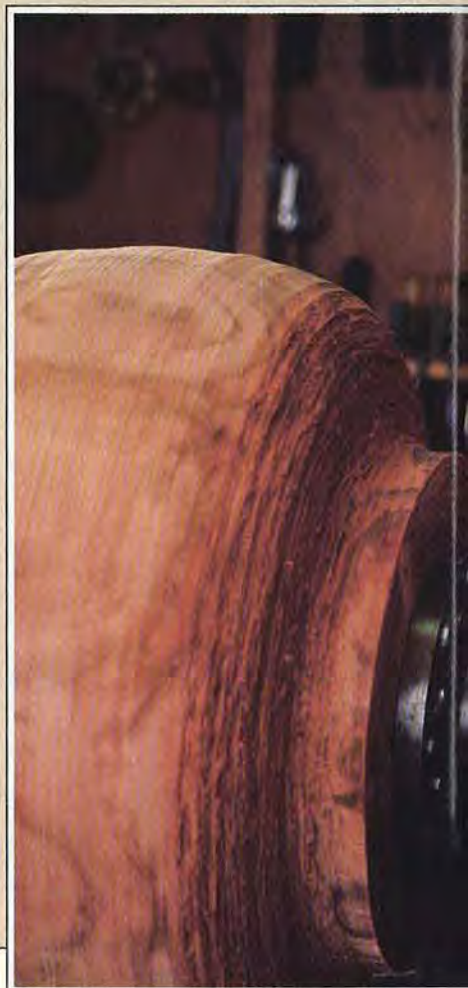
When Neil got serious about bowl turning, he went at it in a big way. His outboard lathe, named "J. B. Humongous" after its builder, Jerry Blanchard, and its size, has an 8' swing with the toolrest removed.

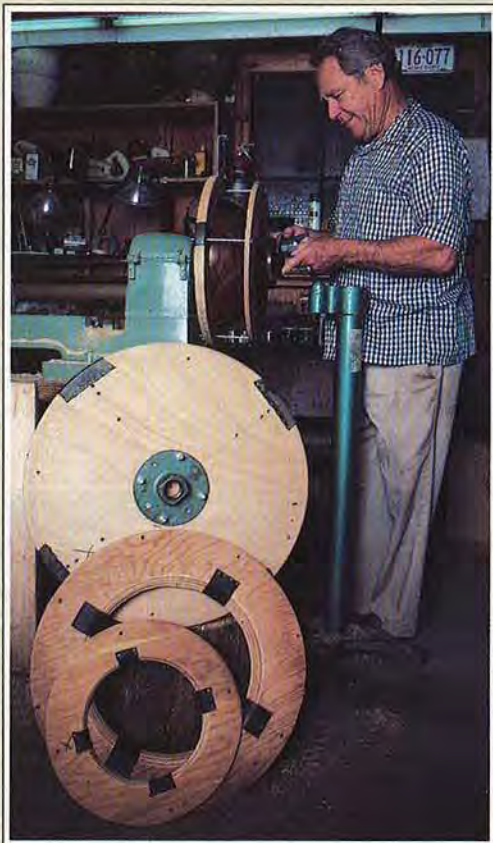
Powered by a 2-hp., 220-volt motor meshed with two side-by-side automotive transmissions, Humongous provides Neil with 13 speeds from 33 rpm to 856 rpm, plus a slow speed—actually a reverse—for final sanding. It's bolted to the concrete floor for less vibration, and

Neil and his son, Mark, check out ►  
downed redwood logs that could end up as bowls in a gallery.



▲ A block and tackle is a standard tool when 150-pound bowl blanks aren't uncommon around the shop.





## THE FINAL FINISH

After final shaping of the bowl some six months later, Neil sands the work while it's still mounted to the faceplate. Next, he applies a slow-dry epoxy. After curing overnight, the bowl can be rubbed with 0000 steel wool to remove the high gloss. A buffing with flannel readies the work for the last bit of turning to craft the bottom rim. Neil likes to think of the distinctive addition as his personal signature.

"I read an article about how this turner shaped the bottom of his bowls," explains Neil. "It fired me up to try something like it myself." Neil tried, then perfected, the technique that gives his bowls a double-duty, liplike base. Creating the base ridges the bottom of the faceplate screw holes, and attractively

raises the bowl from any display surface. "If you finish the rest of the bowl first," Neil adds, "all you have to do is turn the bottom, finish that part, and you're done. It's great!"

Neil turns the base of the unfinished bowl with the help of a two-piece jig, photo *above*. He first chucks the 1½" thick, circular plywood mounting plate (one of three in various diameters for different-size bowls) into the headstock. Then, Neil centers the bowl, base out, on the plate and fits it with a collet of ¾" plywood.

To make sure he doesn't burst through the bowl bottom with his turning tool, Neil notes the bowl's inside depth so he knows exactly how deep to shape the recess in the base. After shaping the recess and base lip, and some sanding, Neil finishes the bottom to match.

For a final touch, Neil glues a personalized silver medallion to the base of his bowls. The motif reflects his past and present—a ship's anchor encircled by the words "Weston, Hawaii and Carmel." 🍵

Written by Peter J. Stephano  
Photographs: Jim Elder



▲ A base and collet of plywood hold the inverted, finished bowl for the final turning of the recessed, lip-shaped bowl base that marks Neil's work.

◀ The lathe's 8' swing hasn't been tested as yet, but Neil has turned bowls 28" in diameter. He can choose from 13 forward speeds and a reverse.

angled so that a fan blows turning dust right out the door.

"That lathe can swing really big stuff because it's built sturdy and geared low enough to handle it, but so far I've only turned a bowl about 28" in diameter," Neil points out. "That chunk of wood, though, weighed 500 pounds, and I had to use a block and tackle to hoist it up and get it mounted."

Once Neil mounts a block on his Humongous, he turns it down to a wall thickness of ½" to 1½", depending on the size of the bowl. Then, he sets it aside to dry for six months or so after marking its rough-turned circumference. The notation helps him keep track of different woods' stability. Depending on the species, some wood will dry out of round by as much as ¼", others only ⅛".

# CRAFTSMANSHIP BY THE CARLOAD

THOMASVILLE INDUSTRIES TURNS OUT \$1 MILLION  
IN HIGH-QUALITY FURNITURE EVERY DAY



**I**n the town square at Thomasville, North Carolina stands a 30'-high Duncan Phyfe-style chair. In bustling Thomasville, chairs are big. So are tables, bedroom sets, china hutches, and other distinctive furniture pieces. Every working day, more than \$1 million worth of furniture rolls off the assembly lines of Thomasville Furniture Industries.

What do a modern-day furniture plant and a home woodworker's shop have in common? Recently we visited Thomasville for a couple of days to find out.

We discovered that Thomasville's plants aren't as highly automated as we expected. There are conveyor belts and mega-machines, to be sure, but here, crafting furniture—from grading veneers to rubbing out remains a hands-on operation. The company's 6,000-plus employees take pride in a tradition of craftsmanship that goes back to 1904 when the original Thomasville Chair Company was founded.

## FURNITURE IS FASHION

One reason why Thomasville has no intention of turning its plants over to robots and computers lies

with the volatile furniture industry. For a week each spring and fall, retailers flock to Thomasville and nearby High Point to check out the latest styles and place orders for the furniture you'll eventually see in stores. One season Queen Anne might be a hot seller; buyers could bet heavily on country contemporary six months later. "Ours is very much a fashion-oriented business," observes Thomasville president Frederick B. Starr. "To keep up with changes in home fashion, we introduce about 100 pieces each year, and then adjust production as orders come in."





*Far left:* A Thomasville Furniture craftsman carefully carves a new chair-leg pattern from mahogany stock. When the pattern meets approval, a metal cast will be made for the factory.

*Left:* The routers on this machine simultaneously duplicate 24 table legs.

devours about a million board feet of lumber and 2.5 million feet of veneer each week.

### PEOPLE POWER

In 1987, Thomasville invested more than \$10 million in new equipment. The materials budget—primarily veneer and hardwood—soars even higher. The annual sandpaper budget alone adds up to a whopping \$2.5 million. But materials and machinery tell only part of the story. “Our greatest assets,” says president Starr, “are our workers. People at Thomasville do their jobs right the first time.”

Lots of men and women join the company just after completing high school and remain until they retire 45 or more years later. Why? Part of the answer lies with the quality of everyday life in North Carolina’s hills and hollows. The winters are mild, the hunting good, and the fishing even better. With a job or jobs at Thomasville Furniture, a family can also farm a few acres and remain close to the land.

But on-the-job satisfaction means a lot, too, as any home woodworker could guess. At Thomasville the number of pieces produced are big, but workers know that their skilled craftsmanship still counts more.

### CARVINGS BEGIN WITH A MASTER CARVER

We’ve often wondered how chair or table legs can look so highly detailed, yet each matches perfectly with its mate. We found the answer to this question in Thomasville’s Service Plant E. This plant supplies millions of carved bedposts, table and chair legs, headboards and more to the production plants. Here, one of the master carvers—who has been carving since he was four years old—painstakingly hand-tools a mahogany bedpost that will serve as a pattern for multiple-spindle carving machines similar to the one shown *above*. In the factory,

A new line of furniture begins in the design department with thumbnail sketches, renderings, and working drawings. Finally, Thomasville craftsmen handcraft a prototype. At this point, the piece is one of a kind, much like a project from any woodworker’s shop.

But from then on, the prototype runs a gauntlet no amateur design has to endure. First, it goes to product engineering, where costs, dimensions, and joinery are carefully analyzed. Next, the prototype moves to a tough workout in the Physical and Chemical Testing Laboratory. One machine simulates a

200-pound man rocking the piece 10,000 times to ensure sound joinery. Another machine subjects the prototype to extremes of temperature and humidity.

Finally, after a new design passes all its tests, it’s assigned to one of Thomasville’s 11 production plants sprinkled throughout hilly northern North Carolina and southern Virginia. Ten additional service plants feed the production plants with lumber, veneer, carvings, and other components.

As you might imagine, 11 production plants create a tremendous appetite for materials. Thomasville



At his bench, a Thomasville master carver adds detail to a bed post.

routers arranged in pantograph-fashion can simultaneously carve 24 table legs, for example.

### VENEER BY THE MILE

Veneer salesmen, familiar faces among the area furniture companies, travel the highways pulling trailers of veneer samples behind their cars. On the day we visited, a salesman laid out a forest of samples—one veneered log at a time—for Thomasville buyers at plant V. In less than an hour, the buyers purchased dozens of trees after examining three veneer samples from each log—a slice from the top of the log, one from the middle, and another from the bottom. Later, the salesman packed up the rejects to peddle to other furniture factories.

Thomasville primarily purchases  $\frac{1}{28}$ "-thick sliced veneer. Other species include pecan, hickory, cherry, oak, Carpathian elm burl, and olive ash burl. Workers processed more than 100 million surface feet of veneer last year.

To maintain an 8–10 percent moisture content, veneer flitches, as the sliced logs are called, go into storage areas where the temperature remains between 72 and 78 degrees Fahrenheit and the relative humidity at 35 percent.

Workers with trained eyes and skilled hands then match the flitches and pressure-tape them together into panels used to surface table tops, cabinets, headboards, and other case goods.

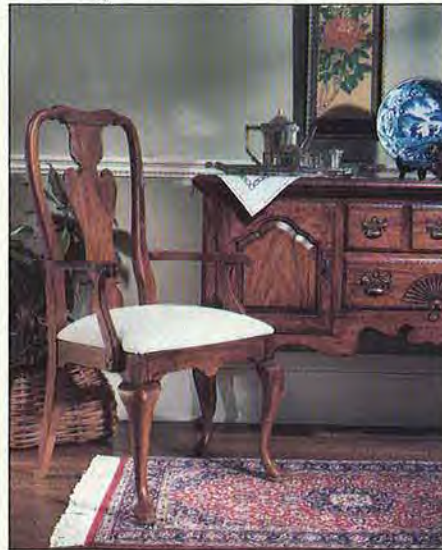
How do a furniture- and your home-production shop compare? Plenty of ways. Both place a premium on the quality of the finished product. And neither shop would undertake a shortcut that could lead to anything less than the finest possible piece of furniture.



Assembling an intricate veneer pattern can require up to 80 separate steps.

## THE BIRTH OF

Plant C, Thomasville's largest facility, produces more than 800 chairs during every eight-hour shift. To show you how they do it, we followed a Queen Anne chair, *below*, along the assembly line.



Doweling takes a two-step operation. One machine drills the holes, and another, shown *below*, injects glue into the holes and drives the dowels. The doweling occurs almost as fast as the operator can position the pieces. Later, these pieces will tie together the back posts at seat level.



# A CHAIR IN CHAIR CITY



Our chair begins at a series of band saws, where workers cut some of its various components from rough stock. Here, Angela Miller saws chair back posts on a machine that has a 48-inch throat. A pattern jig ensures that each piece will be identical.



Pecan chair legs, enough to seat a state dinner, roll down the production line to a team of workers who form round-overs on a double-spindle shaper. After shaping the leg, the parts are stacked onto a cart and wheeled to the sanding area.



Now, the chair-back posts get a good sanding. This brush sander uses 120-grit  $\frac{1}{4}$ "-thick scored cloth sandpaper. Fingerless gloves and fingertip caps protect workers' hands and still allow the operators to get a good feel for the job they're doing.

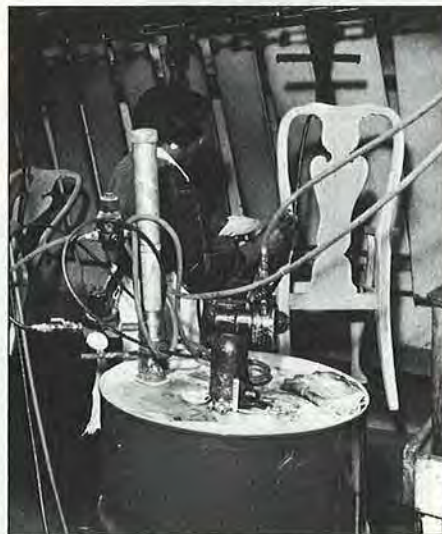
Finally, our chair begins to look like a Queen Anne chair. One worker hand-assembles the back components, which will then be clamped in the machine to her right. Workers in the background immediately scrape off the excess glue, and apply filler where necessary to the joints.



More hand assembly completes the Thomasville chair frame. This pneumatically powered machine can clamp 100 chairs an hour. After assembling each frame, the chair gets a ride on an overhead conveyer until the glue dries. Then, an inspector rigorously tests all the chair joints.

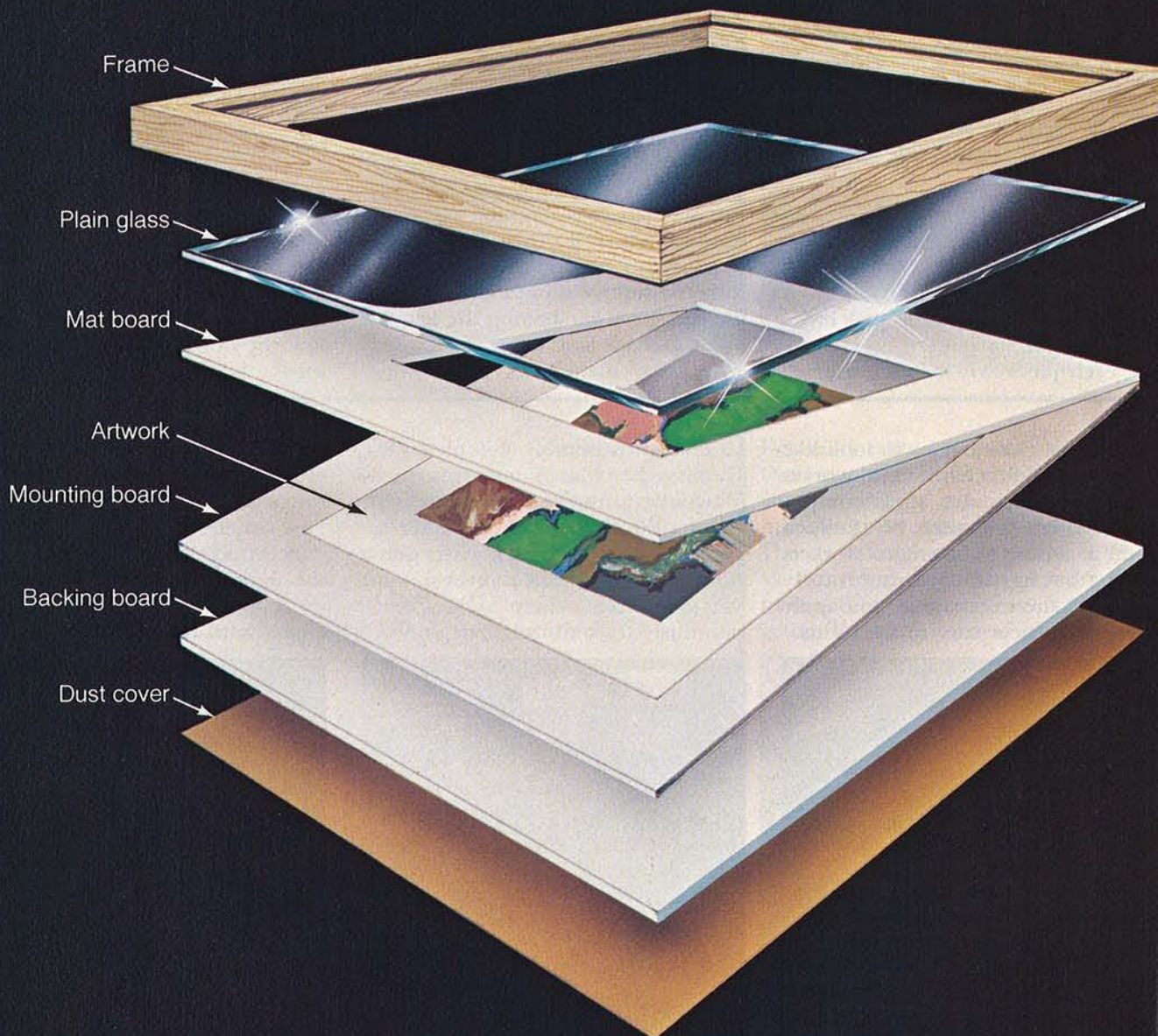


To ensure a uniformly colored chair, workers carefully match wood tones of all Thomasville furniture. First, an equalizing stain lightens the dark wood. Next, a sap stain darkens the light wood. After workers spray on a final stain coat, they seal the chairs with lacquer. 🌲



Written by Jim Hufnagel with Marlen Kemmet; photographs by Richard Hagerty

PICTURE THIS  
**YOU CAN FRAME  
LIKE A PRO**



It's one thing to be able to accurately cut and join four pieces of wood into an attractive-looking frame. But preparing artwork for framing (and for posterity)—now that's another story. Read on and you'll learn the ins and outs of how to correctly mount photos, posters, needlework, and other types of artwork. It's not nearly as difficult as you might have imagined, and surprisingly, requires only a small investment in equipment.

**W**e don't have any resident framing experts on the *WOOD*® magazine staff, so for this article, we turned to a couple of professional framers for a helping hand.

Marlene Olson, owner of Olson-Larsen Galleries in Des Moines, has done framing for museums and individuals for more than nine years. She has a genuine interest in spreading the word about good framing procedure because, she says, "A lot of the pieces that come into our gallery for framing have been damaged by improper mounting."

Glenda Shaw, our other consultant, has framed hundreds of needlework projects for Dot's Frame Shop, also in Des Moines.

We spent some time watching these two ladies perform their feats—asking questions all the while—and we now have a better handle on this subject ourselves. First we'll go through mounting works of art on paper, then we'll show you how to mount needlework. Professional framers mount artwork first, then fit a frame to the mounted piece, so we'll look at frame dimensions last (see page 47).

## HERE'S WHAT YOU'LL NEED



### THE BASICS

No matter what your skill level, or the type of mounting project, you'll need these tools to do the job correctly: (1) metal straightedge with nonskid backing for guiding a mat cutter; (2) ruler; (3) mat cutter for making beveled and straight cuts; (4) glue stick for attaching the frame's dust cover; (5) kraft paper for a dust cover; (6) ¼" foam-core stock for making a rigid backing board; (7) rag board (acid-free mounting board) to make a mat and form an acid barrier; (8) adjustable-jaw pliers for squeezing brads into the frame; (9) picture-hanging wire; (10) rubber bump-

ers for cushion between the frame and wall; (11) ¼" screw eyes (¾" long) for fastening the picture-hanging wire to the frame; and (12) ⅝"×#18 brads for securing the picture package in the frame.

### ARTWORK EXTRAS

If you're working on a poster, photo, or other art on paper, you'll need: (13) linen tape for fastening the art, mat, and mounting boards together; (14) distilled water for wetting the linen tape; (15) marking gauge and pencil for drawing cutting lines; (16) dusting brush for keeping the workpiece clean; (17) 1" brush for applying distilled

water; and (18) burnishing bone for smoothing beveled edges.

### NEEDLEPOINT EXTRAS

And for needlework, get hold of (19) pushpins to stretch and temporarily attach the needlework to the backing board; (20) quilt batting to back the needlework and give it a three-dimensional look; (21) stapler for attaching the needlework; and (22) scissors for cutting the quilt batting.

You may already have many of these supplies. The mat cutter we use costs about \$15; a small roll of linen tape, about \$4. See the Buying Guide on page 47.

*Continued*

# FRAME LIKE A PRO



## HOW TO MOUNT PHOTOS, POSTERS, AND

To help in explaining the mounting process for all so-called works of art on paper, we selected the acrylic painting shown here. The painted area measures 6×6", and it's centered on a 9×9" piece of paper. The sizes we refer to from time to time apply to this particular painting, but the process will be the same no matter what paper project you're working on—just use your own dimensions.

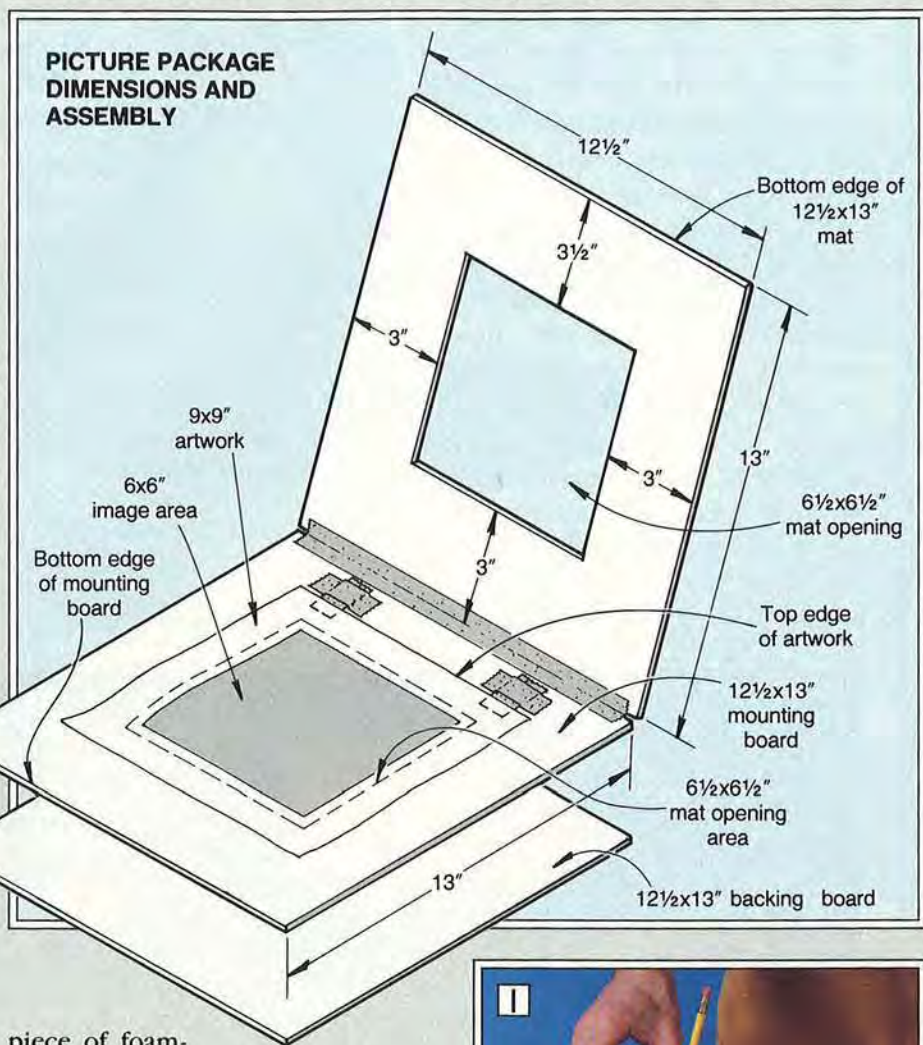
### SIZING THE PICTURE PACKAGE

(Note: The picture package includes a backing board, mounting board, artwork, and mat board.)

Start by measuring the dimensions of the image area of your project. As stated above, ours measures 6×6". And since we wanted to include the artist's signature, we left a ¼" border around the painted area. As you can see by studying the illustration at right, this means that we will need to cut a 6½×6½" mat opening to frame our painting.

With this one dimension fixed, you now can determine the outside dimensions of the mat, mounting board, and backing board. Follow Marlene's advice and figure on a 3" border at the top and sides of the mat opening and 3½" at the bottom. "A 3" border is pretty standard, that is unless you're dealing with art that's either very small or very large. Make the bottom border 3½" to prevent the artwork from sinking," Olson advises. "Sinking" refers to the illusion of matted artwork appearing lower in a frame than it actually is.

Next, transfer these outside measurements to two pieces of rag board (one each for the mounting board and the mat board) and one

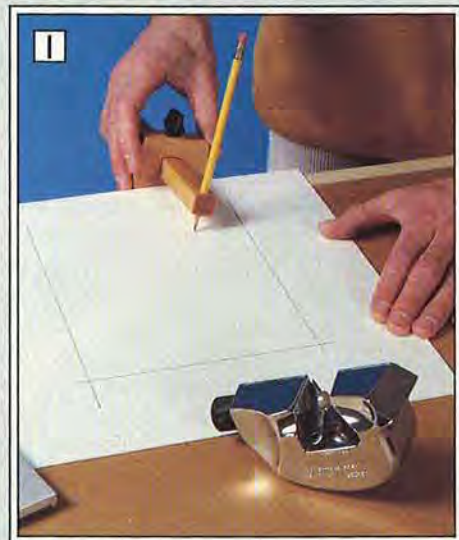


piece of foam-core stock (for the backing board). Using a mat cutter set for a straight (not beveled) cut, and a straightedge, cut all three boards to size.

And finally, to prepare the mat opening for cutting, lay the mat board front side down on a clean work surface. Then, set your marking gauge and outline the opening with faint pencil marks, as shown in photo 1.

### HOW TO CUT THE MAT OPENING

Learning to use a mat cutter takes a little time, so start by reading the instructions that come with the



▲ A marking gauge helps pencil the mat opening (for photo purposes, we darkened the lines—faint lines work best).

# OTHER ARTWORK

tool. Then, make several practice cuts on scrap mat stock.

Now, with your thumb and the point of the blade facing the outside of the mat (see photo 2), begin the cut about 1/8" beyond the end of the intersecting lines. (Starting the angled blade beyond the corner on the back side of the mat makes the cut complete on the face side.) Next, line up your straightedge so the mat cutter follows the penciled line, and push the cutter 1/8" beyond the next intersecting line. Rotate the mat board 90°

counterclockwise, and repeat until you've cut all four sides.

After cutting, erase the pencil lines. Otherwise, they could transfer to the artwork.

## POSITIONING AND SECURING THE ART

To "hinge" the mat board to the mounting board, lay both boards down (mat board front side down, mounting board front side up), with their top edges touching and flush at the ends. Then, cut a piece of linen tape about the width of the

boards, wet its gummed surface with distilled water, and center the tape on the joint.

Now, lay your artwork in the center of the mounting board, and hold the mat just above the artwork with one hand. With your other hand, position the art so the desired image shows through the mat opening. Open and close the mat until you're satisfied with the positioning. Then, place a protective scrap piece of rag board on the image, and place a weight on the scrap to hold the image in position.

To attach the artwork to the mounting board, follow the process in the illustration at *left*. Wet the tape lightly—don't soak it.

If you have a glass-cutting tool, cut a piece of single-strength glass to the same dimensions as the backing board. Or, have the people at your local hardware store or glass shop cut the glass for you. Clean the glass with a mild water-vinegar solution.

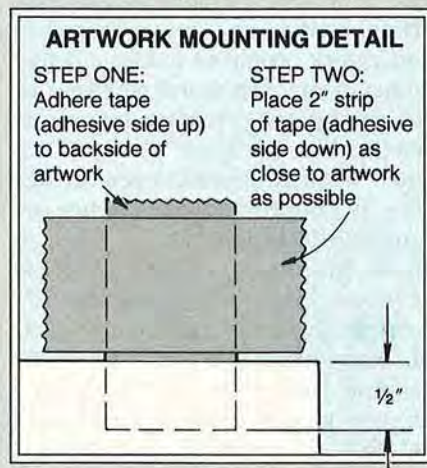
Assemble the picture package by laying down the backing board and stacking on the mat assembly next. At this point, check the overall appearance of the mat. Brush away any dust or lint on the mat, then lay the glass on top. Place the frame over the package as shown in photo 3 at *left*.

Slide the package halfway over the work surface edge, hold the package together, and turn it over. To secure the package, squeeze brads in with an adjustable pliers, spacing them 3" apart and coming within 1" of the corners (see photo 4 for how to do this). Be careful not to drive the brads completely through the frame.

To make the dustcover, professional framers use brown kraft paper (grocery-bag-type paper), but any sheet of strong paper will work. Run a glue stick along the back edge of the frame, and apply the dustcover as shown in photo 5.



▲ With the straightedge held down firmly, push the mat cutter alongside it to cut the mat opening.



▲ Place the frame over the picture package as shown. Now, check for any lint or dust trapped under the glass.



▲ Apply an oversized dustcover to the frame's back, and trim to size with a razor blade or an X-acto knife.

◀ An adjustable pliers with its jaw padded with masking tape makes a great brad driver.

*Continued*

# FRAME LIKE A PRO



## MOUNTING NEEDLEWORK: A FEW POINTERS

Needlework projects present a different set of challenges to novice and professional framers alike. Glenda Shaw, our needlework consultant, said, "About 90 percent of the needlework I do is mounted with a quilt batting." Although some people mount needlework flat, we'll go through the more-popular method.

### PREPARING THE NEEDLEWORK PACKAGE

The section-view shown *below* depicts the parts of the needlework package. Note that you have a foam-core backing board topped by a mounting board, with a layer of quilt batting on top of that. The needlework rests on this cushion and attaches to the backing board. The batting serves two purposes. It gives the needlework a three-dimensional look and also helps disguise any lumps from large stitchery knots.

Once you have completed your needlework project, measure the dimensions of the image area, and decide how far you want its borders to be from the frame. You'll need at least 1" of fabric to wrap around the backing board and to attach the project.

Because this process doesn't require matting, cut the backing and mounting boards to the same size as the image area. See page 44 to find out how we cut these boards.

Use a glue stick to attach the white mounting board to the foam-core backing board. Avoid using colored rag board that may reflect through the batting and the needlework. In addition, mounting board blocks acid; see the tip on page 47

about the importance of blocking the travel of acid.

Now, cut a piece of quilt batting (available from fabric stores) to a size slightly larger than the two boards you just cut, and attach it to the mounting board with a glue stick. With scissors, cut a beveled 45° edge around the batting. The bevel allows the needlework piece to smoothly taper into the frame.

### STRETCHING THE NEEDLEWORK

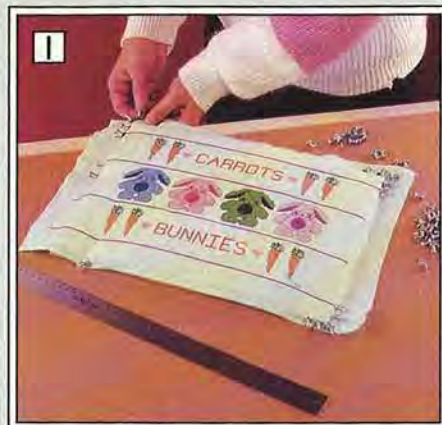
Lay down the assembled package, batting facing up, and center the needlework on top of it. Use a ruler to check for even borders. Place a few pushpins into the backing board's corners (see photo 1 at *right*). You can precisely center the piece by counting fabric stitches or "squares," if desired.

Now, place pins into the edges of the foam-core board about ½" apart, gently stretching the fabric as you move around the piece in any direction (see photo 2). Don't distort the image by overstretching. Feel free to restretch the needlework during this stage; even pros remove and replace pins often.

### SECURING THE NEEDLEWORK

Next, flip the needlework over and staple it to the backing board. As shown in photo 3, putting the staples in at an angle will provide greater hold. We chose ¼" staples because larger sizes may penetrate the needlework.

You can now remove the pushpins, place the package in its frame, and assemble as we did for the artwork package on page 45.



▲ We readjusted our corner pushpins to precisely center the piece.

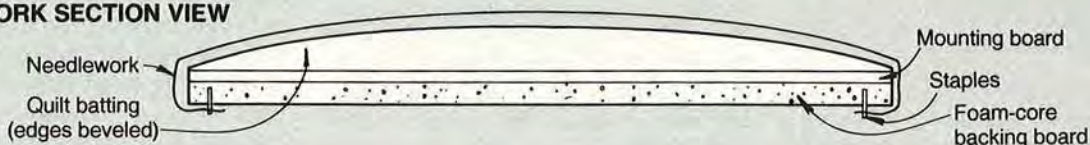


▲ You'll do most of the stretching as you pin the last two edges.



▲ During stapling, pull the corners tight. Otherwise, the needlework package may not fit into the frame.

### NEEDLEWORK SECTION VIEW



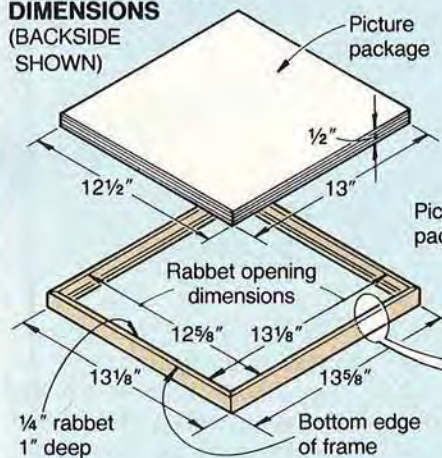
Produced with Marlene Olson and Glenda Shaw



# FITTING AND HANGING THE FRAME

With the artwork package completed, now you finally can get to use your woodworking skills. To determine the amount of frame stock you'll need, and where to cut the miters, first figure the rabbet opening by adding  $\frac{1}{8}$ " to each of the picture package dimensions (so the package fits comfortably). The drawing *below* shows this graphically. The  $12\frac{1}{2} \times 13$ " picture package from our first example requires a  $12\frac{5}{8} \times 13\frac{1}{8}$ " opening.

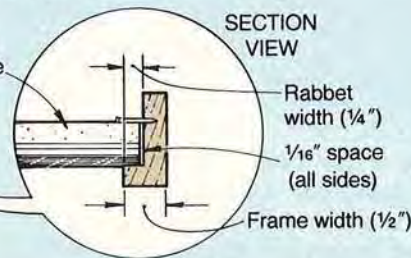
## FRAME AND RABBIT DIMENSIONS (BACKSIDE SHOWN)



Then, measure the width of your frame material less the rabbet (see section view *below*). In our case, this equals  $\frac{1}{4}$ " ( $\frac{1}{2}$ " -  $\frac{1}{4}$ "). Now, multiply that number times 2 ( $\frac{1}{4}$ "  $\times$  2 =  $\frac{1}{2}$ "). Add that amount to the rabbet opening dimensions— $12\frac{5}{8}$ " +  $\frac{1}{2}$ " =  $13\frac{1}{8}$ " and  $13\frac{1}{8}$ " +  $\frac{1}{2}$ " =  $13\frac{5}{8}$ "—to calculate the outside dimensions of your frame.

## PUTTING YOUR PROJECT ON THE WALL

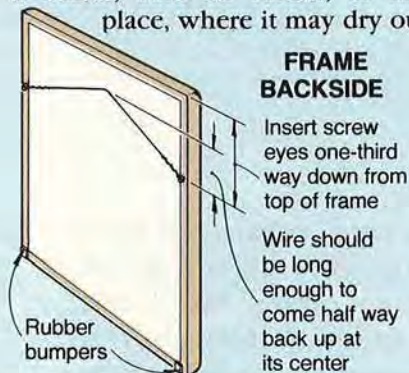
With the frame package together, drill pilot holes for the screw eyes (see illustration *below, right*, for positioning). Twist them in by hand, or gain added leverage by putting the point of an awl through the eye and then turning.



Fasten the hanging wire by looping it twice through the eyes, then twisting it back around itself. Wrap the loose wire ends with masking tape. Attach self-adhesive rubber bumpers to the bottom of the frame. Finally, use picture-hanging hooks rated for the weight of your frame to secure it to a wall.

Your tastes dictate where to you hang pictures, but follow these tips:

- Don't let direct sunlight hit the frame. Strong light fades pigments in the artwork and mat boards, and may even cause condensation on the inside glass surface.
- Avoid placing the artwork above a heater, cold air return, or fireplace, where it may dry out.



## FRAME BACKSIDE

Insert screw eyes one-third way down from top of frame  
Wire should be long enough to come half way back up at its center  
Rubber bumpers

# TIPS FROM OUR FRAMING EXPERTS

## 1 WORK CLEAN

Place a cardboard sheet over your work surface to keep it clear of anything that could soil or scratch your workpiece. The cardboard also will prevent your mat cutter from slicing into the workbench. Wash your hands to keep skin oil off the artwork and mat.

## 2 USE A THICK STRAIGHTEDGE

Mat cutters can jump over a yardstick or similar thin edge (less than  $\frac{1}{4}$ " thick), possibly causing injury. The straightedge should have a nonskid backing. If you have difficulty keeping the straightedge in position during long cuts, clamp it to the work surface.

## 3 ACCEPT NOTHING LESS THAN ACID-FREE

You may have never heard of acid-free rag board, but any framer worth his or her salt uses only acid-free materials for anything in contact with artwork. If given the chance, acid will contaminate adjoining materials, causing weakening and discoloration of fibers. Cardboard and kraft paper contain high amounts of acids, but can be used in the mounting process if separated from the artwork by an acid-free barrier, such as rag board.

You can purchase white acid-free rag board from most art stores. Buy multicolored acid-free rag board and linen tape from the Buying Guide source at *right*.

## 4 GIVE THE ARTWORK SOME SPACE

Like you, artwork needs space. Never place it directly against glass; doing so will promote mildew growth. Beyond aesthetic reasons, a mat serves as a spacer between the artwork and glass. If you don't use a mat, hide a  $\frac{1}{8}$ "-thick spacer behind the rabbet and between the artwork and glass.

## BUYING GUIDE

For a complete catalog of framing supplies, including all the materials used in this article, contact:

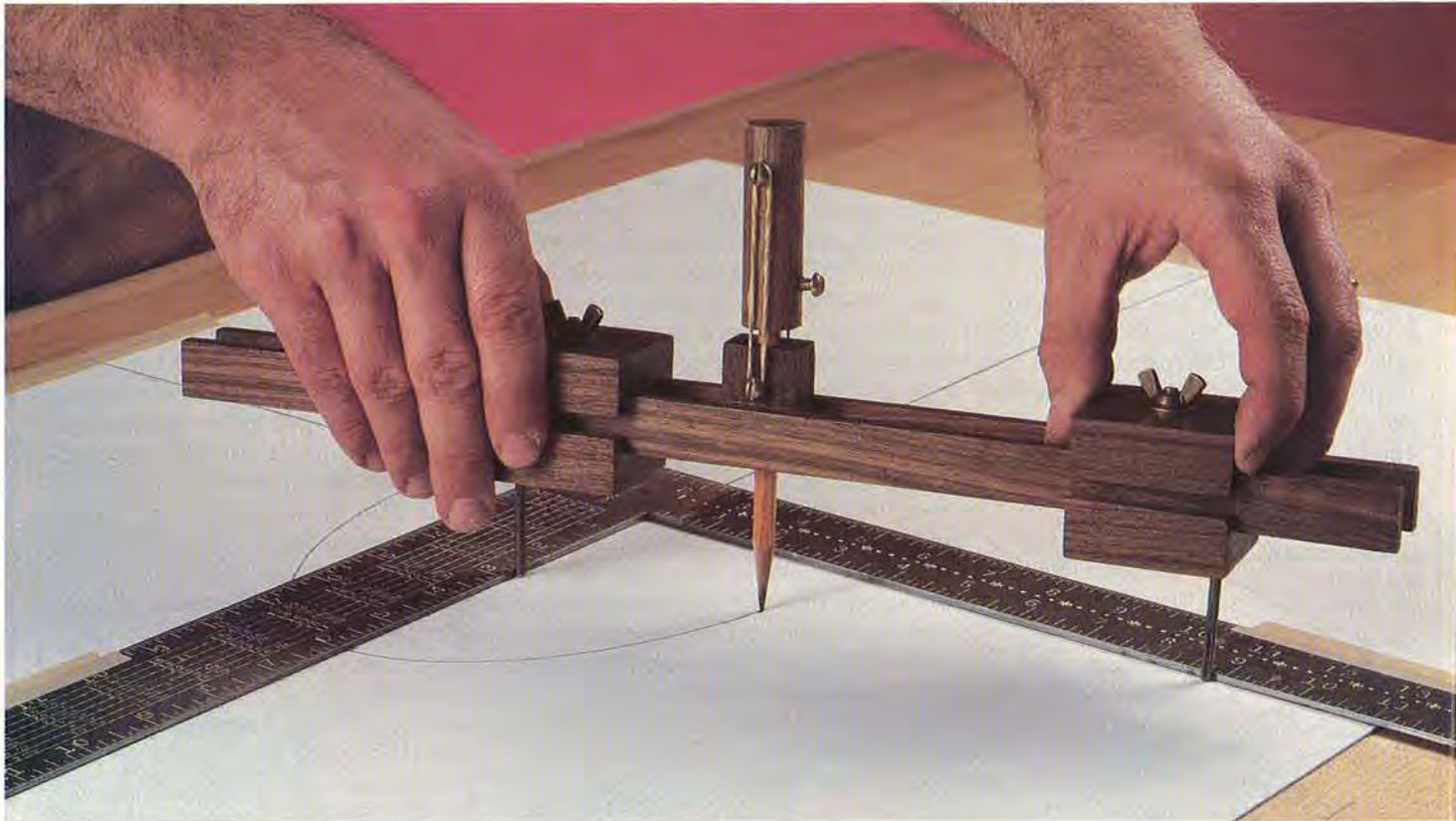
Light Impressions  
439 Monroe Avenue  
Rochester, NY 14607-3717  
716/271-8990

Written by Bill Krier

Photographs: Hopkins Associates; Bob Calmer

Illustrations: Bill Zaun; Advertising Art Studios, Inc.

# HOMEMADE OVAL MARKER



When Don Polson of Albia, Iowa, stopped by the *WOOD* magazine offices for a tour not long ago, he brought with him one of his favorite homemade tools—an oval marker. Don uses the device for marking mat board and laying out picture frames with oval cut-outs. We think you'll enjoy giving Don's ingenious tool a workout in your own shop.

*Note: For more information about picture framing, see our techniques article beginning on page 42.*

## FORM THE SLIDING BLOCKS

**1** Cut a piece of  $\frac{3}{4}$ "-thick walnut to  $1\frac{3}{4}$ " wide by 10" long. Later, you'll crosscut the strip into four sections for the sliding blocks (A).

**2** Mark the groove locations on one end of the walnut strip where shown on the Sliding Block Drawing. Cut or rout a pair of  $\frac{1}{4}$ " grooves  $\frac{1}{4}$ " deep along the bottom

face of the strip. (We cut ours on the table saw using a dado blade.)

**3** Crosscut four pieces, each 2" long, from the 10" strip. Using the dimensions on the Sliding Block Drawing, mark the center points, and drill holes in each block.

## NOW, CUT THE REST OF THE PIECES

**1** Cut a piece of  $\frac{3}{4}$ "-thick walnut to  $2 \times 16$ ". Position the rip fence  $\frac{7}{32}$ " away from the inside edge of the table saw blade, and rip a beam (B) to  $\frac{7}{32}$ " wide. Check that the beam slides easily in the  $\frac{1}{4}$ " grooves in the sliding block; reset the saw fence if necessary. Then, cut the second beam to width.

**2** Cut the pencil holder (C) to size. Mark the center point on the top end, and drill a  $\frac{5}{16}$ " hole through the piece. Now, mark the locations, and drill the  $\frac{5}{32}$ " holes for the pair of roundhead machine screws.

**3** Cut a piece of  $\frac{3}{4}$ " dowel  $2\frac{1}{2}$ " long for the pencil tensioner (D).

**4** Clamp a long piece of scrap stock to your drill press table, and drill a  $\frac{3}{4}$ " hole  $\frac{1}{2}$ " deep into it. Switch to a

$\frac{5}{16}$ " bit, and stick the  $2\frac{1}{2}$ "-long dowel in the hole in the scrap. Holding the dowel with a small handscrew clamp, drill a  $\frac{5}{16}$ " hole centered and through the dowel.

**5** Hold the pencil tensioner (D) in a handscrew clamp, and then drill the  $\frac{5}{32}$ " holes where shown on the Exploded-View Drawing.

**6** Sand all the walnut pieces.

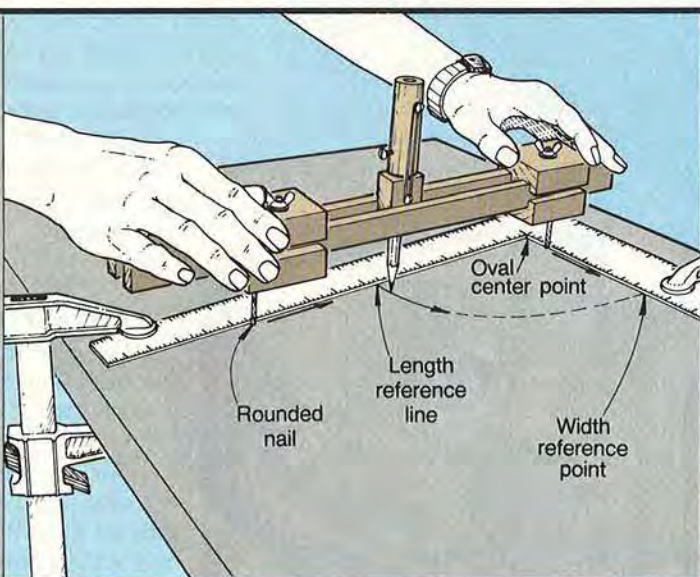
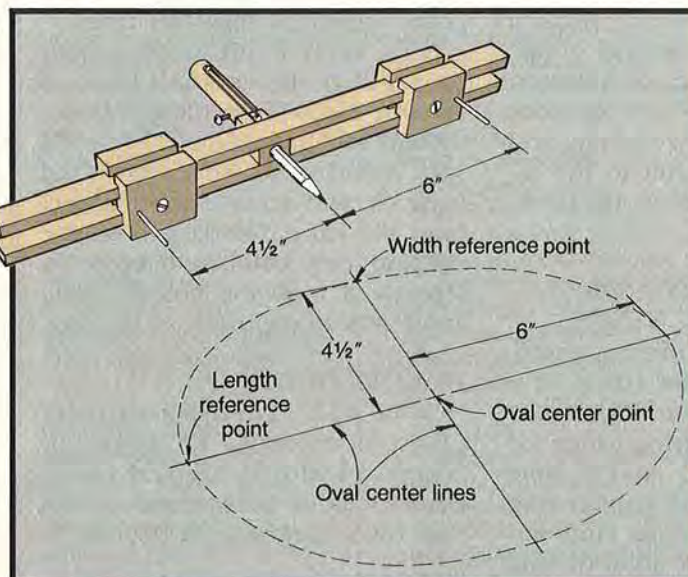
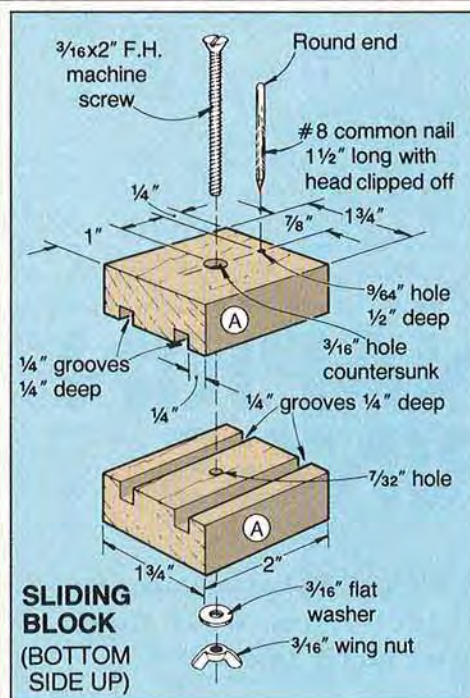
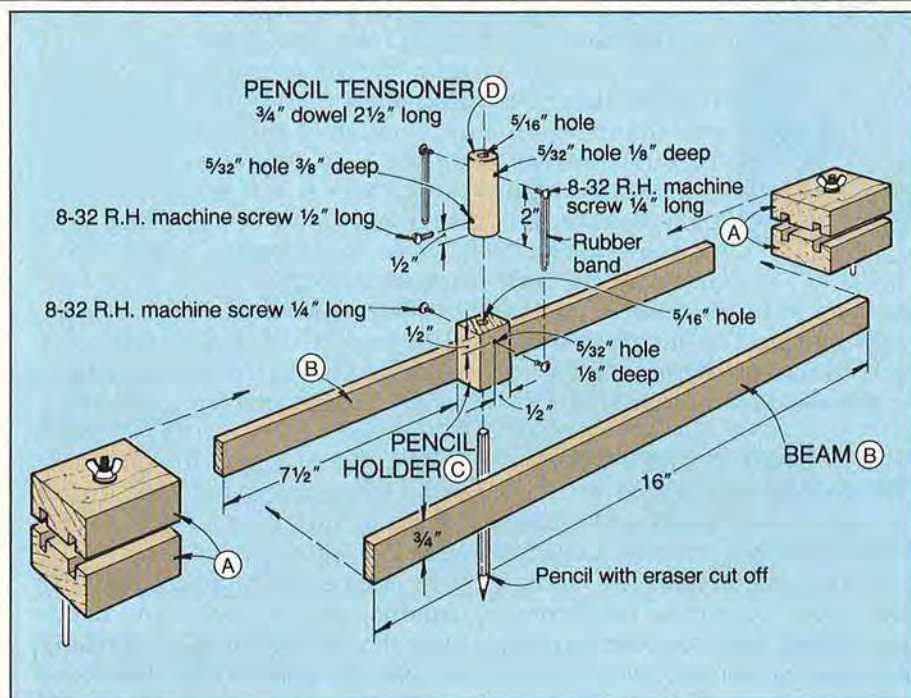
**7** Cut off the heads of two #8 common nails, so the nails are the same length. Sand a round-over on each clipped end. With the rounded end protruding, epoxy one nail into each block (see the Sliding Block Drawing for reference). The length of the nail protruding from each block should be equal.

## ASSEMBLE THE MARKER

**1** Join two of the sliding block parts (A) with a  $\frac{3}{16} \times 2$ " flathead brass machine screw, flat washer, and wing nut. Repeat for the second sliding-block assembly. Position a sliding block on each end of the pair of beams.

**2** With the bottom edges of the beams and holder flush, glue and

# A SIMPLE TOOL THAT SIMPLIFIES A DIFFICULT TASK



## HOW TO USE THIS HANDY TOOL

**STEP 1.** Mark the center of the stock, and draw perpendicular axis lines through the center. Measure and mark reference points on the axis lines for the oval length and width. Our oval measures 9×12", so we made our marks 4½" and 6" from the center. Position the sliding blocks so the distance from the pencil lead to the outside edge of the nails measures 4½" and 6" respectively. Tighten the wing nuts to hold the sliding blocks on the beams.

**STEP 2.** Align the inside edges of a framing square flush with the marked axis centerlines where shown above. Clamp the square in place. Position the oval marker where shown. Keeping the rounded nails firmly against the inside edges of the square, move the oval marker to form a quarter section of an oval. Reposition the square, clamp the square in place, and repeat the procedure three more times to complete the oval.

clamp the holder, centered from end to end, between the beams.

**3** Cut the eraser off a #2 lead pencil. Insert the pencil into the pencil tensioner. Then, insert the bottom end of the pencil through the pen-

cil holder. Position the pencil so the sharpened end protrudes about ⅛" lower than the rounded ends of the nails. Tighten the pencil in place in the pencil tensioner with an 8-32 machine screw.

**4** Finish; then fasten the screws to the pencil holder and tensioner. Attach the rubber bands. 🐿

Project Design: Don Polson  
Photographs: Hopkins Associates  
Illustrations: Kim Downing, Bill Zaun

# EXOTIC WOOD NAPKIN RINGS

An intriguing between-centers project from West Coast turner Mitch Talcove.



Another in a collection of patterns from the nation's top woodturners.



Mitch Talcove

Exotic hardwood from Latin America puts bread on the table for California lumber merchant Mitch Talcove. Mitch contracts for logs, harvested from Central America and Mexico, and

cuts them in his sawmill in Puerto Vallarta, Mexico. In his spare time, Mitch thinks up creative ways to use valuable sawmill scraps.

## FIRST, SHAPE A TAPERED, SOFTWOOD MANDREL

Cut a piece of softwood 1½" square by about 8" long for the mandrel. "A fir or pine 2×4 works well," Mitch notes. "A softwood will compress slightly and keep the napkin blank snugly attached when turning it to shape. Harder woods won't compress as well." Mark a center point on each end of the mandrel, and mount it between centers on the lathe. Turn the stock round with a ½" gouge, and taper the mandrel to the dimensions shown on the drawing below.

## HERE'S HOW TO TURN THE RINGS

For ease in turning round, bevel-rip the edges of a 2×2×12" turning square (see the Buying Guide for our source) on the table saw. Cut the napkin ring blanks to 1¾" long. Find and mark the center point on one end of each blank. Using a drill press and a Forstner bit, bore a

1¼" hole through the center of each napkin blank.

Remove the tapered mandrel from the lathe, and slide a napkin ring blank onto it until it fits snugly. Now, twist the blank clockwise to lock it in place. Turn the blank round with a ½" gouge and form the slight tapers on each ring with a skew. Mitch prefers a wall thickness of about ⅛".

To sand the inside of each napkin ring, Mitch makes his own sanding drums. Here's how to do it: wrap double-faced tape around a ½"-diameter piece of dowel stock 3" long. Then, adhere 100-grit sandpaper to the tape, chuck the dowel into your drill press, and sand the inside of each napkin ring. Now, slide one napkin ring back onto the mandrel, start the lathe, and hand-sand the outside of it, progressing to 400-grit paper. Stop the lathe and do the final sanding with the grain. Repeat for the other rings.

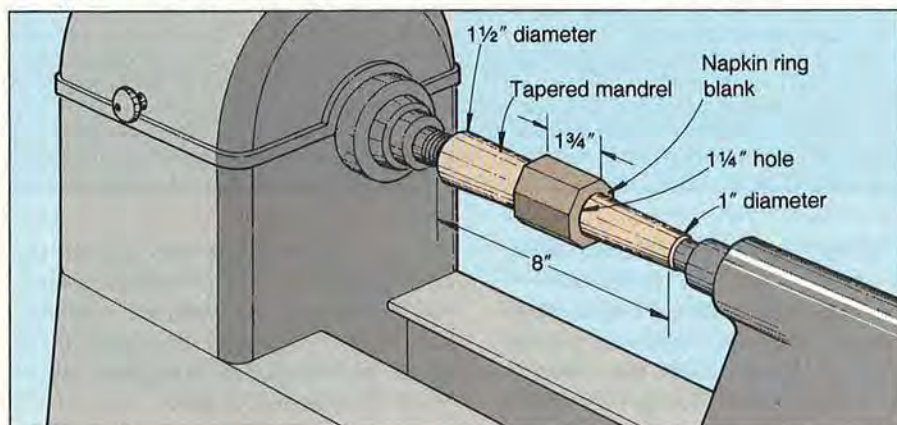
Now, apply finish to the napkin rings. Mitch likes to finish his with Liberon Black Bison Clear Wax, although any high-content carnauba wax would work. Next, loosen the tailstock, and remove the mandrel from the lathe. Carefully twist the napkin ring counterclockwise to separate it from the holder. Then, apply wax to the inside of the ring.

## BUYING GUIDE

• **2×2×12" Turning square.** Choice of cocobolo, \$5.75 ppd., or bocote, \$4.90 ppd. Tropical Exotic Hardwoods of Latin America, P.O. Box 1806, Carlsbad, CA 92008. 🌿

Photographs: Hopkins Associates, David Schwefel

Illustration: Kim Downing, Bill Zaun



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June 1987

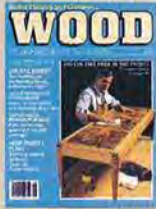


# WOOD

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Issue 18  
August 1987



Issue 22  
April 1988

Issue 19  
October 1987



Issue 23  
June 1988



Issue 20  
December 1987



Issue 24  
August 1988

### Cumulative index for issues 17-24

If you save back issues of *WOOD*® magazine for future reference—as many of our readers do—save this index in a special spot. The index appears in the center of the magazine so you can remove it. We've tried to keep the index easy to use. For example, after the subject "Picture frame," you'll see the number 21:50-53. This means the article on pages 50 through 53 of issue 21. Because "Picture frame" happens to be a project, you also can find it listed in the "Project Index" on page 53.

The index for *WOOD* issues 1-8 appeared in issue 9 (February, 1986). The index for issues 9-16 appeared in issue 17 (June, 1987).

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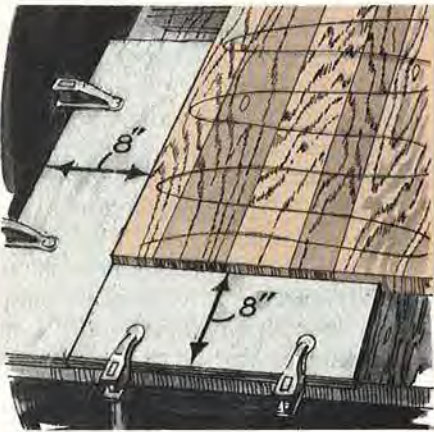
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# GET SMOOTH RESULTS FROM YOUR BELT SANDER

A belt sander makes fast work of smoothing down rough stock. But if you're not careful, you can end up with ridges and gouges that seem to take forever to sand away. Here's how to do a perfect job every time.

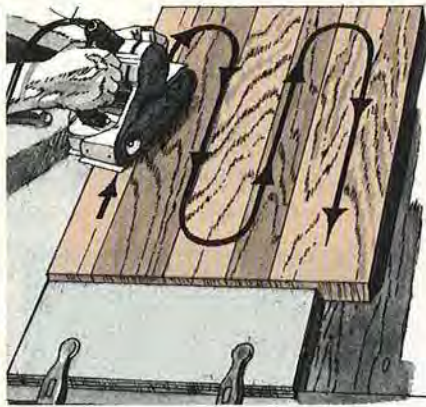


**I** Belt sanders cut aggressively, so you've got to secure the workpiece to the bench before you start. Try this method: Clamp short, narrow stock in a vise, so it projects about 1/4" above the clamp jaws.

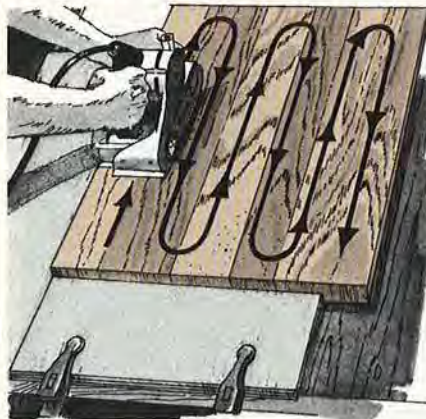
To secure wide stock, clamp 6"- to 8"-wide plywood stops where shown on the drawing *above*. Again, you want the top surface of the workpiece to project above the stop strips so they don't interfere with the sander.

An alternative method is adhering the workpiece to the work surface with double-faced carpet tape. If you don't mind sanding away the tape residue, you can save time and clamping materials this way.

Using a pencil, draw a wavy line across the surface of the stock, as shown on the drawing. This provides you with a visual reference while sanding—after you've completely sanded away the mark, it's time to switch to a finer-grit paper.



**2** Starting with 120-grit sandpaper, set the sander on the stock midway between both ends as shown in the drawing *above*. Keep the sander perfectly flat to the wood surface when you turn it on. Hold the sander at a 15° to 20° angle to the direction you're sanding. Belt-sand up and down the length of the stock, moving to the right about 1" at the end of each pass. Let the machine's weight do the work.



**3** After you've sanded away the wavy line, switch to a finer-grit belt. Draw a second wavy line, and make straight passes, holding the machine parallel to the grain as shown *above*. Move to the right about 1" after each pass. When the pencil line vanishes again, switch to a finer grit for finish sanding.



**4** No matter how carefully you sand, there's always the chance that you'll accidentally gouge the wood. So, each time you finish sanding with a particular grit, check your work before moving to the next grit. We suggest you clamp a small light to your bench, as shown *above*, so that it illuminates the stock from a low angle. By standing behind the light and sighting down the length of the wood, you'll be able to see even the slightest gouges.



**5** Sanding a narrow board or edge can be especially difficult because the sander tends to rock from side to side, rounding over the corners. Here's how to keep the corners sharp: Clamp a piece of scrap, called a *ledger*, to one side of the board (align both surfaces). Make the combined width of the ledger and board approximately equal to the width of the sanding belt. Draw a wavy line on the board and sand it, following the steps *above*.

Written by Jim Barrett Illustrations: Jim Stevenson

# UNCOMMON STOCKS

There's plenty of talk about the stock market in tiny Warsaw, Missouri. Not the Wall Street variety, though. Local folks, as well as sportsmen and firearms collectors the world over, prize the work of Reinhart Fajen, Inc., gunstock makers, as functional investments.



Anyone in the Missouri Ozark's town of Warsaw can direct you to Reinhart Fajen, Inc. "It's on Gunstock Drive, near Walnut."

No signs identify this world-renowned operation. And Reinhart Fajen doesn't even *look* like a factory. Production split among six widely dispersed buildings on the 7½-acre, tree-covered site reduces loss in the event of fire.

Despite this company's unassuming facade, a glimpse within reveals about 50 employees producing 35,000 to 45,000 gunstocks per year—making Reinhart Fajen, Inc. the world's largest producer of strictly gunstocks. Customers range from the person looking for a replacement stock for an inexpensive rifle or shotgun to the serious gun collector willing to part with equally serious amounts of money.

A semifinished stock, which requires the owner or a gunsmith to fit it to the action, starts at \$40 for a rifle and \$50 for a shotgun. An all-



out custom stock with ornate hand-carving and checkering can cost the princely sum of \$5,000—or lots more.

Customers don't even have to visit Warsaw. In fact, the company does most of its business by mail, with gunowners or gunsmiths.

◀ Hand-checkering a gunstock 32 lines to the inch demands patience and precision from a Reinhardt Fajen craftsman. The reward is a sure grip.



◀ Shotgun with stump-figured walnut thumb-hole stock and matching forearm

▼ Classic double-barrel shotgun restocked with feathered-crotch walnut

### IMPROVING ON MOTHER NATURE

A gunsmith by trade, Reinhart Fajen began making custom replacement gunstocks by machine in 1939 with a partner, John Bishop. Until that time, gun owners had only two choices: the mass-produced stock supplied with the gun from the factory, or prohibitively expensive stocks made entirely by hand. Their new business was an immediate success—one that carried over to Fajen after he bought out Bishop in the fifties, and later to John Beringer, who purchased the company in 1987.

Natural differences in wood make each gunstock special. But the company improves that uniqueness with custom checkering, carving, and laminating dyed woods. New owner Beringer says matter-of-factly: "We offer over 100,000 choices."

Walnut is the most popular

Not surprisingly, such highly figured wood couldn't possibly fall under traditional hardwood lumber grading standards. That's why the company applies its own. Here's just a sample of the grades they apply to walnut alone: *Utility* grade to *Supreme Deluxe* (four levels in plain walnut), *Semi-fancy* to *AAA Fancy* (another four levels in the lowest category of figured walnut), and *AAA Fancy Grade, Special Selection* (the cream of the crop in highly figured gunstock wood).

Sometimes, the customer supplies the gunstock blank for Fajen to turn and customize. Probably never, though, will they have another customer like the Georgia gun enthusiast who collects wood and combines both interests in a dramatic collection.

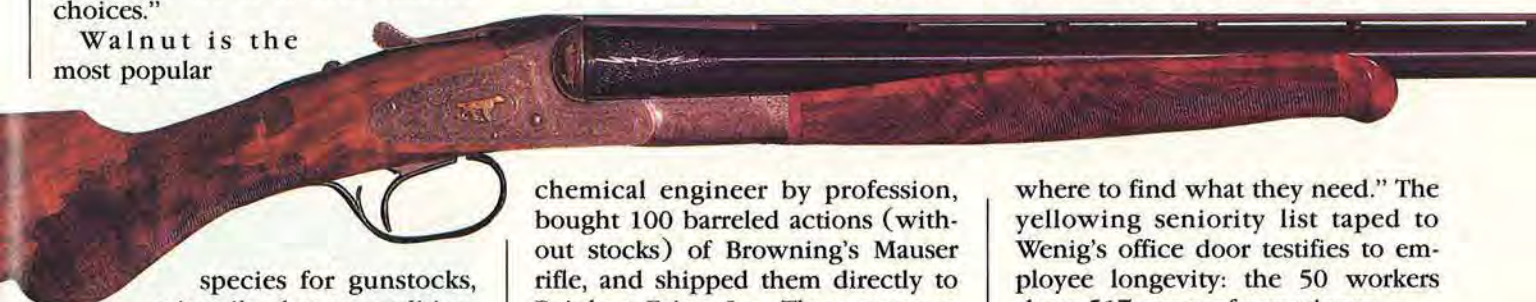
A few years ago, the Georgian, a

can identify the company's work easily by the styling and the quality of the wood-to-metal fit.

Says Marty Fajen, sales manager and daughter-in-law of the founder, "I can be watching a movie and spot one of our stocks right away." That's because even Fajen stocks for factory replacements don't slavishly duplicate the originals, but include subtle changes.

"We don't make our stocks from blueprints," explains Fred Wenig, a 33-year Fajen veteran, "we make them from patterns." Wenig, who his boss calls the best gunstock maker in the country, points to rows of full-sized walnut patterns lining walls like silent sentries.

The apparent random storage of the pattern stocks doesn't seem to bother anyone, though. "Most of our fellas have worked here a long time," Wenig says. "They know



species for gunstocks, primarily due to tradition, but also because it absorbs shock well. In fact, walnut accounts for 90 percent of Fajen's production. Within the walnut family, though, fall American black walnut, California claro walnut, French walnut, and Bastogne walnut! Birch, maple, mesquite, myrtle, pecan, and sycamore round out the readily available species. But, within those woods you can choose from varieties of fiddleback, stump, crotch, or just plain fancy figure. Add to those choices camouflage and the light-dark contrasts possible with laminated wood, and you'll see how the company one-ups Mother Nature.

chemical engineer by profession, bought 100 barreled actions (without stocks) of Browning's Mauser rifle, and shipped them directly to Reinhart Fajen, Inc. Then, every so often, unusual pieces of wood—acquired during world travel—arrived to be made into gunstocks. The most unusual arrival to date: a rare blank of pink ivory. At last count, the well-traveled collector had 60 custom-stocked rifles, identical except for the species of wood. Forty actions remain in the company's vault, awaiting whatever wood arrives next.

### UNSIGNED WORKS OF ART

"Our people are artists in a business climate," Beringer states. Although these works of art leave the factory unsigned, most gun dealers

where to find what they need." The yellowing seniority list taped to Wenig's office door testifies to employee longevity: the 50 workers share 517 years of experience.

Eighty percent of Fajen's business (primarily mail order; see catalog note at the end of this article) comes from gun shops, and the remainder from individual gun owners. However, Fajen representatives do attend the nation's largest gun shows and sportsmen's conventions to offer personalized attention. For instance, they offer a custom-fitting service. Once Fajen knows all dimensions, they custom-tailor a stock. According to Wenig, a dedicated shooter sees custom-tailoring guns and rifles as no more extravagant than a businessman's made-to-order dress shirts.

*Continued*

# UNCOMMON STOCKS

## NO-STRESS BLANKS FOR RUGGED USE

End-coated at the suppliers' sawmills to prevent premature drying, the rough-cut stock blanks arrive in Warsaw with about 40 percent moisture content. To ensure uniform drying, the first part of the drying process in the two Fajen kilns (each holds 22,000 gunstock blanks) adds steam to bring every piece of wood to the same moisture content level.

"Then," notes Wenig, "we start drawing the water out... slowly." For the 2¼"-thick blanks, slowly means up to six months to reach 8 percent moisture content. Even under these carefully controlled conditions, Fajen loses 3-6 percent of its blanks to splitting.

If a blank doesn't split in the kiln, Fajen craftsmen see to it that it won't split under the rigors of use, either. This insurance begins with laying out a pattern on the stock blank. Grain direction in the grip area behind the trigger—the thinnest part of the stock—becomes especially critical. The shock of recoil will surely split the stock if the grain doesn't run straight "downhill" to the butt. That also holds true for the forearm section. Fajen orders its gunstock blanks slightly oversize to allow accurate grain orientation in layout.

After being marked for grain direction, blanks proceed to the 36" band saw, where they take on a rough shape. Further rough-shaping on a duplicating lathe removes the corners of the blank.

## FINE-TUNING FOR FIT BEGINS 24 AT A TIME

Lew Massey runs duplicating carving machines that simultaneously produce up to 24 imitations of a pattern stock. "I've made a lot of sawdust since I started here in 1961," he quips.

Each of the spindle heads, connected to a single motor with flat

drive belts, has a high-speed steel cutter. When Massey flips the switch, the machine whirrs to life. With the prod of a 4'-long guide bar, he slowly moves the unsharpened stylus toward the master pattern. As cutters contact the blanks, Massey directs a cut less than ¼" deep on each.

When he shifts his grip for the next cut, the blanks gradually begin to take the pattern's shape. In an hour and forty-five minutes, the 24 stocks have been carved to completion, and move on to the next craftsman for more processing.

Fajen employees pride themselves on their gunstocks' wood-to-metal fit. Duane Kindle's 23 years of experience makes the intricate cuts in the stock for the barrel and receiver look effortless.

Kindle clamps an unfinished stock in a padded-leg vise, then brushes the underside of a gun barrel with "inletting black," a black marking powder. He then eases the barrel into position, gives it a tap with the heel of his hand, and takes the barrel out again. Where the powder leaves its mark, he removes a few thin curls with a gouge.

The wood-to-metal fit means more than appearance. If not fitted just right, the barrel can tear apart a stock with force from the recoil.

## SAWDUST MIX FOR UNDETECTABLE REPAIRS

Gene Coffey collects sawdust. His workbench boasts nearly two dozen jars filled with the sawdust of different-colored wood. He mixes it with epoxy to fill pin knots and other small defects in gunstocks before finishing.

For larger repair jobs, he inserts solid wood patches made from scrap wood. He looks first for color match, not species. He freely intermixes the different varieties of walnut, and will even insert a maple patch into walnut sapwood. "As long as it looks right," he says.



◀ An irregular stump figure stock, plus carving, fits this Winchester rifle.

▼ With a carving gouge, Duane Kindle removes wood from the stock to match the gun's action. A bad fit could splinter the stock.



Some repairs require an inlay technique. Coffey shapes the bed of the area of the patch with a 1/8"-diameter bit in a Dremel Moto-Tool. Then, he completely covers the area with masking tape. After cutting tape out of the patch area for a pattern, he searches for a scrap piece that will match the color and figure of the stock. A bit of final whittling gives the wood a snug fit.

### FINE FINISHES FOR FIELD OR FANCY

Bobbie Park fills grain and sands wood. With an air-powered Sears pad sander and a circular motion, he sweeps over convex curves and concave hollows. He uses 100-grit sandpaper for initial smoothing, then dampens the wood with water to raise the grain before switching to 180-grit sandpaper for the final go-over.

Walnut has open grain. For a smooth finish, Park fills it with a creamy, walnut-colored paste wood filler slathered on with a brush. He doesn't wait for the solvent to "flash off" and lose its sheen before scrubbing the filler into the pores and off the surface with a burlap

rag. After the filler dries, Park again machine-sands with fine 180-grit sandpaper.

Stocks marked to receive the pattern of tiny diamonds called checkering get all of Darrell Smith's attention. For 15 years he has produced the carved, low-relief designs that provide a better grip in the most-handled areas of the stock.

Smith has mastered standard patterns, and usually lays them out by

▲ Cherry and maple in alternate laminations create a tough and stable stock.

◀ A sanding swirl never shows on a Reinhart Fajen stock, even though Bobbie Park constantly moves his pad sander against the grain. A once-over with 180-grit preps the stock for finishing.

eye. With a few quick pencil strokes, he outlines the checkering on a custom stock. He then grabs a checkering tool. With a few deft strokes of its carbide cutter, he replaces the pencil marks with V-cuts. The bite of a Foredom flexible-shaft power tool featuring a serrated cutting wheel follows this.

Smith refines the pattern by hand. Fajen offers variety in the spacing of their checkering, from 18-32 lines per inch—the higher the number the greater the cost. Smith can also carve detailed outlines and floral accents around checkered areas.

At Reinhart Fajen, custom gun-stocks traditionally receive two coats of a Sherwin Williams' dull-sheen, sprayed-on catalyzed (two-part) lacquer called Sher-Wood Super Kemvar C. It has a close-to-the-wood look with little gloss.

Still, many collectors prefer traditional oil because it highlights wood figure without the buildup of a surface finish—even though it isn't weatherproof. "The oil is used only to finish filling the pores of the wood," Wenig explains, "and we wipe every bit we can from the



surface." Fajen's finishing is labor-intensive: A stock may receive as many as 15 coats, with drying time of 18 hours and scuffing with 500-grit sandpaper between coats.

For a high-gloss finish, the company relies on a product called Fullerplast. The sprayed-on, catalyzed alkyd varnish builds up an abrasion and moisture-resistant, deep-gloss that performs as well in the field as it looks in the gun cabinet. ●

For a copy of Reinhart Fajen's color catalog, send \$5 to:  
Reinhart Fajen, Inc., Box 338,  
Dept. WM, Warsaw, MO  
65355; 816/438-5111.

Written by Robert Settich  
Photographs: Richard Mansur

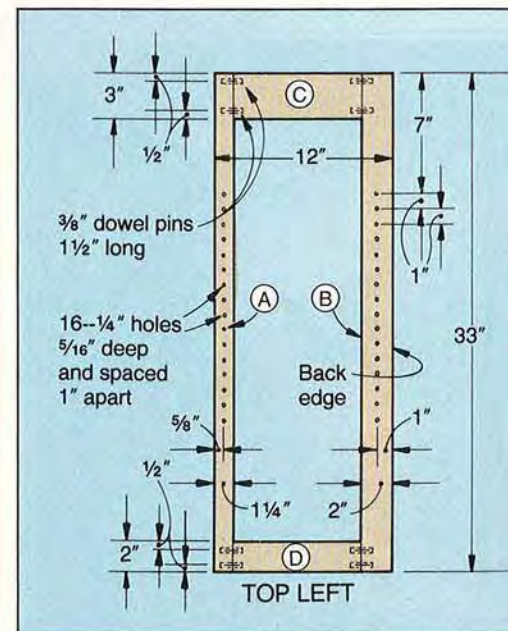
# SHOWCASE YOUR CHERRY

At first glance, our curio cabinet may seem like a major undertaking. But, if you'll take a good look at the drawings, you'll notice the entire project consists of just four subassemblies that form identical top and bottom cabinets. Come on; give this project a try. We know that you'll be pleased with the results.

## START WITH THE FOUR SIDE FRAMES

*Note:* For ease in construction, the side frames for the top and bottom cabinets match except for the rail placement. For a well-balanced design, we placed the wider rails (C) on the bottom of the bottom frames and along the top edge of the top frames. Study the drawings carefully before beginning construction of the side frames.

■ Cut the side frame stiles (A, B) and rails (C, D) to the sizes listed in the Bill of Materials on page 63.



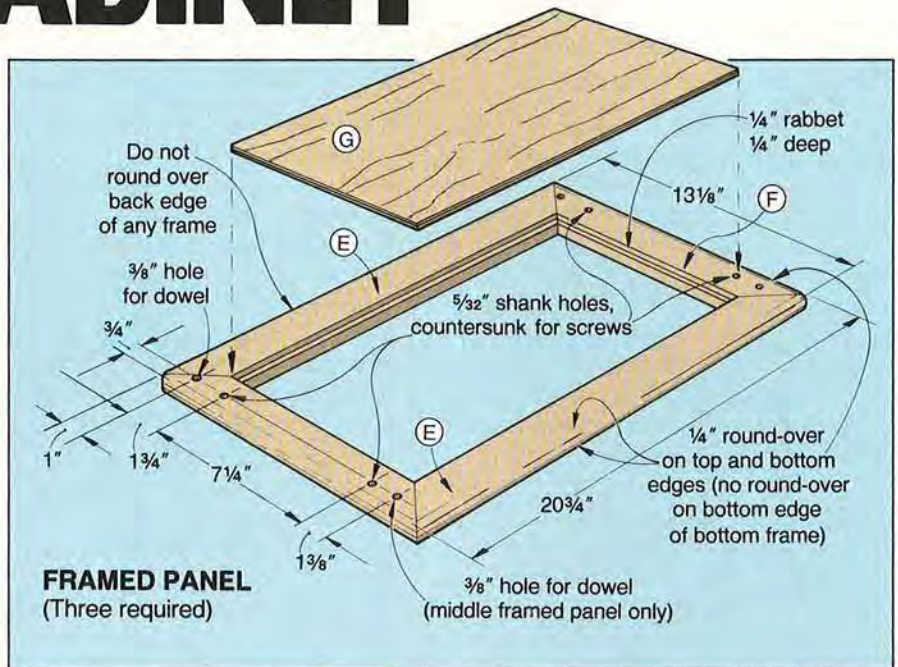
# COLLECTIBLES IN THIS STUNNING CURIO CABINET

**2** Clamp each frame together in the configurations shown on the Side Frames Drawing. Make marks for a pair of dowel holes at each glue joint. Remove the clamps. Using a doweling jig for alignment, drill  $\frac{3}{8}$ " holes  $\frac{13}{16}$ " deep at each mark.

*Note: When working with cherry, immediately remove all excess glue to prevent light-colored marks from appearing after staining. We wiped off all the glue squeeze-out with a damp cloth after clamping.*

**3** Glue, dowel, and clamp each side frame, checking for square.

**4** Mark the center points, and drill the  $\frac{1}{4}$ " shelf holes  $\frac{5}{16}$ " deep where dimensioned on the Side Frames Drawing. Sand the frames smooth.



## NOW, BUILD THE THREE FRAMED PANELS

**1** Miter-cut the framed panel fronts and backs (E) and the sides (F) to length from  $\frac{3}{4}$ "-thick stock 2" wide.

**2** Using a dado blade or dado set mounted to your table saw, cut a

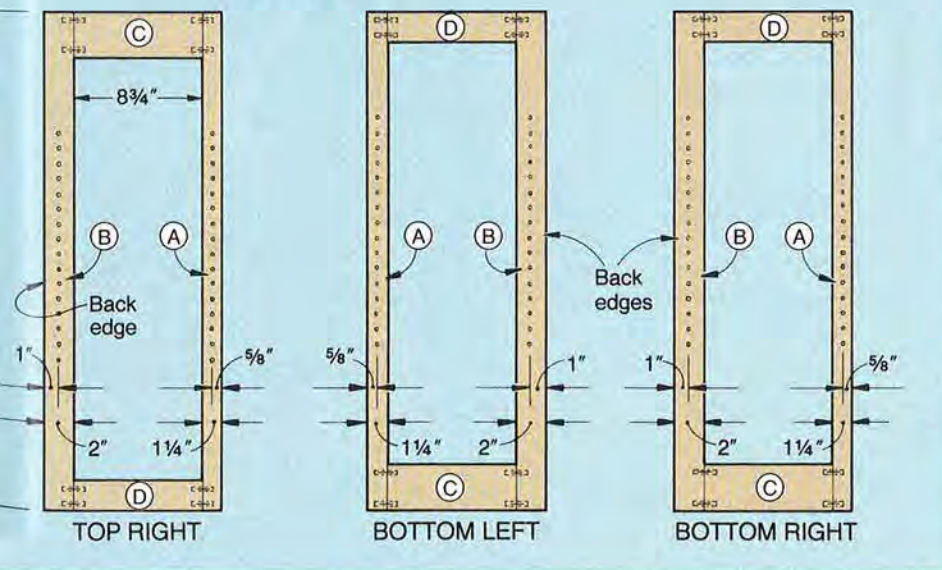
$\frac{1}{4}$ " rabbet  $\frac{1}{4}$ " deep along the top inside edge of each frame member.

**3** Using band clamps, glue and clamp each frame together, checking for square. Later, remove the clamps, and sand each of the three frames smooth.

**4** Measure the openings, and cut the insert panels (G) to fit from  $\frac{1}{4}$ " cherry plywood. (See the Buying Guide on page 65 for our source of cherry plywood.) Glue and clamp the insert panels into place.

**5** Rout  $\frac{1}{4}$ " round-overs along the edges of the framed panels where noted on the Framed Panel Drawing. Sand each assembly smooth.

## SIDE FRAMES



## ATTACH THE SIDE FRAMES TO THE FRAMED PANELS

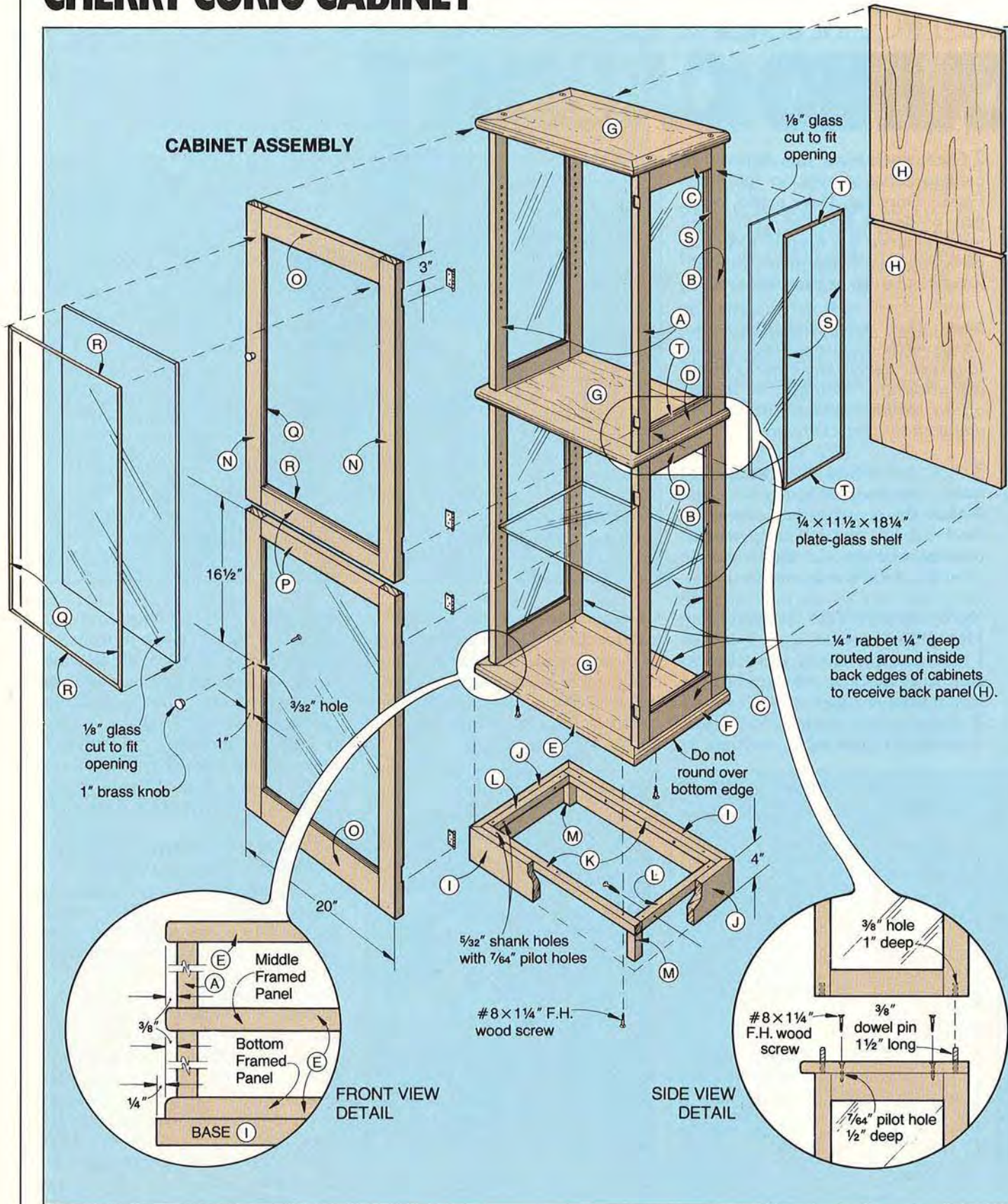
**1** Using the Framed Panel Drawing for reference, mark center points for the four screw locations on the top face of each framed panel. Drill the  $\frac{5}{32}$ " shank holes. Next, countersink the shank holes in the top and middle framed panels from the *top* side; then, countersink the bottom framed panel from the *bottom* side.

**2** Mark the four dowel-hole center points on the top face of the middle framed panel (see the Framed Panel Drawing for locations). Drill the  $\frac{3}{8}$ " dowel holes where marked.

**3** With the back edges flush, clamp the two bottom frames between

*Continued*

# CHERRY CURIO CABINET





### Bill of Materials

Part	Finished Size*			Materials	Qty.
	T	W	L		
<b>FOUR SIDE FRAMES</b>					
A	¾"	1¼"	33"	cherry	4
B	¾"	2"	33"	cherry	4
C	¾"	3"	8¾"	cherry	4
D	¾"	2"	8¾"	cherry	4
<b>THREE FRAMED PANELS</b>					
E	¾"	2"	20¾"	cherry	6
F	¾"	2"	13½"	cherry	6
G	¼"	9⅝"	17¼"	cherry ply.	3
<b>TWO BACK PANELS</b>					
H	¼"	19"	33½"	cherry ply.	2
<b>BASE</b>					
I	¾"	4"	21¼"	cherry	2
J	¾"	4"	13⅜"	cherry	2
K	¾"	¾"	19¾"	cherry	2
L	¾"	¾"	10⅜"	cherry	2
M	¾"	¾"	3¼"	cherry	4
<b>TWO DOORS</b>					
N	¾"	2"	32⅞"	cherry	4
O	¾"	3"	16"	cherry	2
P	¾"	2"	16"	cherry	2
<b>GLASS STOPS</b>					
Q*	¼"	¼"	27⅞"	cherry	8
R*	¼"	¼"	16"	cherry	8
S*	¼"	¼"	28"	cherry	16
T*	¼"	¼"	8¾"	cherry	16

\*Parts marked with an \* are cut larger initially, and then trimmed to finished size. Please read the instructions before cutting.

**Supplies:** #8×1¼" flathead wood screws, #4×½" flathead wood screws, #18×½" brads, ⅜" dowel pins 1½" long, ¼" plate glass for the shelves, 4—⅜" glass for the side frames, stain, finish.

“With a display case such as this, the focus should be on the items being showcased rather than on their enclosure. That’s why I specified cherry throughout; it has rich-looking, yet subtle grain that’s quite easy to live with. I can certainly see why generations of furniture makers have turned to cherry for their creations.”

*Jim Downing, Design Editor*

the bottom and middle framed panels, checking for square. (See the Front View Detail accompanying the Cabinet Assembly Drawing for frame location.) Using the previously drilled shank holes in the framed panels as guides, drill ⅞" pilot holes ½" deep into the side frames (see the Side-View Detail for reference). Now, remove the clamps, and glue and screw the two side frames between the two framed panels.

**4** Lay the bottom cabinet assembly on its back. Insert dowel centers into the ⅜" dowel holes in the top face of the middle framed panel. Clamp the top side panels in position between the top framed assembly and bottom cabinet assembly to transfer the dowel hole center points onto the bottom edge of the upper side frames. Now, using the previously drilled shank holes in the top framed assembly as guides, drill ⅞" pilot holes ½" deep into the top of the upper side frames.

**5** Remove the top cabinet assembly, and drill the mating dowel holes in the bottom edge of the upper side frames where indented.

**6** Install the dowel pins into the dowel holes in the middle framed panel. Next, glue the top cabinet to the bottom cabinet assembly.

**7** Carefully lay the cabinet face-down on a work surface covered with a blanket to prevent scratching the cabinet. Then, rout a ¼" rabbet ¼" deep around the inside edge of the upper and lower cabinet assemblies for the ¼" plywood back panels (H). Finally, chisel the rounded corners square.

**8** Cut the two back panels (H) to fit the rabbeted openings. Glue and

brad the ¼" back panels into place (we used #18×½" brads).

### CONSTRUCT THE BASE

**1** Miter-cut the exterior base parts (I, J) to size. Now, cut the base cleats (K, L) and glue blocks (M) to size. Drill and countersink screw holes into the cleats.

**2** Glue and clamp the exterior parts together with a band clamp, checking for square. Then, glue and screw the cleats into place flush with the top edge of the exterior base parts. Add the glue blocks, and sand the base smooth.

**3** Set the cabinet upside down on a blanket. With the back edges flush, center the base (also upside down) from side to side on the bottom framed panel. Glue and screw the base to the lower framed panel.

### BUILD THE DOOR FRAMES

**1** Rip and crosscut the door stiles (N) and rails (O, P) to size. Clamp each door frame together and make marks for a pair of dowel holes at each joint line. Then, with a doweling jig, drill ⅜" holes ⅛" deep.

**2** Glue, dowel, and clamp each door frame together, checking for square. Later, remove the clamps and sand the door frames.

**3** Place the cabinet on its back. Check the fit of the doors on the cabinet front. The sides of the doors should fit flush with the sides of the cabinet; plane the edges of the doors if necessary. You also want a ⅛" gap between the top and bottom of the doors and the framed panels. (When fitting the doors we marked one door as “upper” and the other as “lower” for ease in final assembly later.

*Continued*

# CHERRY CURIO CABINET

## CUT AND INSTALL THE GLASS STOPS

**1** Cut nine pieces of  $\frac{3}{4}$ "-thick cherry to  $1\frac{1}{2}$ " wide by  $36$ " long. Rout a  $\frac{1}{4}$ " round-over along all four edges of each piece.

**2** As shown in the two-step drawing below, cut four quarter-round cherry stops from each  $1\frac{1}{2} \times 36$ "-long strip. (We used a push stick for safety when cutting the long, thin stops.)

**3** Starting with one side panel, measure the opening and miter-cut the long glass stops (S) to length.

**4** Construct the jig shown below. Snip the head off a  $18 \times \frac{1}{2}$ " brad and chuck it into your drill. Use the jig to position the stops in the front of the frame. Drill through the stop as shown in the photo below right. Tap a brad into place in the hole just drilled. Fasten the *outside* stops on each side frame and the *front*

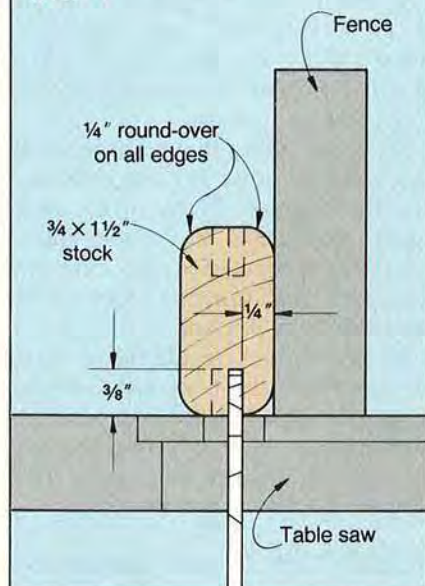
stops on both door frames; space the brads about  $7$ " apart. Set the brads, and fill the holes with putty. (You'll need the remaining stops later when installing the glass.)

## HERE'S HOW TO HANG THE DOORS

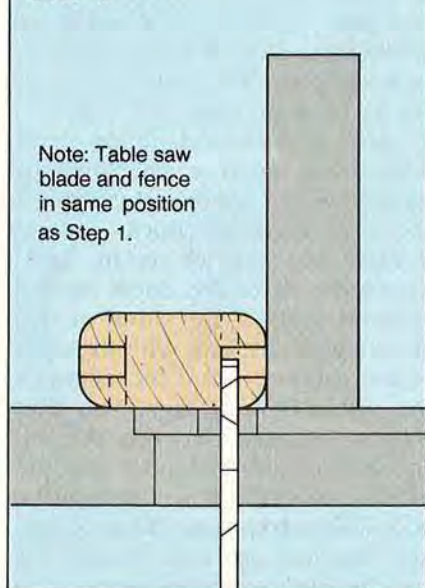
**1** Mark the hinge locations on the front of the right-hand side frames where shown on the Hinge and Mortise Drawing.

### FORMING THE GLASS STOPS

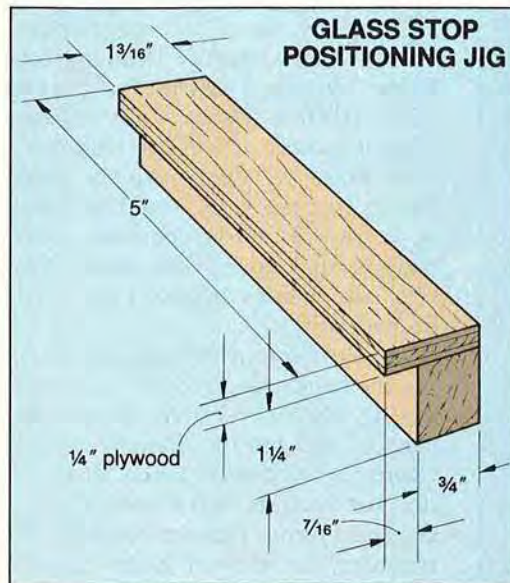
#### STEP 1



#### STEP 2

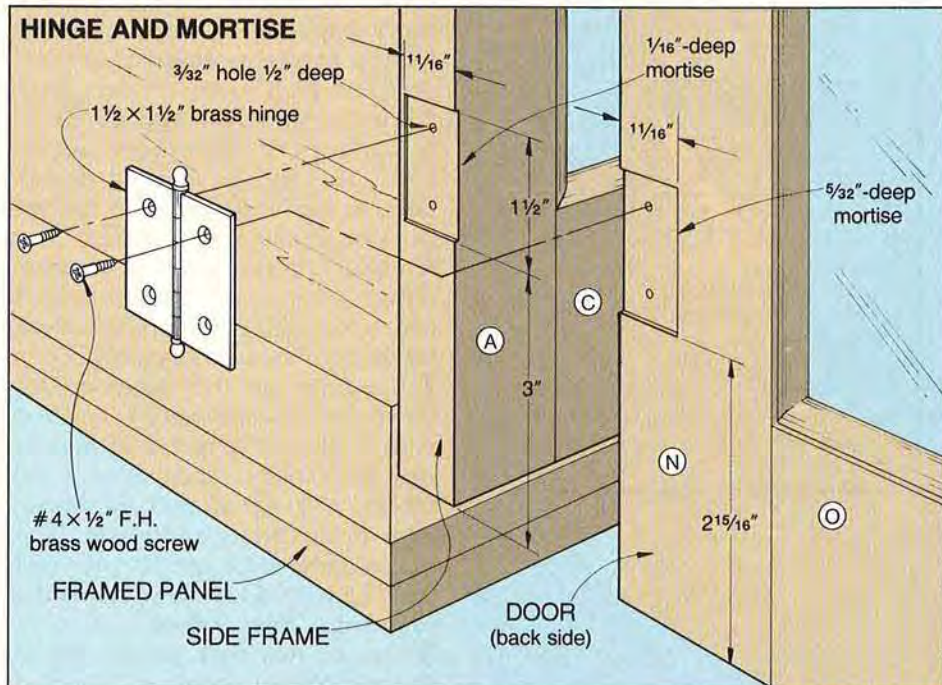


### GLASS STOP POSITIONING JIG



Use the jig to position the glass stops. Then, drill pilot holes and brad the stops into place.

### HINGE AND MORTISE



**2** Position the hinge on the marked outline, mark the screw hole locations, and drill the pilot holes.

**3** Screw the brass hinges to the side frames and score their outline into the frames as shown in the photo below. Remove the hinges.

**4** Chuck a  $\frac{3}{8}$ " or  $\frac{1}{2}$ " straight bit into your router. Clamp a piece of scrap stock to the inside edge of one of the side frames, making sure the top edges of the scrap stock and

the frame are flush. The scrap stock helps support and level the router when routing the hinge mortise. Next, routing just *inside* the marked lines, rout  $\frac{1}{16}$ "-deep mortises as shown in the photo below. Use a sharp chisel to finish cutting to the scribed-hinge outline.

**5** Clamp the doors into position in the cabinet front openings, and transfer the hinge locations onto the doors. Remove the doors from

the cabinet, and finish marking the hinge outline. Using the routing and chiseling method just described, rout  $\frac{5}{32}$ "-deep mortises on the back side of each door frame.

## FINAL ASSEMBLY

**1** Measure the openings and order glass cut to size for the four side panels, the two doors, and the three shelves. (We had the glass cut  $\frac{1}{16}$ " less in length and width for the doors and side frames to allow for movement of the wood.)

**2** Locate and drill the holes for the door knobs where shown on the Cabinet Assembly Drawing. Follow the two-step drawing below left to attach the catches and strikes.

**3** Position the glass, and then carefully drill the holes and brad the remaining cherry glass stops to the back side of each glass panel. Set the nails and fill the holes.

**4** Remove all the hardware from the cabinet and doors. Sand the wood parts smooth. Mask off both sides of the glass. Stain the cabinet and doors (we used cherry stain), and apply the finish.

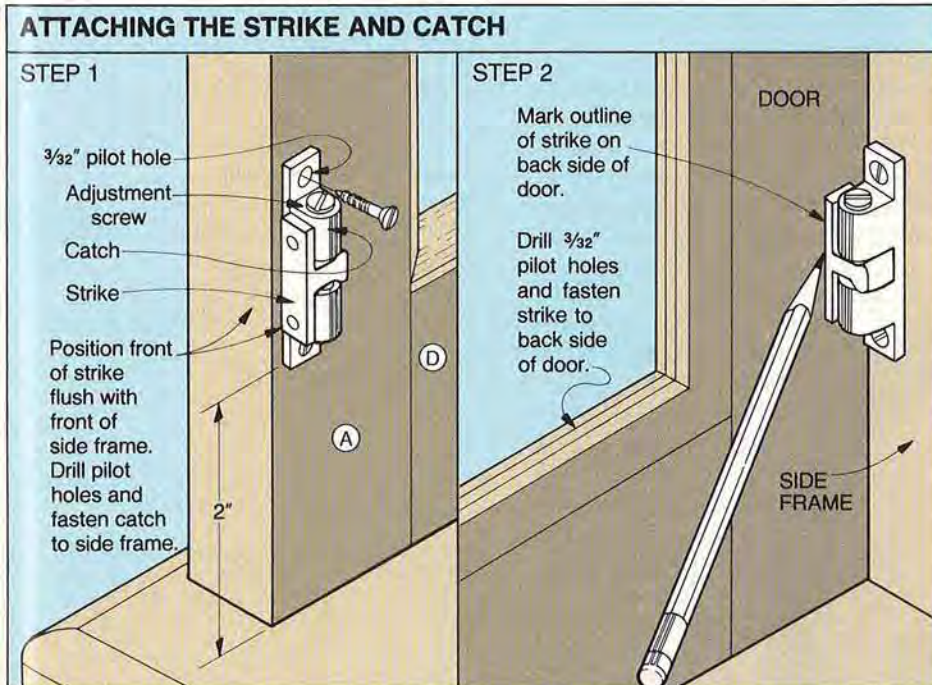
**5** Attach the two doors to the cabinet, place the cabinet against a wall, and add the glass shelves.



Screw the hinges to the cabinet. Next, scribe the hinge locations into the front of the side frame.



Clamp a piece of scrapwood to the front of the side frames for additional support, and rout the hinge mortises.



## BUYING GUIDE

• **Hardware.** Two pairs of  $1\frac{1}{2} \times 1\frac{1}{2}$ " solid brass hinges, catalog no. D1910, \$10.95/pair. Brass ball catch, catalog no. D3910, \$2.10 each (two required). Brass shelf supports, catalog no. D5736, 14 cents each (12 required). Brass knobs, catalog no. E1136, \$4.10 each (two required). Add \$3.50 per order for postage and handling. The Woodworkers' Store, 21801 Industrial Blvd., Rogers, MN 55374.

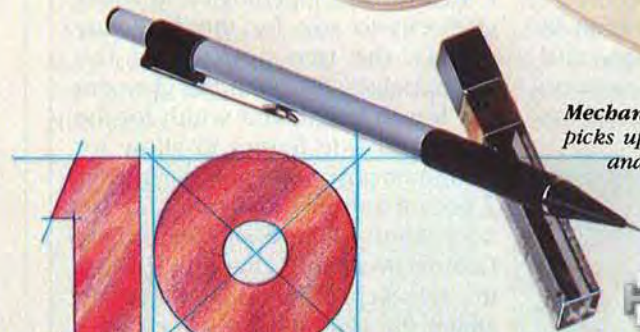
•  **$\frac{1}{4}$ " cherry plywood.** Four pieces  $24 \times 48$ " for parts G and H. \$53 ppd. from The Woodworker's Dream, 510 Sycamore St., Nazareth, PA 18064; 800-247-6931 (in Pennsylvania 215/759-2837). 🌲


Produced by Marlen Kemmet  
Project Design: James R. Downing  
Photographs: Bob Calmer  
Illustrations: Mike Henry, Bill Zaun

*French Curves: Draw smooth curves for scroll saw patterns with these drawing tools.*



*Mechanical Pencil: This 5-mm model picks up where wood pencils leave off and fits the compass shown below.*



 Print this article

# LAYOUT TOOLS

*No woodworker should be without*

Many woodworking projects call for the woodworker to “mark a radius,” “scribe a circle,” “trace a pattern,” or any number of other operations. And yet, many woodworkers haven’t purchased the drafting tools shown here—items that will increase your accuracy and make marking and measuring chores routine.

**D**raftsmen rely on specialized layout tools to produce top-quality work. In their business, it’s not good enough to be “almost-on.” They’ve got to be exact. And so do woodworkers.

### THE BASIC SEVEN

**Mechanical Pencil.** For precision in tracing patterns and marking cutoff lines, it’s tough to beat the consistent, fine line of a mechanical pencil.  
**Plastic Eraser.** Not all erasers are created equal. Plastic erasers won’t abrade paper or leave a fuzzy line behind. On wood, a plastic eraser gets into the grain without leaving a mark or residue.

**French Curves.** These ingenious tools have nearly all the curves you’ll ever need to enlarge a pattern onto a grid. Just transfer the pattern’s grid intersection points to a larger grid,

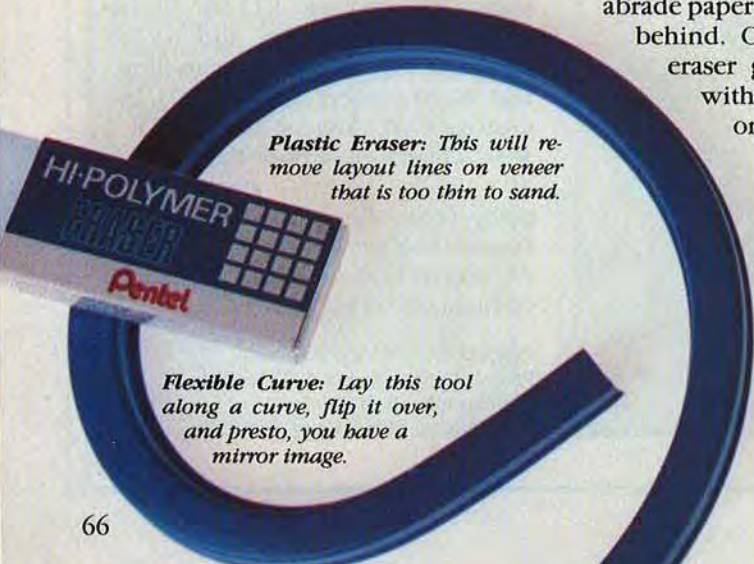
and use a french curve to connect the points. We suggest you purchase three sizes—the Alvin 351, 352, and 353 set works well—so you’ll always have the radius you need.

**Adjustable Triangle.** Because this versatile tool adjusts from 0 to 90°, it saves you the cost of buying numerous triangles, while guaranteeing accurate angle cuts every time. We like the Mars Staedtler 6” model for its quality and convenient size.

WOOD® magazine Design Editor Jim Downing knows all about the versatility of this tool. “I keep one in my shop for adjusting the table saw, band saw, radial arm saw, and drill press for precise angle cuts. I



*Compass: This model will also accept an X-acto knife for cutting thin materials, such as paper or veneer.*



*Plastic Eraser: This will remove layout lines on veneer that is too thin to sand.*

*Flexible Curve: Lay this tool along a curve, flip it over, and presto, you have a mirror image.*

**Protractor:** Adjust a sliding bevel from 90° to 180° with a protractor to set the angle of your jointer fence.

never rely solely on the machine's angle markings."

**Circle Templates.** How many times have you searched for a jar lid to draw a circle? Next time, use a circle template in combination with a mechanical pencil to get premeasured, perfectly round circles. With these two templates, you can make any of 50 different circles from 1/16 to 3".

These make drawing corner radii easy, too. If a plan calls for a 1" radius, select the 2"-diameter circle, nestle it in a corner until two edges make contact, and draw the radius.

**Protractor.** Inexpensive, but handy, a protractor provides an easy and accurate way to set a sliding bevel and check other angles.

You also can use a protractor to divide a circle into segments by dividing the necessary number of parts

into 360° (an entire circle). For example, plot the hours on the face of a clock by dividing 360° by 12; then mark hours every 30° around a circle.

**Parallel Spacer.** Making parallel lines along a straight edge is simple, but this device also allows you to parallel a curve. Place your mechanical pencil in the correct hole, and you can draw a parallel line .025 to .5" (1/40 to 1/2") from any edge.

### THREE NICE-TO-HAVE TOOLS

**Compass.** The Mars Staedtler model we've chosen draws circles up to 14" in diameter.

With a compass, you can create an infinite number of circle sizes and perform many more advanced geometric functions such as dividing an angle or drawing an ellipse.

**Flexible Curve.** You can bend this model to nearly any shape up to 20" long. Because it will retain its shape, you can transfer exact curves easily by lifting the tool and moving it.

**Matte Acetate.** Copy a pattern onto this material as with tracing paper and enjoy these advantages:

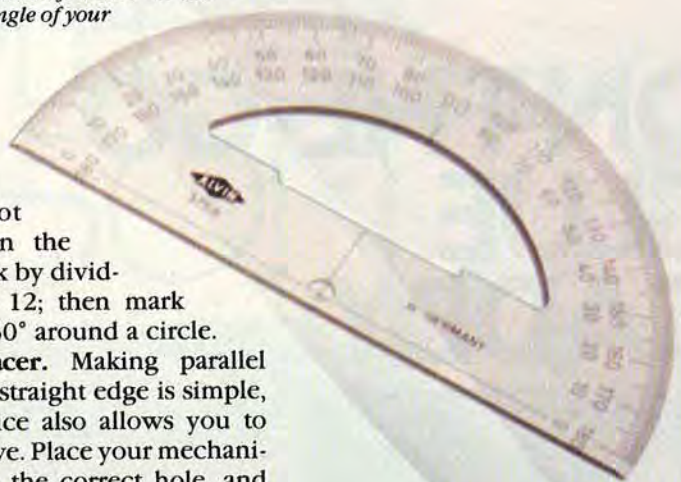
- Acetate is more durable and transparent than tracing paper.

- You can use acetate over and over to transfer patterns onto wood surfaces. Just sandwich a sheet of carbon paper between the acetate (on top) and the wood. Follow the pattern with a burnishing point to transfer a carbon image to the wood.

### HOW TO ORDER

The basic kit (mechanical pencil, \$1.98; lead refills, 80¢; eraser, 60¢; adjustable triangle, \$11; three french curves, \$6.50; two circle templates,

**Circle Templates:** The center lines on these tools make it easy to find the center of a dowel.



### Matte

**Acetate:** The pad in this kit contains 25 sheets (14x17") of .003-gauge material.

\$8.45; protractor, \$1.25; and parallel spacer, \$2.50—list price of \$33.08) is available to WOOD magazine readers for \$27 ppd.

The deluxe kit (basic kit plus compass, \$11; flexible curve, \$6.50; and matte acetate, \$13—list price of \$63.58) is discounted for WOOD readers to \$54 ppd. To order individual items, add 10 percent for shipping and handling.

Mail your check or money order (VISA and MasterCard also accepted) to the address below, and tell them WOOD magazine sent you. Items shipped via UPS.

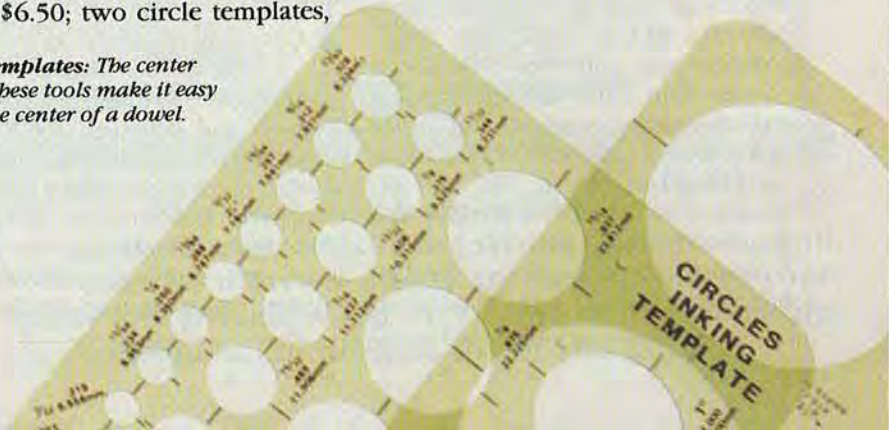
Standardblue Artworld  
924 Grand Avenue  
Des Moines, IA 50309  
Phone: 515/288-1927

Written by Bill Krier  
with James R. Downing  
Photograph: Bob Calmer



**Parallel Spacer:** You can expand this tool's use by drilling holes into it for any distance you need (up to the tool's radius).

**Adjustable Triangle:** Get perfect results every time when you measure and transfer angles with this tool.





# ON-THE-GO GLUE CADDY



Need to get your shop better organized? If so, there's no better place to start than by making our handy glue caddy. It's a cinch to build, and it won't even put a dent in your scrap pile.

## FORMING THE DISKS

**1** Cut two pieces of  $\frac{3}{4}$ " stock (we used a pine 1x12) to 11" square. If you don't have stock this wide, laminate narrower pieces.

**2** Find the center of one of the squares by marking diagonals. Mark a 10"-diameter circle at the center.

**3** Stick the two squares together, marked circle up, with double-faced tape. Cut the disks to shape.

**4** Arrange your glue bottles and accessories on top of the disks. Trace around each container. (We added 35-mm film canisters for holding cotton swabs, brushes, and other items used to apply glue into those hard-to-get-at places. We also included a foam cup for soaking the glue brushes after each use.)

**5** To prevent drilling into your drill press table, mount a piece of scrap

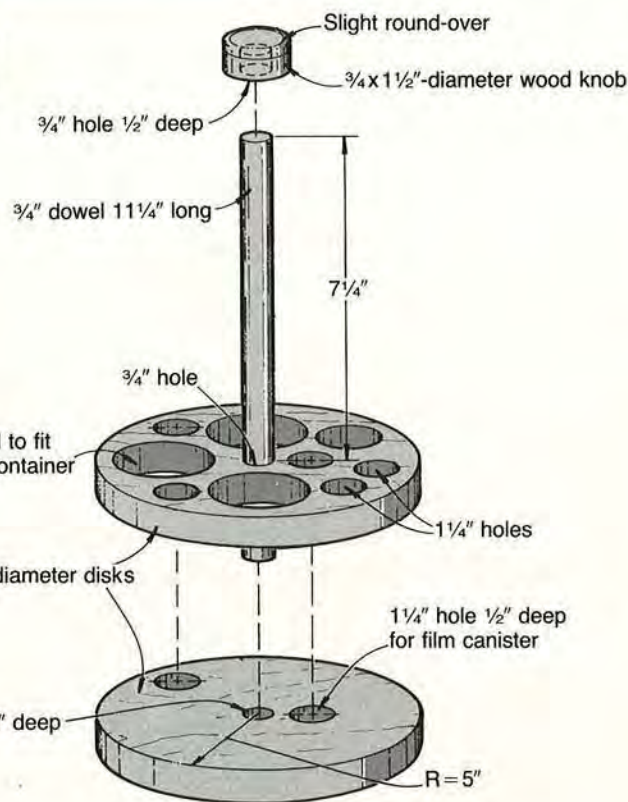
material to it. Drill a  $\frac{3}{4}$ " hole through the center of both disks. Then, if you plan on using the film canisters as shown in the photograph, switch bits, and drill  $1\frac{1}{4}$ " holes through the first disk and  $\frac{1}{2}$ " deep into the second (we used a Forstner bit). Separate the disks, and remove the tape.

**6** With the  $1\frac{1}{4}$ " bit still chucked to your drill press, drill holes through the top disk for additional film canisters. Now, using a circle cutter or hole saw, bore the larger holes as shown in the photo at *right*. Bore through the top disk and just a fraction into the scrap top mounted to your drill press table. Sand both disks and the openings smooth.

## FINISHING UP

**1** Cut a piece of  $\frac{3}{4}$ " dowel stock  $11\frac{1}{4}$ " long for the handle.

**2** Slide the top disk onto the  $\frac{3}{4}$ " dowel, and position its top face  $7\frac{1}{4}$ " down from the top end of the dowel. Mark the position of the disk (top and bottom) on the dowel. Slide the disk away from the marked lines, and apply glue between the marked lines on the dowel. Now,



We used a circle cutter for cutting the larger-diameter holes.

slide the disk back onto the glued area, turn it upside down, and run a small bead of glue around the dowel below the top disk. Later, after the top disk is firmly glued in place, glue the dowel into the  $\frac{3}{4}$ " hole in the base disk, aligning the holes in the disks.

**3** Mark a  $1\frac{1}{2}$ " circle on a piece of  $\frac{3}{4}$ " stock for the knob. Bore a  $\frac{3}{4}$ " hole  $\frac{1}{2}$ " deep at the center point. Cut the knob to shape on a band saw, sand smooth, and glue it to the top end of the dowel. Apply a clear finish to all the parts. ♣

Project Design: Jim Boelling

Photographs: Bob Calmer

Illustrations: Kim Downing; Bill Zaun

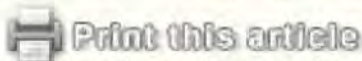
LOOK  
AHEAD  
TO THE

# HOLIDAY SEASON



This year, take a tip from these busy little elves. Start building your gifts now, and you'll be done in plenty of time to enjoy your family and friends when they come calling. Here are six people-pleasing projects to get you going.

# ROLL OUT THE WHEEL

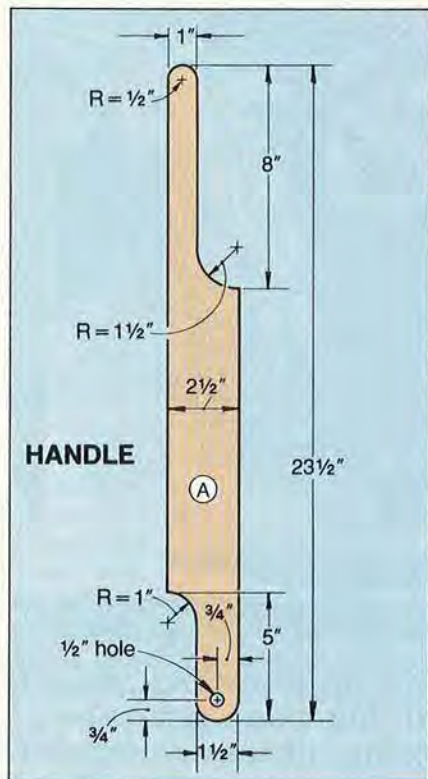


Children have carted everything from sand to dollies in our wee wheelbarrow. In fact, kids don't even mind picking up their playthings when they can push toys back to the toybox in this pint-sized hauler. Grown-ups have found this an excellent display for potted plants, too.

*Note: If you plan to use the wheelbarrow outdoors, we recommend using a slow-set epoxy and an exterior paint for durability.*

## BUILD THE FRAME AND BOX

1 Rip and crosscut two pieces of  $\frac{3}{4}$ "-thick pine to  $2\frac{1}{2} \times 23\frac{1}{2}$ " for the handles (A). Stick the handles together face to face with double-faced tape, keeping the edges and ends flush. Using the dimensions on the Handle Drawing below, lay out the handle outline on one of the pieces. Cut and drum-sand the

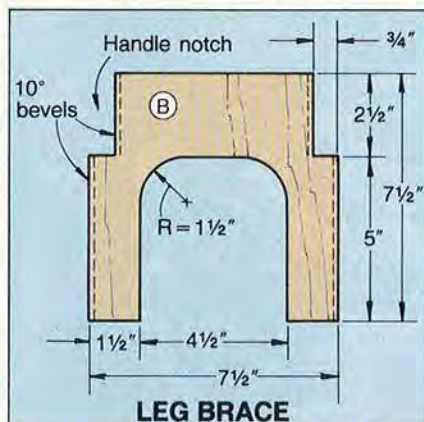


handles to shape. Separate the two handles and remove the tape.

2 Cut a piece of  $\frac{3}{4}$ "-thick pine  $7\frac{1}{2}$ " wide by at least 12" long for the leg brace (B). Tilt your table saw blade  $10^\circ$  from center, and bevel-rip both side edges of the leg brace. Cross-cut the leg brace to finished length ( $7\frac{1}{2}$ "). Rout a  $\frac{1}{4}$ " round-over along the bottom edge of the brace.

3 Using the dimensions on the Leg Brace Drawing, mark the location of the U-shaped opening and handle notches. Cut the opening to shape. To cut the angled notches, mark a line for the notch width ( $\frac{3}{4}$ ") and length ( $2\frac{1}{2}$ "). Align a sliding T-bevel against the  $10^\circ$  bevel cut earlier. As shown in the photo below, use a T-bevel to mark the angle of each notch. Clamp the leg brace in a vise. Cut the notches to shape with a handsaw.

4 Cut the front brace (C) to size, bevel-cutting the ends at  $10^\circ$ . Glue and nail the frame together, using the dimensions on the Exploded-View Drawing to locate the braces.



Mark the angled notches on top of the leg brace with a sliding T-bevel.

5 Cut the box bottom (D), front (E), and sides (F) to size. Lay out the 2" radius on the back upper corner of each side piece, and cut both pieces to shape. Glue and nail the box together.

6 Glue and nail the box to the frame, checking that the back edge of the box is flush with the back edge of the leg brace and centered from side to side on the handles.

7 Set the nails, fill the nail holes with putty, and sand smooth.

## FORM AND FIT THE WHEEL

1 To make the wheel (G), cut a  $7 \times 7$ " square from  $\frac{3}{4}$ " pine stock. Mark diagonals to find center. With a compass, mark a 6"-diameter circle on the stock. Now, using a band saw or jigsaw, cut slightly outside the marked outline, and then sand to the line for finished shape.

2 Rout a  $\frac{1}{4}$ " round-over along both of the wheel edges. Bore a  $\frac{9}{16}$ " axle through the wheel center. Cut a  $\frac{1}{2}$ " dowel 2" long for the axle.

3 To minimize chip-out, position a piece of scrap between the handles, and drill the  $\frac{1}{2}$ " axle hole through the handles where located on the Handle Drawing.

4 To enlarge the wheel opening between the handle, position a piece of  $\frac{3}{4}$ "-thick stock against the front of the box and centered between the handles as shown below.



Mark the wheel opening on the top edge of the handle fronts.



# BARROW OF FUN

Mark the wheel opening onto the handle tops.

**5** Using a handsaw, cut the handle fronts where marked to allow wheel clearance. Slip a sanding belt over the  $\frac{3}{4}$ " scrap, and sand between the handle ends as shown *below*. Sand until the wheel and two flat washers fit loosely in the opening.



After cutting, hand-sand the opening to accommodate the washers and wheel.

**6** Finish-sand, and apply a coat of sanding sealer to all the parts. Then, paint or stain as desired.

**7** Later, position the wheel (G) and washers between the handle ends, and nail the axle in place. 🌲

Project Design: Dave Ashe  
Photographs: Bob Calmer, Hopkins Associates

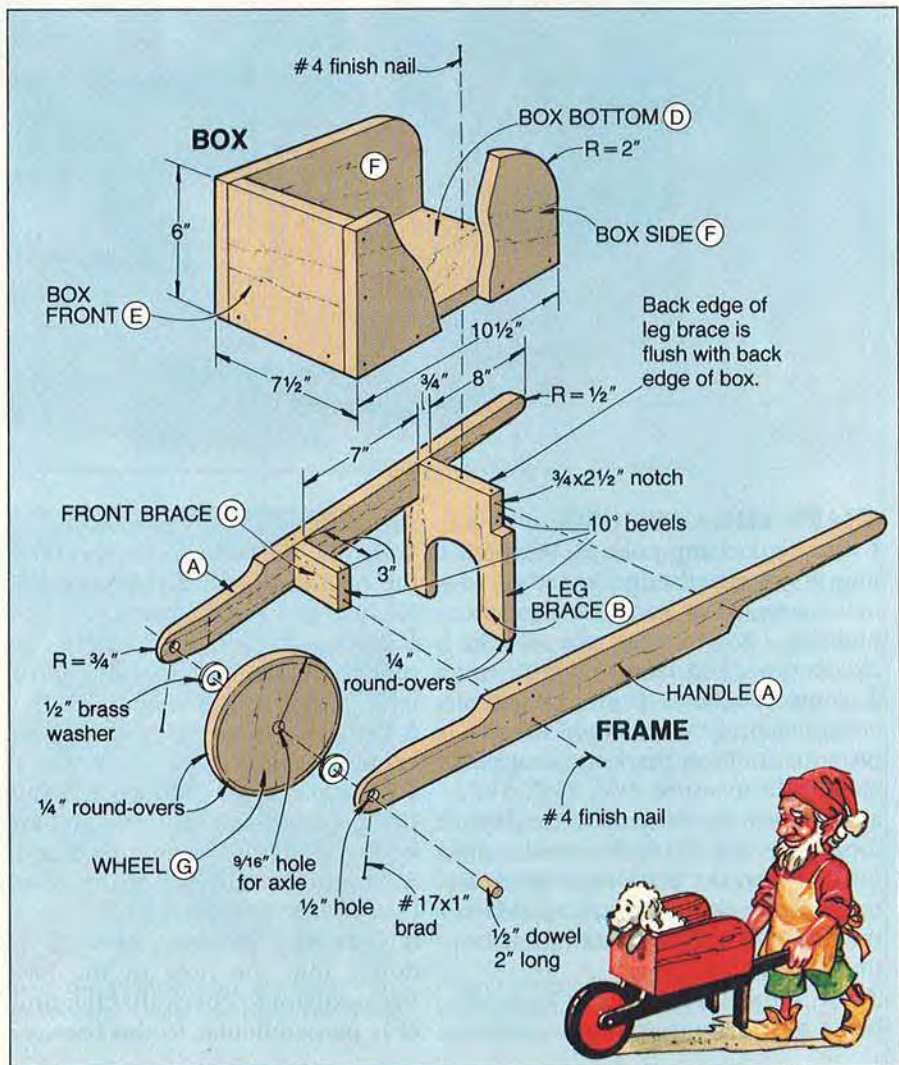
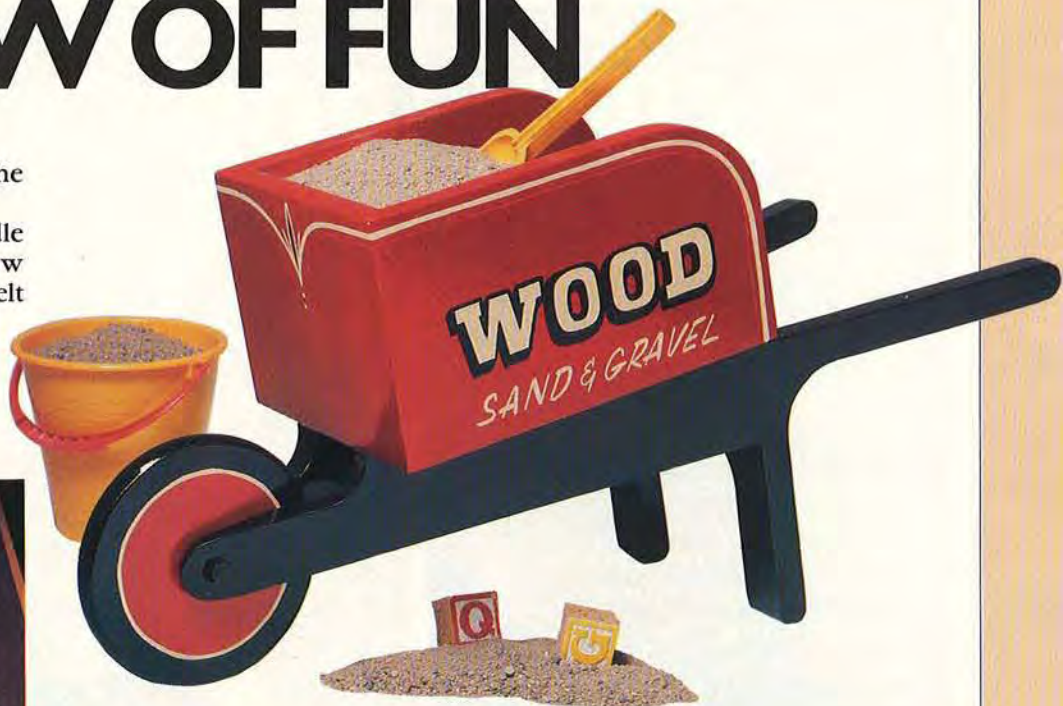
Illustrations: Kim Downing, Bill Zaun

## Bill of Materials

Part	Finished Size*			Material	Qty.
	T	W	L		
A	$\frac{3}{4}$ "	$2\frac{1}{2}$ "	$23\frac{1}{2}$ "	pine	2
B*	$\frac{3}{4}$ "	$7\frac{1}{2}$ "	$7\frac{1}{2}$ "	pine	1
C	$\frac{3}{4}$ "	$2\frac{1}{2}$ "	3"	pine	1
D	$\frac{3}{4}$ "	6"	$9\frac{3}{4}$ "	pine	1
E	$\frac{3}{4}$ "	6"	6"	pine	1
F	$\frac{3}{4}$ "	6"	$10\frac{1}{2}$ "	pine	2
G*	$\frac{3}{4}$ "	6" diameter		pine	1

\*Parts marked with an \* are cut larger initially, and then trimmed to finished size. Read the instructions before cutting.

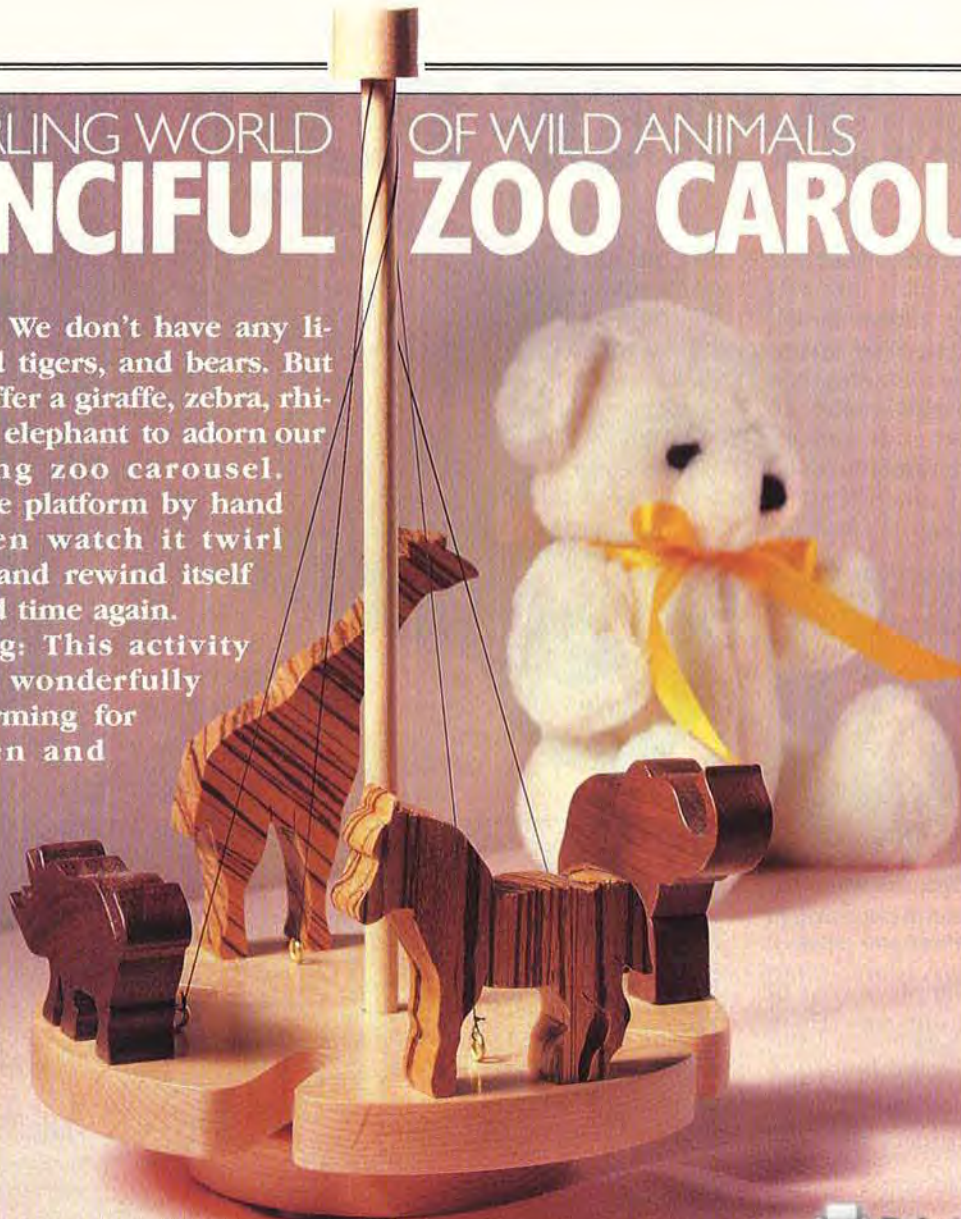
**Supplies:** double-faced tape, #4 finish nails,  $\frac{1}{2}$ " dowel, two  $\frac{1}{2}$ " brass flat washers, #17x1" brad, wood putty, glue or slow-set epoxy, stain or paint.




# WHIRLING WORLD OF WILD ANIMALS FANCIFUL ZOO CAROUSEL

Oh my! We don't have any lions, and tigers, and bears. But we do offer a giraffe, zebra, rhino, and elephant to adorn our spinning zoo carousel. Wind the platform by hand and then watch it twirl around and rewind itself time and time again.

**Warning:** This activity may be wonderfully habit-forming for children and adults.



 [Print this article](#)

## SHAPE THE CAROUSEL

**1** Glue and clamp enough  $\frac{3}{4}$ "-thick maple together edge to edge to make a board at least  $9 \times 9$ " for the platform (A). Later, scrape off the excess glue, and trim to  $9 \times 9$ ".

**2** Draw diagonals from corner to corner to find the center of the maple square. Then, mark the four circles (radii measure  $2\frac{1}{4}$ ",  $2\frac{1}{2}$ ",  $3\frac{1}{4}$ ", and  $4$ " where shown on the Platform Drawing. Mark the small radii ( $\frac{1}{4}$ ",  $\frac{3}{4}$ ") on the platform where dimensioned on the drawing. Mark the four screw eye center points on the  $2\frac{1}{2}$ " radius.

**3** Use a band saw fitted with a  $\frac{1}{8}$ " blade to cut the platform to shape.

Drum-sand the curves smooth.

**4** Drill a  $\frac{7}{16}$ " hole in the center of the platform. Drill a  $\frac{1}{16}$ " pilot hole  $\frac{3}{8}$ " deep for each screw eye.

**5** Mark a  $4\frac{1}{2}$ "-diameter circle on a piece of  $\frac{3}{4}$ "-thick maple for the base (B). Cut it to shape.

**6** Drill a  $\frac{3}{8}$ " hole  $\frac{1}{2}$ " deep into the center of the base.

**7** Cut a piece of  $\frac{3}{8}$ " dowel 12" long. Using a band saw, cut two  $\frac{1}{16}$ " saw kerfs  $\frac{1}{4}$ " deep, perpendicular to each other in the end of the dowel (see the Dowel Detail).

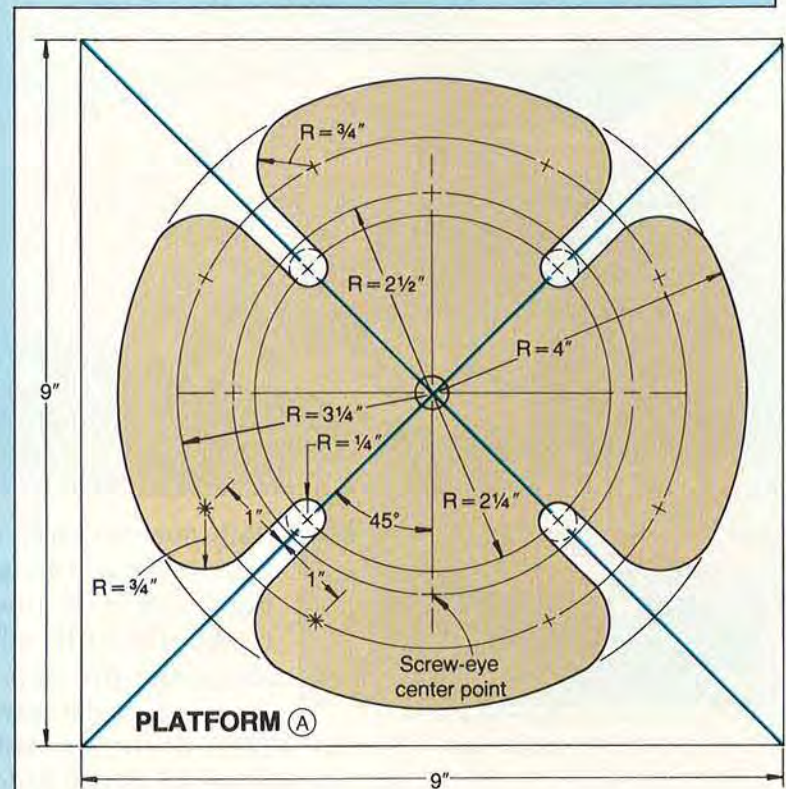
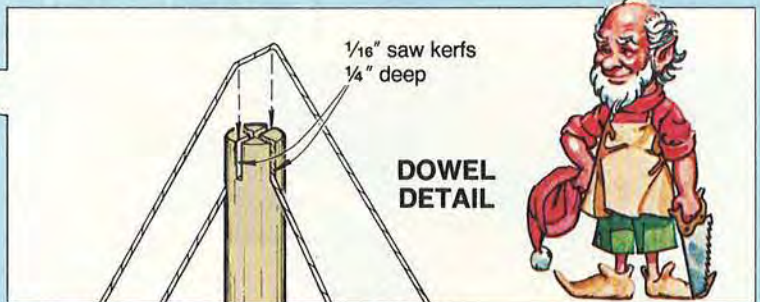
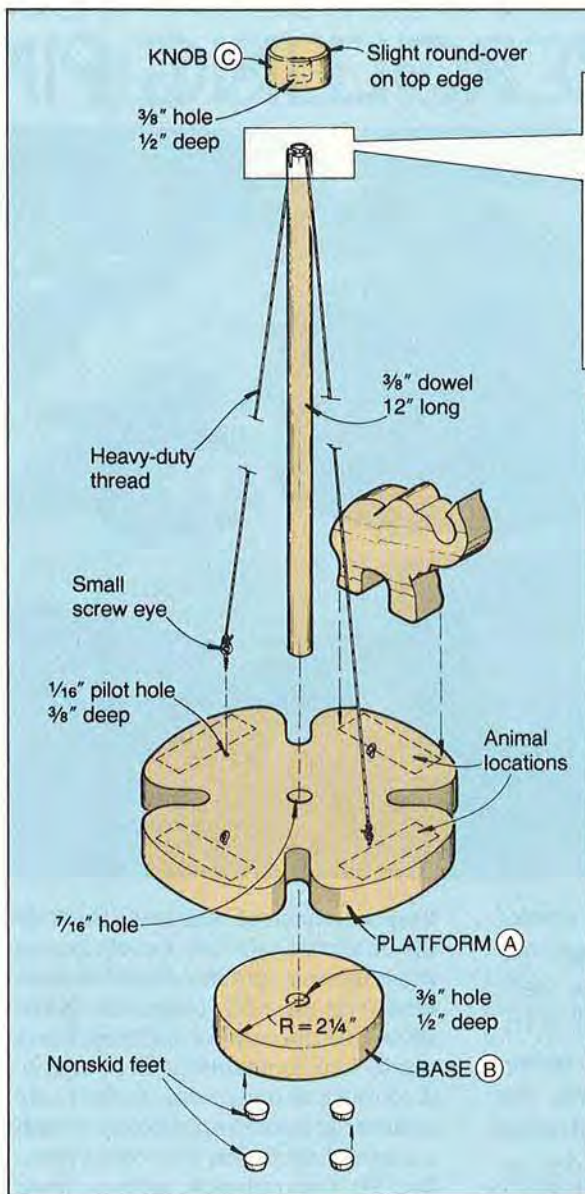
**8** Glue the unkerfed end of the dowel into the hole in the base. Use a square to check that the dowel is perpendicular to the base.

**9** To make the knob (C), mark a 1"-diameter circle on a piece of  $\frac{3}{4}$ "-thick maple. Drill a  $\frac{3}{8}$ " hole  $\frac{1}{2}$ " deep at the center of the marked circle. Now, cut the circle to shape. Sand a slight round-over along the top edge of the knob.

## AND NOW, THE ANIMALS

**1** Using tracing paper, transfer the full-sized animal patterns on page 91 to  $\frac{3}{4}$ "-thick stock, noting the grain direction on the patterns. (We used walnut for the elephant and rhino, and zebrawood for the zebra and giraffe for contrast.)

**2** Cut the animals to shape. Sand the band-sawed animal edges.



### FINAL ASSEMBLY

**1** Sand all parts of the project. Mix and place a dab of epoxy on the bottom of the feet of all the animals. Position the animals on the platform, and let the epoxy cure.

**2** Apply self-adhesive rubber or cork feet (also called bumpers) to the bottom of the base to prevent the base from slipping when the platform is wound up. Apply finish.

**3** Position two 1/4"-thick spacers on the top of the base, and slide the platform down the dowel onto the spacers. Using heavy-duty thread, tie the thread to one screw eye. Pull the thread through a saw kerf in the top of the dowel, snug it up,



Support the platform on the base with scrap spacers. Hang the platform from the center dowel.

and tie it to the opposite screw eye. As shown in the photo at left, repeat for the second thread, keeping an equal tension on both threads.

**4** Remove the spacers, and add the knob to the top of the dowel. Rotate the platform several revolutions and let it twirl. After you're done playing with it, call the kids.

**Supplies:** 4-small screw eyes (we used Stanely 8450-212 1/2 eyes, 1 3/16" long with a 3/16" inside eye diameter), heavy-duty thread or nylon fishing line, nonskid feet. 🪵

Project Design: William Warrick  
Photographs: Bob Calmer, Jim Kascoutas  
Illustrations: Kim Downing, Bill Zaun

# YOU'LL BE ROLLIN' IN THE DOUGH WITH OUR TURNED ROLLING PIN



Roll out pastries, cookies, or bread dough in high style with this hefty maple rolling pin adorned with easy-rotating walnut handles. As an added bonus, build our wall-mounted maple holder to display your lathe skills and keep the rolling pin within arm's reach.

*Note: You'll need thick stock to make this project. You can either laminate thinner stock to the sizes listed in the Bill of Materials or use the Buying Guide on page 76. We've called the folks at Constantine's, and they've put together a rolling-pin kit for you.*

## ROUGH-SHAPE THE BARREL

- 1 Cut a 3x3" maple turning square to 11½" long for the barrel (A).
- 2 Mark diagonals on each end of the barrel to locate centers. On one end, draw a 2¾"-diameter circle.

Remove most of the stock *outside* the marked circle by bevel-ripping the edges using a table saw with its blade set at 45°. (Use the circle drawn on the end of the barrel as a guide when trimming the waste.)

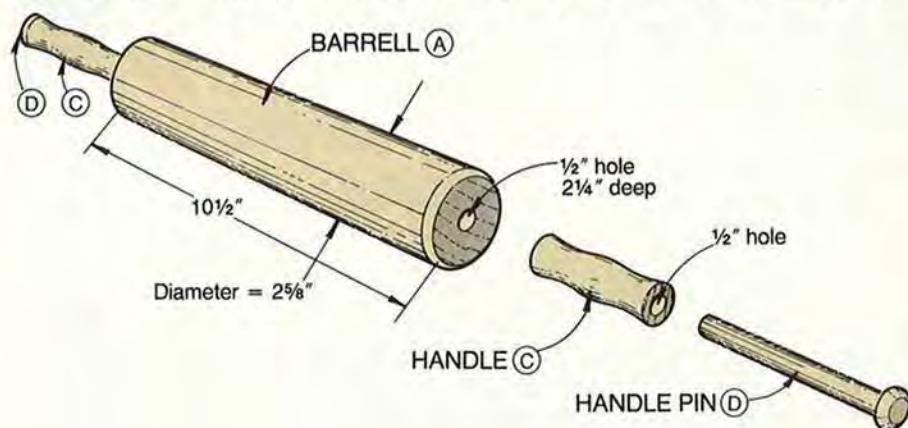
3 Remove the spur center from the lathe headstock, and replace it with a chuck fitted with a ½" brad-point bit. Fit the tailstock with a cone center. Move the tailstock next to the barrel, and align the marked center point on the end of the barrel with the brad-point bit. Using a handscrew clamp, clamp the barrel level as shown below.



Drill a ½" hole 2½" deep centered in each end of the maple barrel.

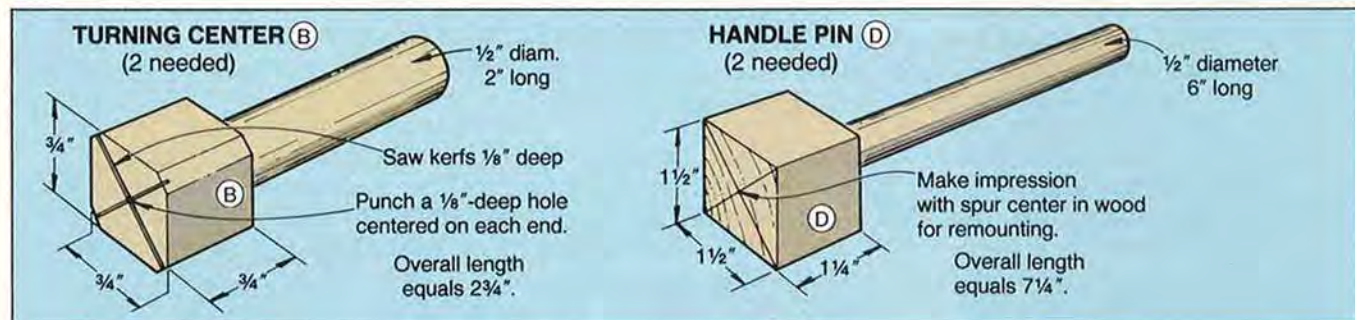


# AND STORAGE RACK



Bill of Materials					
Part	Finished Size*			Materials	Qty.
	T	W	L		
<b>ROLLING PIN</b>					
A*	2 5/8" diam.	10 1/2"		maple	1
B	3/4"	3/4"	2 3/4"	hardwood	2
C*	1 1/8" diam.	4"		walnut	2
D*	1 1/8" diam.	6 1/4"		maple	2
<b>STORAGE RACK</b>					
E	3/4"	2 5/8"	18"	maple	1
F	3/4"	2 5/8"	3 1/4"	maple	2

\*Parts marked with an \* are cut larger initially, and then trimmed to finished size. Please read the instructions before cutting.  
Supplies: nontoxic finish.



**4** With the lathe set at its slowest speed, drill a 2 1/2"-deep hole in the barrel. You'll need to turn the lathe off periodically, remove the shavings, and then resume drilling. (We wrapped tape on the bit to ensure drilling to an accurate depth.) Turn the barrel-clamp assembly around, and fit the hole just drilled onto the cone center. Check that the bit aligns with the marked center point, and drill a second 2 1/2"-deep hole. Set the barrel aside for now.

## MAKE 2 TURNING CENTERS

**1** Cut two pieces of 3/4" hardwood to 3/4" square by 2 3/4" long for the turning centers (B). Mark diagonals on both ends of each piece to locate centers. On *one* end of each turning center, cut kerfs 1/8" deep along each marked diagonal with a hand saw. Punch a hole about 1/8" deep in the center of each end of each turning center with an awl or center punch.

**2** Mount one of the turning centers between centers on the lathe, and turn the stock to the shape and size

shown on the Turning Center Drawing. Now, sand the shank portion of the turning center to 1/2", checking the diameter often with an outside caliper to make sure you end up with a snug fit in the 1/2" hole in the barrel. Repeat for the second turning center.

## FINISH-TURNING THE MAPLE BARREL

**1** Push the turning centers into the holes in the barrel. Mount the assembly between centers. Start the lathe, and turn the barrel to a cylinder 2 5/8" in diameter.

**2** Trim each end of the barrel with a parting tool for a finished-barrel length of 10 1/2". Be careful to stop the cut once the parting tool makes contact with the turning center.

**3** Using a sanding block, sand the barrel to remove any waviness. Sand the ends smooth, sanding a slight round-over on the corners.

**4** Apply a liberal coat of cooking oil to the barrel, and let the oil soak in for a few minutes. Wipe off any excess oil with a clean rag. Turn

your lathe on, and polish the barrel to a high luster by holding a clean white rag against the wood. Repeat with a second coat of oil.

## SHAPE THE WALNUT HANDLES AND MAPLE PINS

**1** Cut two pieces of 1 1/2"-thick walnut to 1 1/2" wide by 4 1/8" long for the handles (C). Mark diagonals on each end of each handle to locate centers. Clamp one of the handle blanks in a handscrew clamp. Check that the handle blank is square with the drill press table. Then, center and drill a 1/2" hole through the length of each handle. (To keep the bit from wandering, we used a brad-point bit.)

**2** Cut two pieces of 1 1/2"-thick maple to 1 1/2" wide by 7 1/4" long for the pin blanks (D).

**3** Mount one of the pin blanks between centers, and mark a reference line 1/4" from the headstock end. Turn the pin to the shape shown *above*. Spot-glue one of the handle blanks onto a handle pin (we used hot-melt glue).

*Continued*

# ROLLING PIN AND STORAGE RACK

**4** Mount the handle and pin assembly between centers using the marks on the drive center and pin to locate their original position. Turn the handle to the shape shown on the Handle Drawing *below*. True up the end of the handle nearest the tailstock. Sand the handle, and apply an oil finish.

**5** Separate the handle from the pin by cutting the glue joint with your parting tool. Stop the cut as soon as you cut through the walnut.

**6** Remove the handle from the pin and remount the handle pin between centers. Sand the handle-pin shaft so the handle will turn easily on the pin shaft. (We stopped the lathe several times to check the fit of the handle on the handle pin.) Shape the end of the handle pin where shown on the Exploded-View and Handle drawings.

**7** Place the handle on the pin, and remount them between centers.

Sand the head of the pin to the same diameter as the end of the handle (see the Handle Drawing). Finally, use your skew to cut the pin free. Sand the rounded end of the pin smooth.

## FINAL ASSEMBLY

**1** Apply oil to the inside of the hole in each handle (C) and to the ends of the handle. Apply oil to all but the 2" of the pin (D) that will be glued into the barrel.

**2** Spread a light coat of glue in the holes in the barrel (we used a cotton swab). Slip the handles on the pins, and carefully tap the pins in place, leaving just enough play for the handles to turn freely. Immediately back out slightly if too tight.

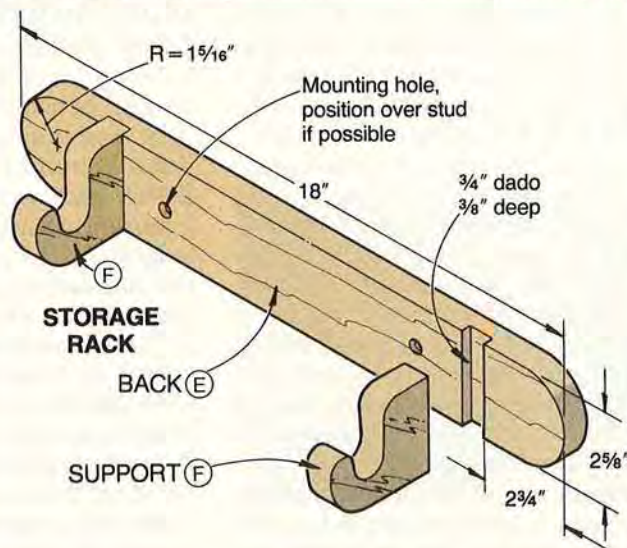
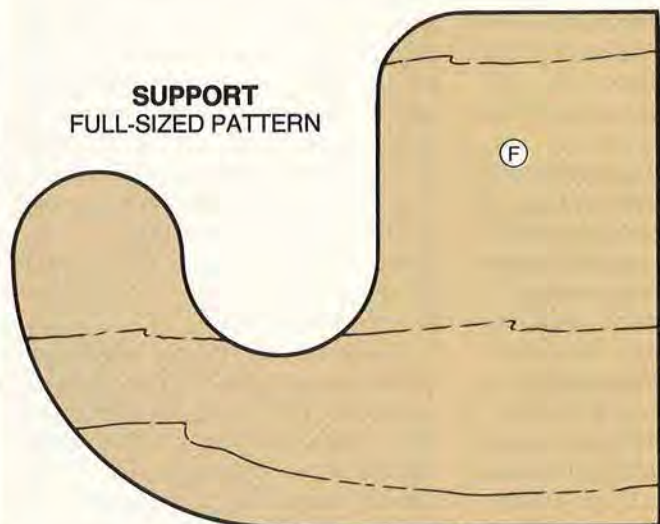
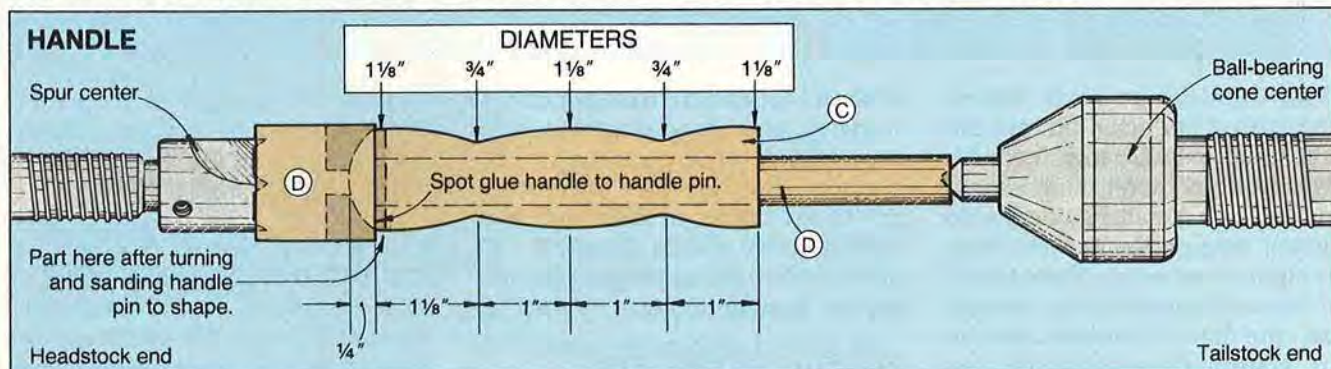
## BUILDING THE MAPLE STORAGE RACK

We were so impressed with the good looks of the rolling pin, we

decided to add a wall-mounted storage rack. To make the maple rack, cut the back (E) and supports (F) to the sizes listed in the Bill of Materials. Mark the radii on the back piece, and cut it to shape. Now, mark the location, cut two dadoes, and drill the holes in the back where shown on the Storage Rack Drawing *below*. Use carbon paper to transfer the full-sized pattern onto the two support pieces (F). Cut the supports to shape, sand smooth, and glue them into the dadoes. Finish-sand, apply the finish, and hang.

## BUYING GUIDE

• **Rolling pin kit.** 1½x1½x12" walnut, 3x3x12" maple, 1½x1½x18" maple. Kit no. WD988, \$10.50 ppd.. Constantine's, 2050 Eastchester Rd., Bronx, NY 10461. To order, call 800-223-8087 (800-822-1202 in New York).

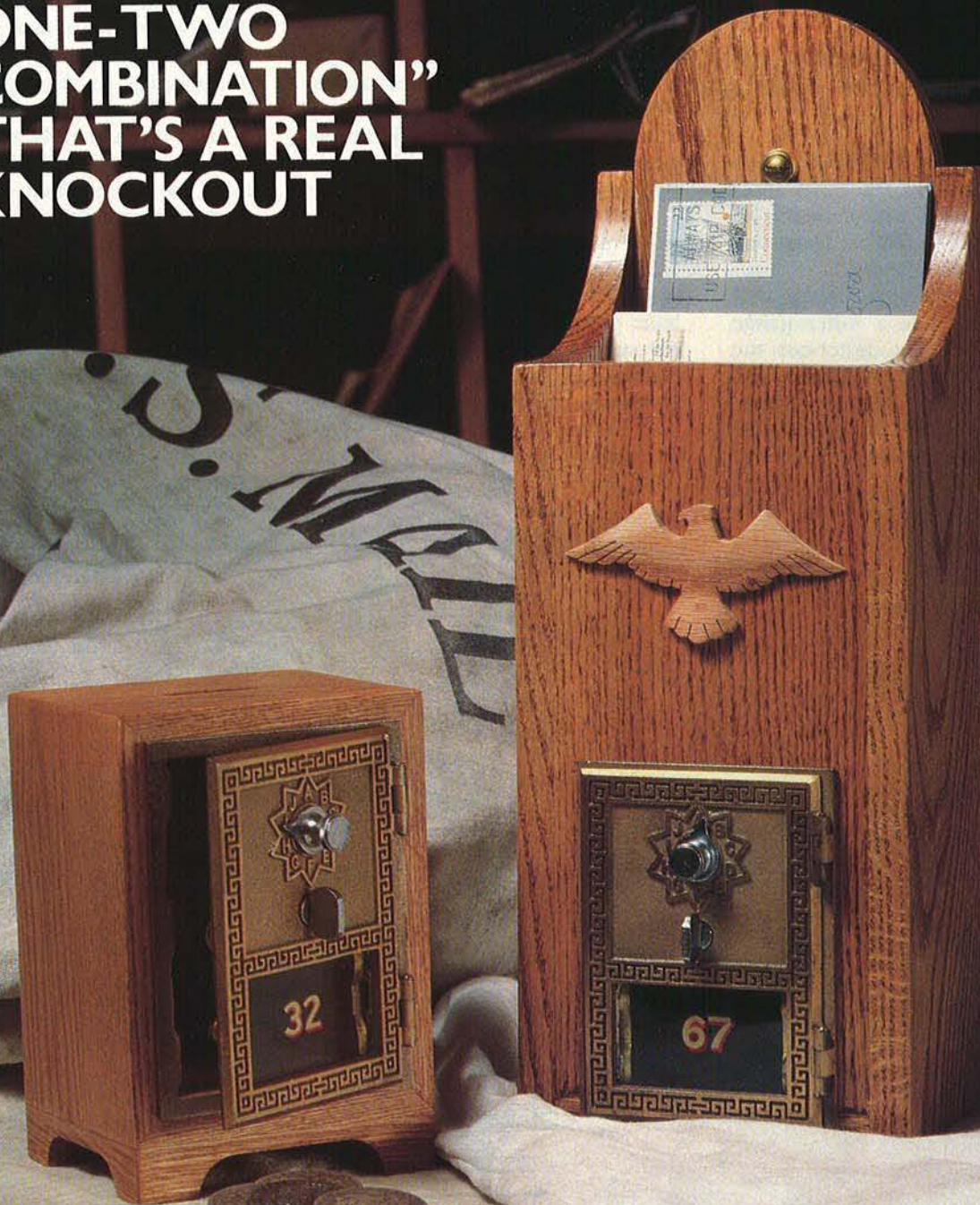


Project Design: Walt Becker


Photographs: Hopkins Associates

Illustrations: Mike Henry, Bill Zaun

# HERE'S A "ONE-TWO COMBINATION" THAT'S A REAL KNOCKOUT



Refurbished post office lockbox doors add just the right amount of nostalgia to these handsomely useful projects. On the following two pages, we'll show you how to build the safe and letter box.

 [Print this article](#)

# THE MINI SAFE A PROJECT YOU CAN BANK ON

Kids will love saving for tomorrow in an oak safe highlighting one of yesteryear's treasures—a genuine brass lockbox door. The restored brass door—salvaged from one of America's post offices—comes complete with a working combination.

## FIRST, MAKE A BASIC BOX

**1** Cut a piece of 1/2"-thick oak to 4" wide by 24" long. Cut or rout a 1/4" groove 1/4" deep and 1/4" from one edge of the oak strip.

**2** Tilt your table saw blade 45° from center. Using a miter gauge fitted with a fence, miter-cut the sides (A) and top and bottom (B) to length from the 24"-long strip

**3** Using the dimensions on the drawing, mark the slot on the top

face of the top piece (B). Drill a 1/4" hole at each end of the slot. Using a 3/16" bit, drill out the waste material between the two 1/4" holes. Then, chisel the slot to shape, or cut it to shape with a scroll saw.

**4** Cut the box back (C) to size from 1/4" oak or lauan plywood.

**5** Glue and clamp the box assembly together. (We used masking tape to hold the mitered joints together, and then pulled the joints tight with a band clamp.)

## ADD A BASE

**1** Cut a piece of 1/2"-thick oak to 3/4" wide by 24" long. Miter-cut the base pieces (D, E) to length from the strip. Mark the opening on the four pieces to form the feet where shown on the drawing below.

**2** Cut the base pieces to shape. (We cut ours on a band saw fitted with

a 1/8" blade.) Sand the rounded corners smooth with a 1"-diameter drum sander.

## PUTTING IT ALL TOGETHER

**1** Glue and clamp the base pieces to the bottom of the box.

**2** Position the door and drill 3/8"-deep holes in the opening. The holes will be slightly angled.

**3** Sand the assembly smooth. Stain and finish as desired. Screw the door in place. Then, empty your pocket change into the bank.

## BUYING GUIDE

• **Post office lockbox door.** Grecian style with two-digit decal. Reconditioned doors shipped with three-letter combination. \$19 ppd. for one door, \$36 ppd. for two. Streeter Company, P.O. Box 241, Sturgeon, MO 65284.

Part	Finished Size			Material	Qty.
	T	W	L		
A	1/2"	4"	4 1/2"	oak	2
B	1/2"	4"	4 3/16"	oak	2
C	1/4"	3 5/8"	3 15/16"	oak ply.	1
D	1/2"	3/4"	4 3/16"	oak	2
E	1/2"	3/4"	4"	oak	2

**Supplies:** #4x3/8" flathead wood screws, stain, finish.



# BILL BOX AND KEY KEEPER THE RIGHT COMBINATION

Staying organized in this day and age isn't easy. But with this project, you'll at least know the whereabouts of those ever-present bills, and be able to keep track of otherwise-elusive car keys that always seem to wander off.

*Note: See the Buying Guide on the opposite page for our source of refurbished lockbox doors.*

## CUT AND ASSEMBLE THE LETTER BOX

- 1 Rip and crosscut the back (A), front (B), two sides (C), shelf (D), and bottom (E) to the sizes listed in the Bill of Materials.
- 2 Mark, cut, and a 2¼" radius on the top of the back piece. Rout a ⅜" round-over on the top back edge of the front piece.
- 3 Using a try square, mark the door-opening location on the front

piece, and cut it to shape. Check the fit of the door in the opening.

- 4 Using double-faced tape, fasten the two side pieces (C) together face to face with the edges flush. Mark a 2¾" radius on one piece where dimensioned on the drawing, and cut and sand both pieces to shape. Remove the tape.
- 5 Mark the location, and cut a ½" rabbet ¼" deep along the bottom edge of the back (A). Using the dimensions on the drawing, mark the locations and cut a ½" dado ¼" deep in the front and back pieces. Check the fit of the shelf and bottom in the dadoes and rabbet.
- 6 Mark the location and drill pilot holes for the two cup hooks and two mounting holes for attaching the box to the wall after assembly.
- 7 With the bottom edges of the sides and back flush, glue and clamp them together. (We positioned the shelf and bottom in place to hold the assembly

square.) Glue and clamp the shelf, bottom, and front to the assembly.

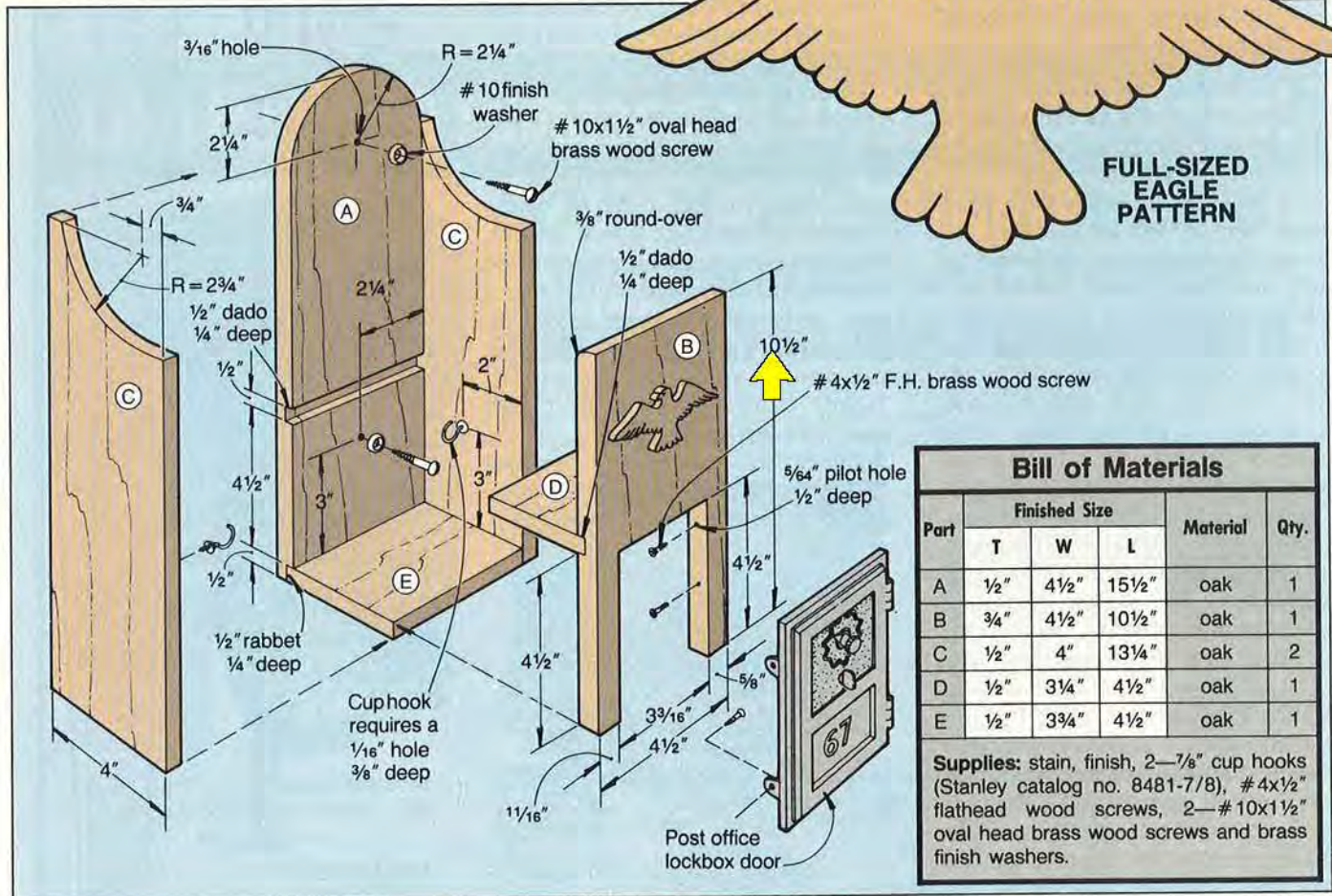
- 8 Transfer the eagle pattern below to ¼" oak stock, and cut it to shape. (We planed down a piece of ½" stock for the ¼"-thick eagle.)

## NOW, MOUNT THE DOOR AND ADD THE FINISH

- 1 Sand the box smooth. Hold the bronze door in place, and drill the angled pilot holes in the opening in the front piece. Remove the door.
- 2 Stain and finish the box. Mount the door and hang the box, centering it over a stud if possible.

*Note: If you don't want to use the combination each time you open the door, remove the lock mechanism from the back of the door. Then, remount the dial.*

Project Design: Sam Criswell  
Photographs: Jim Kascoutas  
Illustrations: Kim Downing, Bill Zaun



Part	Finished Size			Material	Qty.
	T	W	L		
A	1/2"	4 1/2"	15 1/2"	oak	1
B	3/4"	4 1/2"	10 1/2"	oak	1
C	1/2"	4"	13 1/4"	oak	2
D	1/2"	3 1/4"	4 1/2"	oak	1
E	1/2"	3 3/4"	4 1/2"	oak	1

**Supplies:** stain, finish, 2—7/8" cup hooks (Stanley catalog no. 8481-7/8), #4x1/2" flathead wood screws, 2—#10x1/2" oval head brass wood screws and brass finish washers.

# A FUN-TO-DO FREE-FORM WOOD SCULPTURE HANDCRAFTED CATTAILS AND REEDS



If you're looking for a one-of-a-kind project, you just can't miss with these cattails and reeds. Strips of birch veneer and lengths of  $\frac{1}{2}$ " and  $\frac{1}{8}$ " dowel combine to make one interesting arrangement. Use it as a centerpiece or decorative accessory.

## MAKING THE CATTAILS

*Note: The number of cattails and reeds will depend upon the size of arrangement desired.*

**1** Cut 2"-long pieces from  $\frac{1}{2}$ "-diameter dowel stock for the fruit spikes. You can use walnut dowel stock, or try birch and stain it later.

**2** To drill the holes in the fruit spikes, use an awl to make an indentation centered on each end of each dowel segment. Drill a  $\frac{1}{2}$ " hole  $\frac{1}{2}$ " deep through a scrap piece of 2x4 stock. Insert a fruit spike in the hole, center it under a  $\frac{1}{8}$ " brad-point drill bit, and drill  $\frac{1}{2}$ " into each end of each spike. (We clamped the spike in a handscrew clamp to prevent it from turning.)

**3** To round the ends of the spikes, hold a dowel segment at an angle against a belt or drum sander and rotate the spike. Adjust the angle and continue sanding. Repeat for the other end. Hand-sand smooth.

**4** Cut  $\frac{1}{8}$ " dowel stock to  $9\frac{1}{2}$ " long for the stem and 1" long for the stem tip. Sand a point on one end of each stem tip. For easy insertion into the fruit spike, sand a chamfer on the bottom end of the stem tip and top end of the stem. Glue the stem parts into the fruit spikes.

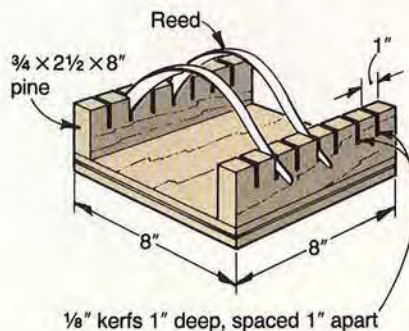
## SHAPING THE REEDS

**1** Cut  $\frac{3}{4}$ "-wide strips  $10\frac{1}{4}$ " long from birch veneer. (We used a utility knife to cut the  $\frac{1}{28}$ " veneer.)

**2** Hold 3 strips together face to face, and sand to shape (we used a belt sander clamped in a vise). See the full-sized reed pattern at right.

**3** Immerse seven (that's all the jig will hold) of the reeds in water, and let them soak for 2 hours. While the reeds soak, construct the twisting jig shown below. One at a time, twist the wet strips into position in the jig as shown below. Let the veneer strips dry overnight. Lightly hand-sand each reed (we used 220-grit sandpaper).

**4** Repeat the soaking and bending procedure with more strips, twisting them in the opposite direction



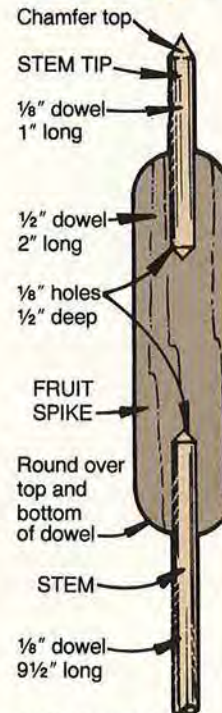
so that the completed veneer reeds curve in different directions.

**5** Leave the cattails and reeds unfinished or spray on a clear finish (we used Deft aerosol lacquer). For a more colorful effect, you might try painting the reeds with a light-green watercolor. 🌿

Project Design:  
D. A. Callaway



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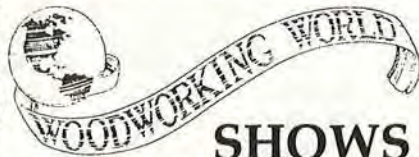
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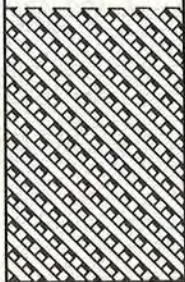
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—Steve Oswalt

(Steve Oswalt, a Des Moines woodworker, frequently contributes to WOOD magazine.)

*Bosch Edge-Beading Router Bit, sold at hardware stores nationwide. The bit we tested, No. 85631M, carries a \$28.25 suggested retail price.*



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Woodsheen, a new Minwax product, applies easily and dries quickly in two hours as advertised—two points to consider in any finish.

Minwax bills the item as a “one-step finish.” The gelled product combines a stain with a wax-like coat. However, the instructions clearly recommend two coats.

The squeeze bottle is a big plus for me—no lid to pry off and ham-

mer back on—and the gel made the product easier to apply than a normal stain. The resulting finish has a nice sheen to it, but only after applying a second coat.

—Steve Oswalt

*Woodsheen, a product of Minwax Co., available in six colors plus natural, at hardware and home supply stores nationwide. The 12-ounce bottle retails for \$4.99.*

Continued on page 84

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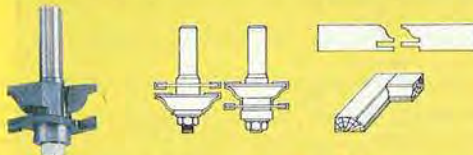
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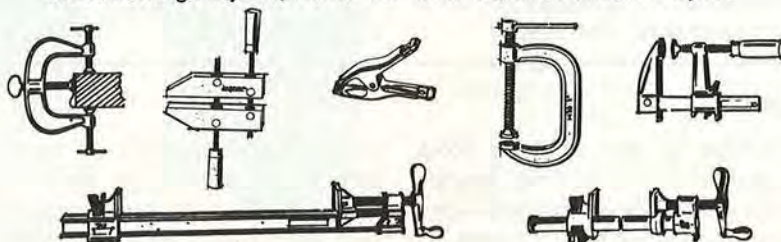
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Continued from page 83

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The high-tech plastic also reduces blade friction, extends blade life, and dampens noise. Softening my saw's high-pitched whine made it easier to concentrate on critical cuts.

The guides appear to be durable. After 90 minutes of solid use, my Cool Blocks hardly showed any signs of use. When wear does occur, the manufacturer says they can be refaced with a file.

—Steve Oswalt

Cool Blocks come in sizes to fit most band saws; all cost \$9.95 a set. The guides we tested were for a 14" Delta, order No. 33K0901, from Garrett Wade Company, the exclusive U.S. distributor. For more information write the company at 161 Avenue of the Americas, New York, NY 10013.

Continued on page 88



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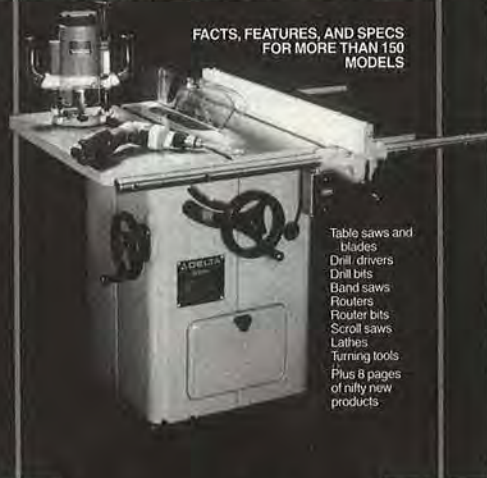


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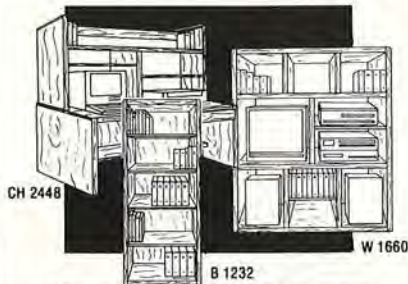
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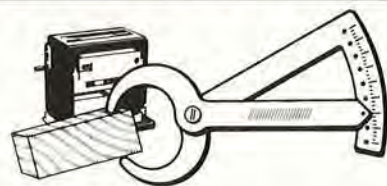


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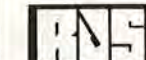
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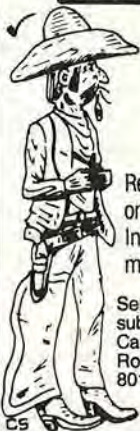
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Continued from page 84

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—Steve Oswalt

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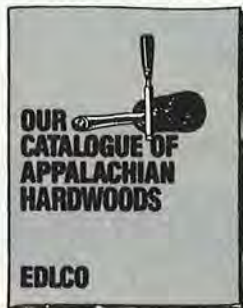
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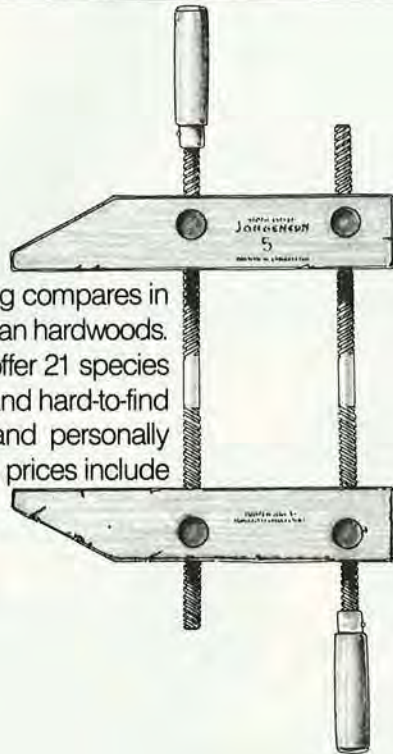
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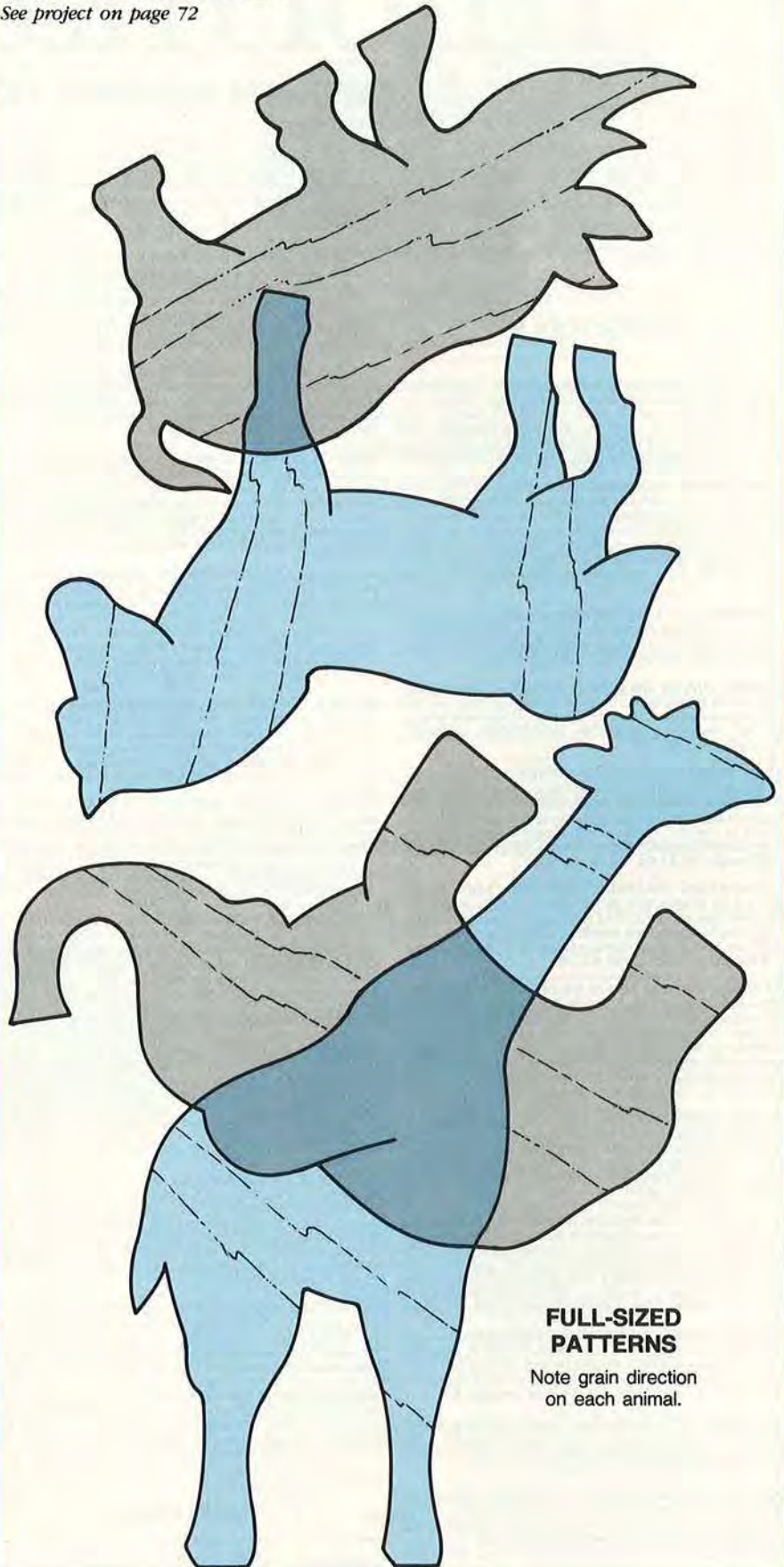


Shaker Peg

Mug Peg

**ZOO CAROUSEL**

See project on page 72



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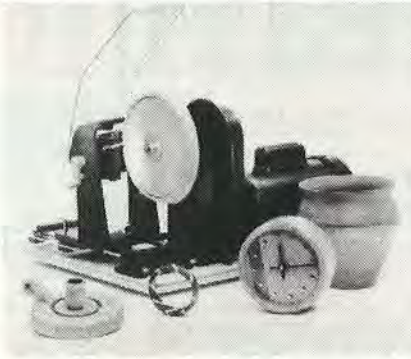
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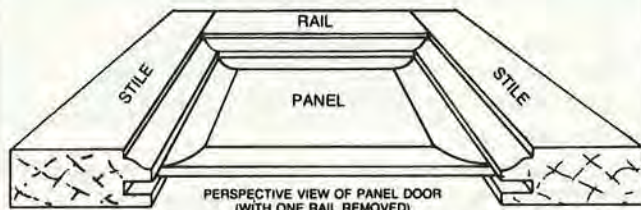
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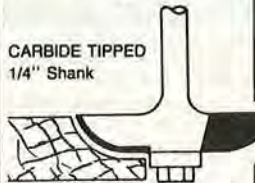


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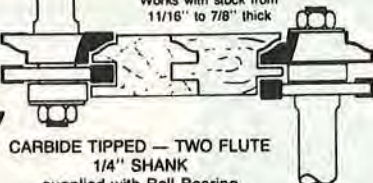
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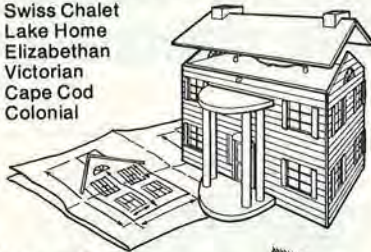
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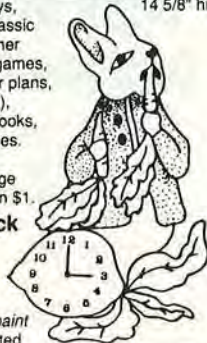
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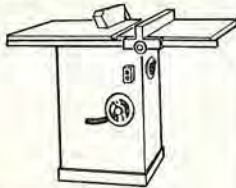
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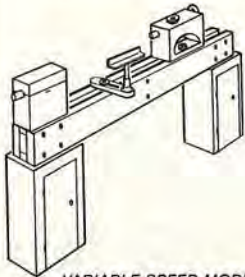
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## TOUGH ENOUGH

As winter comes on, a lumberjack adds layers of clothing to keep warm, but how does a tree fight the cold? Researchers have found that some species have a conservative strategy—they tolerate minimum temperatures no lower than the minimums they're likely to face where they put down roots. Oregon white oak, for instance, survives when the thermometer reads about  $-4^{\circ}\text{F}$ , but sustains injury if the mercury dips any lower.

Other species possess a much greater freezing tolerance than seems at all necessary. In experimental conditions, the northern white cedar, the white spruce, and the



balsam poplar defy a staggering  $-112^{\circ}\text{F}$ !

Some trees adjust to whatever fate gives them. The eastern white pine can't stand temperatures lower than  $-38^{\circ}\text{F}$  in Tennessee, yet shrugs off a bark-numbing  $-128^{\circ}\text{F}$  standing in Minnesota.

## CARVERS CONVERGE

Gas up the car. The National Woodcarvers Showcase '88 opens at Silver Dollar City, Branson, Missouri, on September 16. For two weeks, carvers meet, eat, talk, show, sell, and share. A juried competition pits carvers in two divisions and 14 categories. For more information, call 417/338-8188, or write: *National Woodcarvers Showcase, Miss Sue, Entertainment Division, Silver Dollar City, Inc., Branson, MO 65616.*

## THINNER IS BETTER

In Washington State, thinned plots of Douglas fir produced trees that yielded 7% more board feet of lumber and 22% more total wood than unthinned plots.

## GIVE HER A SAWDUST BOUQUET

How do you describe the smell of wood? In most cases, "nice" or "not so hot" prove adequate. A few types of wood, however, can be compared to scents most everyone knows. Freshly cut rosewood smells like roses. Teak smells like old shoe leather. West Indies satinwood will remind you of coconut oil, and an African species called Dahoma reeks of pure ammonia.



Don't bother with essia, another African wood. It smells like rotten cabbage.

## BUT WHEN DO THEY GO ON SALE?

When you want to show the world you have fine taste in automobiles, and the bank account to match, you might buy a Rolls-Royce. A status-conscious woodworker, however, could opt for a Reinhard table saw, a handcrafted, detailed machine definitely in the luxury class.

The 1988 price for this Swiss manufacturer's top-of-the-line table saw: \$26,950. Of course, that's with the electronic fence. If you settled for a regular fence, you could snap up the PKS350 from the U.S. importer for a mere \$20,950 (shipping not included).

Mahogany Masterpieces, the Suncook, New Hampshire-based distributor for the U.S. and Canada, sold just two Reinhard table saws last

year—one to a Wall Street executive and one to a West Coast computer company owner. However, both saws were the smaller, more economically

priced, tilt-table PKS250 model, which sells for \$15,950.

At the small Reinhard firm in Huttwil, Switzerland, Old World precision craftsmen build the saws one at a time. In addition to the no more than 10 table saws produced per year, Reinhard also makes drill presses and other wood-working machinery, and industrial equipment.

Don't wait too long to place your order. Prices of these Swiss saws shot up by as much as \$4,000 from 1987 to 1988. And, allow for an extended delivery date—limited production means a wait of 6 to 12 months. ♣



The Swiss-made Reinhard PKS250 table saw. Price: \$15,950.

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