

Better Homes and Gardens®

WOOD

THE MAGAZINE FOR HOME WOODWORKERS

\$3.50

OCTOBER 1986 • ISSUE NO. 13

Display until October 14

MORTISE AND TENON JOINERY

Use our router jig to make super-strong, snug-fitting joints

WOODWORKERS' STANDARDS

Kitchen cabinets: We give you dimensions and planning tips

BEAUTIFUL FIGURED WOODS

A close-up look at 7 of the forest's finest

PLUS THESE PROJECTS:

Cedar-lined chest

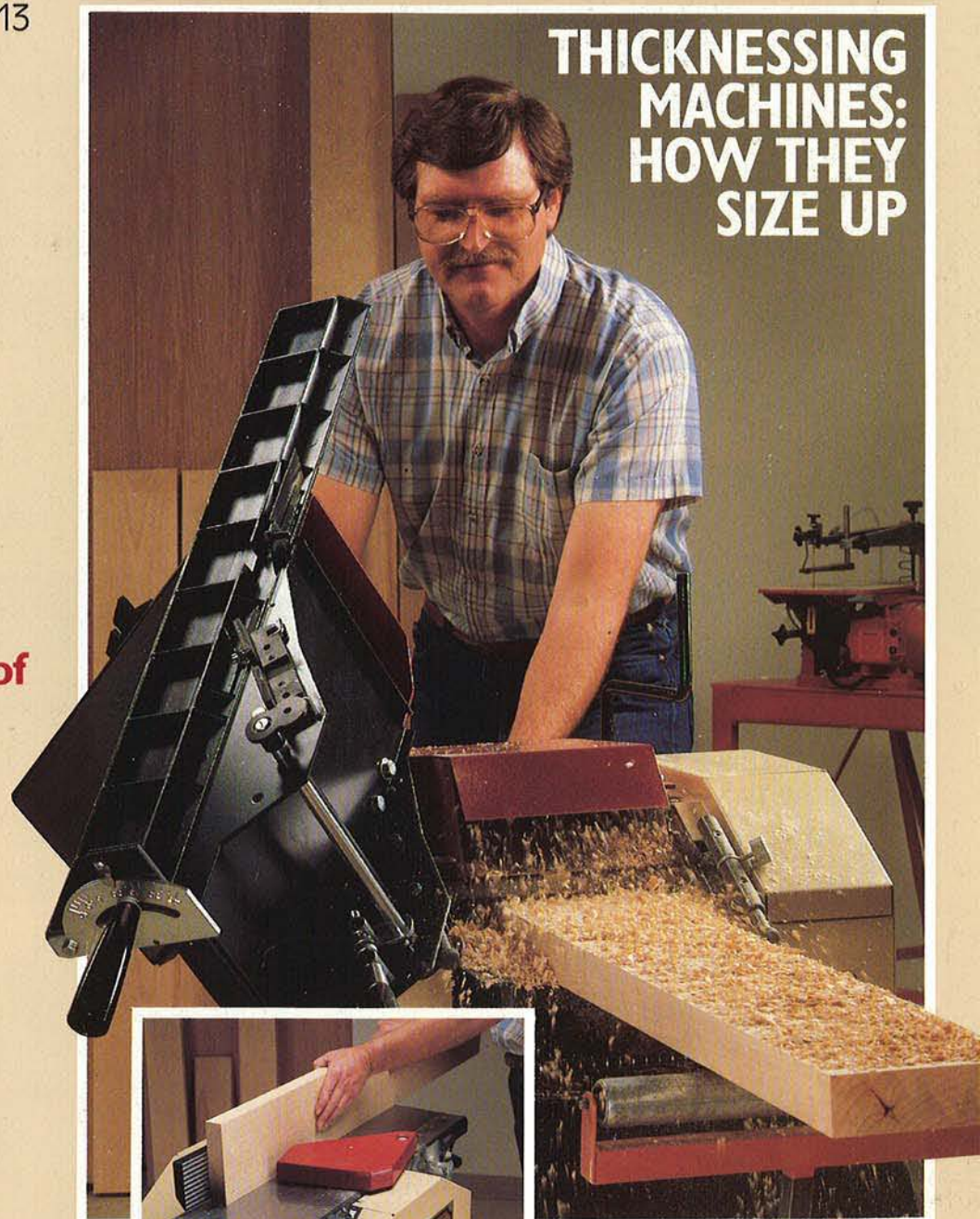
Mallard mug rack

Kids' play furniture

Jewelry case

Drum-sanding table

THICKENING MACHINES: HOW THEY SIZE UP



Big 6-page report
begins on page 56



On every Heavy Duty Wood Shaper we build between now and December, we're leaving something off.



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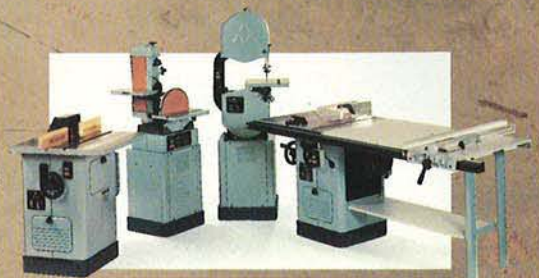
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Better Homes and Gardens®

WOOD

OCTOBER 1986

ISSUE NO. 13

WOOD PROFILE

EASTERN RED CEDAR: FAVORED FOR FRAGRANCE AND FLAVOR 31

People love it, moths hate it, and no martini would be complete without a hint of this ancient, aromatic juniper.



CRAFTSMAN CLOSE-UP

A PENCHANT FOR PERIOD PIECES 32

Besppectacled Ken Williamson of South Hadley, Massachusetts, teaches college chemistry, but his passion is the Queen Anne, Chippendale, and Federal-era reproductions he creates in his basement workshop.



SHOP-TESTED TECHNIQUES

BASIC MORTISE AND TENON JOINERY 36

Come on, give it a try! You don't have to be a pro to make this super-strong, good-looking joint — especially with our special mortising jig.



FASCINATING FIGURE: A GLIMPSE AT 7 OF THE FOREST'S FINEST 42

What makes an exquisitely figured board so unique? Here's a close-up look at bird's eye, fiddleback, burl, crotch wood, and more of these beautiful accent woods — plus the stories behind them.



AN HEIRLOOM CHEST TO CHERISH 46

Cedar lining inside and an oak frame outside make the perfect combination in this clean-lined chest, fortified with sturdy mortise and tenon joinery.



DUST-BUSTIN' DRUM-SANDING TABLE 52

This special table with its vacuum-hose attachment keeps things cleaner around the drill press, and lets you edge-sand with precision.

TOOL BUYMANSHIP

MILL IT YOUR WAY WITH A THICKENING MACHINE 56

Need some stock milled to exact thickness for your next project? You can do it, plus a whole lot more, with a versatile thickener.

(That's a Foley Belsaw 684 pictured on our cover, and a Shopsmith 555084 shown at right.)



A LITTLE BIT COUNTRY! MALLARD MUG RACK 62

Add an air of country charm to your kitchen with this outdoorsy pine mug rack, or use it as a coatrack in your entry area.



WOODWORKERS' STANDARDS: KITCHEN CABINETS 64

Cabinets come in all sorts of shapes and sizes — and with good reason. Here are the dimensions and tips you need to tailor your cabinetry project to the people who use your kitchen.



A GEM OF A GIFT! 24-KARAT JEWELRY CASE 68

Any woman appreciates having a special place to keep small jewelry items neatly organized — especially when the unit looks as classy as this.



TEA FOR TWO! TINY TABLE AND CHAIRS 74

Build this play set from just one 4x8 sheet of plywood (we used ribbon-stripe mahogany). You're sure to delight someone special, as we did these two proper young ladies.



SHORT-SUBJECT FEATURES

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WOODWORKS

SHAKER PEGS			
MUG PEG		Qty.	Total
3 1/2" Maple Shaker Pegs	\$20.00/100	_____	_____
2 1/2" Medium Shaker Peg	15.00/100	_____	_____
1-3/4" Mini Shaker Pegs	7.00/100	_____	_____
3-3/8" Kitchen Mug Pegs	20.00/100	_____	_____
2-7/16" Tie Rack Pegs	7.00/100	_____	_____
Bean Pot Candle Cup	17.00/100	_____	_____

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Maple Toy Wheels with 1/4 holes						
1 x 3/8 Maple Toy Wheels	\$6.50/100	_____	_____	_____	_____	_____
1-1/4 x 7/16	8.50/100	_____	_____	_____	_____	_____
1-1/2 x 1/2	10.00/100	_____	_____	_____	_____	_____
1-3/4 x 9/16	14.00/100	_____	_____	_____	_____	_____
2 x 5/8	17.50/100	_____	_____	_____	_____	_____
Axle Pegs For Above	4.50/100	_____	_____	_____	_____	_____
TOY PARTS ASSORTMENT						
25 Items - 519 Parts	39.95/Each	_____	_____	_____	_____	_____

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1" Full Round Balls	\$8.00/100	_____	_____	_____	_____	_____
Nutcracker - White Birch	10.00/100	_____	_____	_____	_____	_____
Apples	3.00/Each	_____	_____	_____	_____	_____
Large Egg 1-7/8" x 2-1/2"	1.50/Each	_____	_____	_____	_____	_____
Small Eggs 1-3/8" x 2"	35.00/100	_____	_____	_____	_____	_____
	25.00/100	_____	_____	_____	_____	_____

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1/2" Maple Buttons	\$2.15/100	_____	_____	_____	_____	_____
3/8" x 2" Dowel Pins	2.25/100	_____	_____	_____	_____	_____
1-1/2" Maple Spindles	2.20/100	_____	_____	_____	_____	_____
1-1/2" Oak Spindles	9.00/100	_____	_____	_____	_____	_____
2-1/8" Maple Spindle	12.00/100	_____	_____	_____	_____	_____
2-1/8" Oak Spindle	14.00/100	_____	_____	_____	_____	_____
	18.00/100	_____	_____	_____	_____	_____

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310	Laminate Trimmer	190	124
312	Laminate Trimmer	205	134
330	Block Sander	87.50	54
361	3x24" Blt Sander	260	169
363	4x24" Blt Sander	280	183
690	Router 1 1/2 HP	194	126
9118	Porta Plane Kit	299	199
9381	Hinge Template	199	139

Milwaukee Tools

0222-1	3/8" VSR Drill	146	98
0234-1	1/2" VSR Drill	159	109
0566-1	Drain Cleaner	249	173
1610-1	1/2" Spade Hndl Drill	189	132
1670-1	1/2" Hole Hawg	275	189
3002-1	Rt angl Electricians Drill	253	175
3300-1	Rt ang Magnum Drl	249	169
5399	1/2" Hammer Drill	261	179
5377	7 1/4" worm Drive Saw	259	143
5511	2 Spd Sawzall, case	181	119
8539	Cordless Screwdriver	84	59
8543-1	0-1000 rpm Screwdriver	199	138

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LU85M010	10x80 T Fine Cutoff	110.88	59
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90-100	15pc Router Bit Set	229.00	129
94-100	5pc Router Bit Set	248.00	159

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Makita Tools

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2401BW	10" Miter Saw	329	189
2708	8 1/4" Table Saw	348	199
3601B	Router D Handle	198	118
3612BR	3HP Plunge Router	318	179
4200N	4 3/8" Trim Saw	168	99
5081DW	Cordless Circ. Saw	192	102
5402A	16" Beam Saw	518	299
6012Hdw	3/8" Cordl Scrudrill	188	94
6510Lvr	3/8" VSR Drill	136	76
6800Dbv	0-2500 rpm Screwdr	144	79
6905B	1/2" Impact Wrench	252	135
6906	3/4" Impact Wrench	528	299
9924B	3x24" Belt Sander	208	124
B04510	Block Sander	86	45
JR3000V	Var Spd Recipro Saw	198	114

Black and Decker Tools

1179	3/8" Drill O-1200	122	69
1980	Cordl Dr. w Clutch	184	99
3051	7 1/4" Worm Dr Saw	246	135
3103	2 Spd Cutsaw	191	89
4010-10	Palm Sander	88	46
6513-09	1/2" Elect. Imp. Wr	179	109

Ryobi Tools

TS251U	10" Miter Saw	329	159
W2005	16 1/4" Beam Saw	499	279
RJ100V	Var Spd Recipro Saw	189	99
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TR30	Laminate Trimmer	119	65
AP10	Planer	689	359

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ANY ITEM THIS PAGE

Bosch Power Tools

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1604	Router 1 3/4 H.P.	209	115
1921vsr	Cordless Drill 3/8"	189	99
90-300	3 1/4 HP Router	500	295
1942	Heat Gun	99	59

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35-625	10"x80T TC&F	123.05	76
35-604	9"x84T ATB	88.00	49
35-623	10"x80T ATB	116.00	69
35-677	14"x108T ATB	158.85	89
35-647	12"x72T ATB	145.10	79
35-626	10"x60T ATB	83.65	49
35-560	8" Carb Dado Set	190.00	99

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D13	1/2" Spade Hndl Drill	178	99
DRC10	3/8" Cordl Scrudrill	159	74
F20A	3 1/4" Planer	154	69
TR6	Laminate Trimmer	138	83
TR12	3HP Router	299	163
C7SA	7 1/4" Circular Saw	105	65
W6VA	0-2500 Screwdriver	133	79
KR10V	Var Spd Recipro Saw	179	107

Skill Tools

551	5 1/2" Circular Saw	99	72
77	7 1/4" Worm Dr Saw	240	129
471	1/2" Impact Wrench	disc	139
448	3x24" HD Belt Sndr	disc	259
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2016-2	3/8" cordl vsr Drill	199	95
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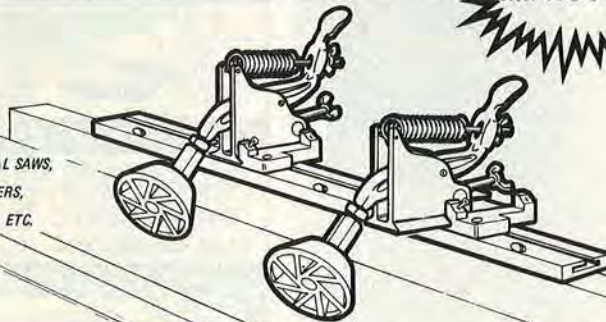
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We welcome comments, criticisms, suggestions ... even an occasional compliment. The volume of mail we receive makes it impossible to answer every letter, but we promise to do our level best. Send your correspondence to: Letters Editor, WOOD Magazine, Locust at 17th, Des Moines, IA 50336.

FINDING THE RIGHT FILLER

(Regarding the article on Flecto's one-day finishing system on pp. 58-59 of the June, 1986 issue): Help! I found the Sherwin Williams Natural Transparent Semi Paste Filler, but only in one-gallon containers. I'm also having trouble locating Varathane in my area.

— Carl J. Ellis, Sr., Chester, Pa.

As we pointed out in the article, we tried three different fillers before coming across one that would accept Varathane properly. If you don't want to invest in a gallon of the Sherwin Williams product (it doesn't come in smaller sizes), we advise you to conduct your own shop test to be absolutely sure.

Visit your paint dealer — and if he's a friend — ask for a small sample of their paste wood filler, or buy a small can. Thin the heavy paste down to a creamy consistency using paint thinner or a mixture of thinner and stain if you prefer. Wipe it on, let it stand at least 30 seconds or until it loses its gloss, and wipe it off. Then, let it dry for about 24 hours, and apply the Varathane to your sample. If you don't notice any flaking or peeling, you're home safe.

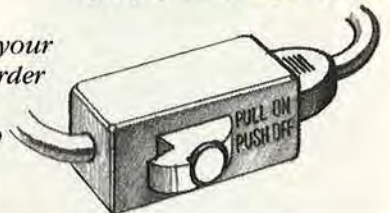
As for finding a Flecto dealer in your area, write or call: Kath Holcombe, Consumer Affairs, Flecto, 1000 45th St., Oakland, CA 94608 (phone 800/227-2944).

SAFETY-SWITCH SOURCE

In your February, 1986 issue, a "Shop Tip" on p. 18 shows a knee-level on/off switch for table-saw safety. Please tell me the name of the switch and where I can purchase it.

— Joseph J. Wick, Elm Grove, Wis.

Joseph, you can call your local Sears store to order their pull on/push off power-tool switch (stock no. 9GT13632, \$24.99).



IN CASE OF FIRE ... PLAN AHEAD!

I read your magazine with enthusiasm and have learned a lot. I hope my experience will help others.

I had a fire in my shop that wiped out about 85 percent of my power machines, tools, lumber, etc. Fortunately, I had insurance, but the insurance company wanted a complete list of everything I had in my shop. They required the names of machines and tools,



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the purchase dates, amount of purchases, and manufacturers. I had none of the above information, which made it difficult to secure adequate and just compensation. Please advise your readers to make a list. (P.S. Don't store the list in your shop, as it may burn up, too!)

— Stewart L. Moyer, Reading, Pa.

Thanks for some solid advice, Stewart. You may have just saved some woodworker thousands of dollars!

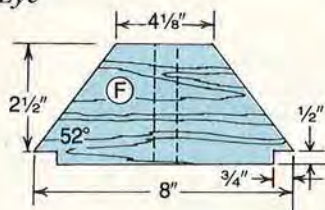
NOW WE SEE THE LIGHT!

(Regarding the redwood lantern project on pp. 58-60 of the April, 1986 issue): I cut my wood according to the bill of materials on p. 61. When I tried to assemble the lantern, I found part F was impossible to make with the dimensions given.

— David Davis, Portage Basques, Newfoundland, Canada

This month, our "Eagle-Eye Reader Award" travels north of the border to our friend David. The drawing to the right lists the correct dimensions for part F.

Good catch, David!



COVERING SHARPENING SAFETY

WOOD heard from a number of readers who apparently learned a lot from our article on "Hollow-Grind Sharpening" (June, 1986, p. 67). However, several readers raised some safety concerns.

Our cover photograph was a time exposure — the technique that best captured the effect of the sparks. We did not intend to imply that you should sharpen tools one-handed or that you should apply as much pressure as we did to create our sparks. We also advised several times to quench the tool often to prevent excess heat, which can affect Rockwell hardness.

WANTED: MORE BAND-SAW PROJECTS

I could use some help and suggestions about a new tool of mine — the band saw. How do you make those band-saw boxes that you see so often? Could you suggest some other projects using the band saw?

— S. Levine, West Orange, N.J.

We've heard from a number of readers interested in band-saw boxes. First, let us refer you to two articles that appeared in our August, 1985 issue: "Band-Saw Boxes" featuring noted craftsman Richard Rothbard (pp. 26-29); and "Clone Boxes," a project plan (pp. 44-45). Also, stay tuned to WOOD — hope to discuss band-saw techniques in an early 1987 issue.



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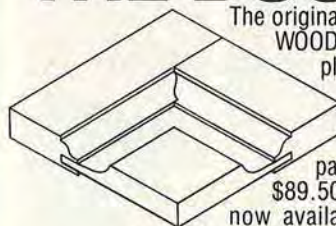
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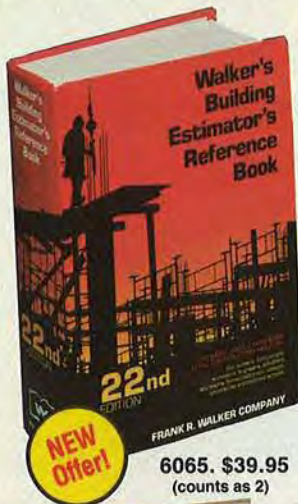


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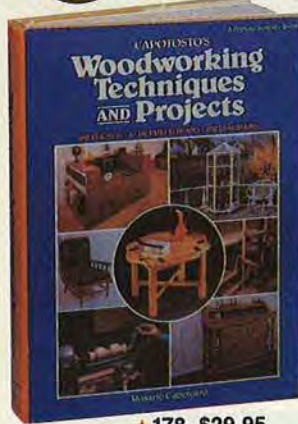
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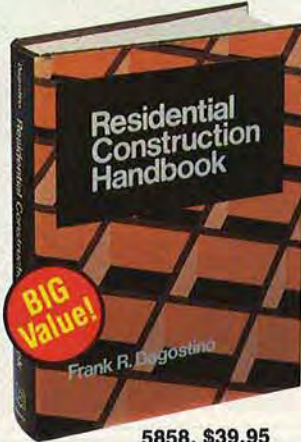
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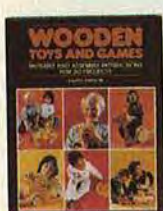
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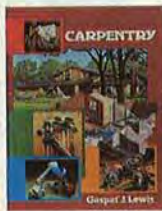
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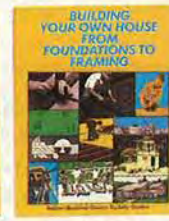
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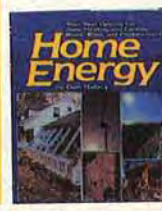
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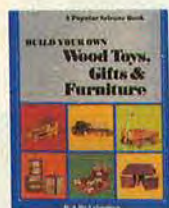
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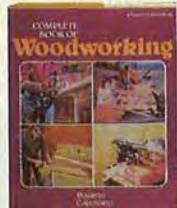
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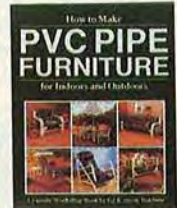
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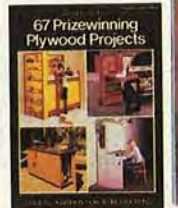
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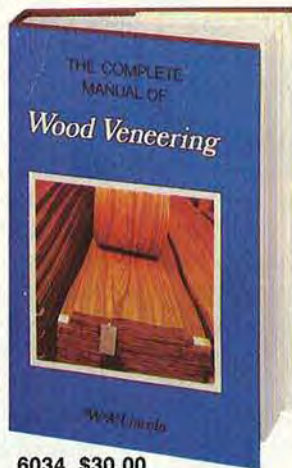
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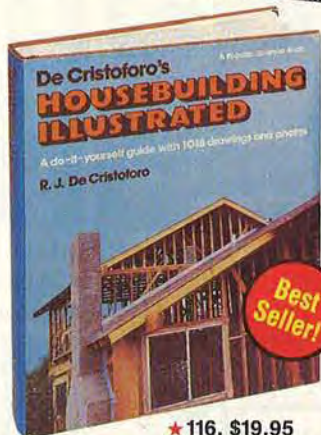


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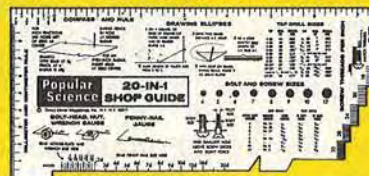
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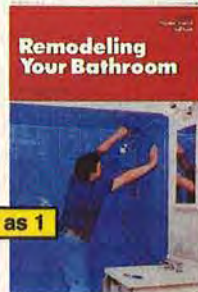
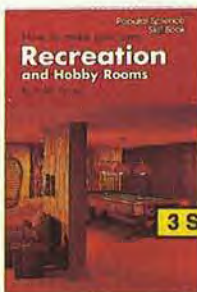
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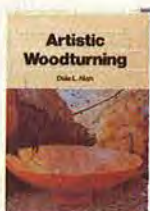


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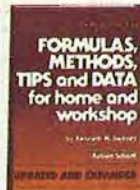
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In woodworking, as in life, no one knows it all. But through experience, we all discover — or stumble onto — better, safer, faster, or easier ways to do things. When we devise interesting tips or techniques, we'll share them with you in this column. And when you send us your favorites, we'll pay you \$25 for each submission we publish. No shop tips can be returned. Mail your tips to:

Shop Tips

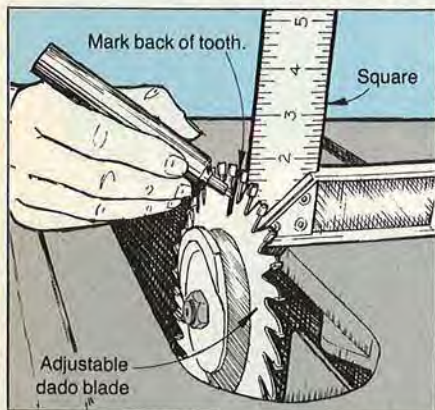
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Try this speedy dado-blade setup

Adjustable dados with carbide tips, sometimes called wobble dados, can save you a lot of time in the workshop. The problem is that it's really hard to tell which tooth cuts the farthest to the left and which does the same to the right when you're setting up the cuts.

TIP: Next time, try this solution. Set the dado at its widest setting and align a square against the blade as shown in the drawing, below. Move the square away from the blade until just one carbide tip touches the square. Mark the back side of that tip with paint or a permanent marker. Do the same for the left side of the dado blade and mark it with a different color of permanent marker or paint. Presto! You can quickly spot the two outside teeth that determine the width of the cut.

— Wilbur Bray, Logan, Ohio

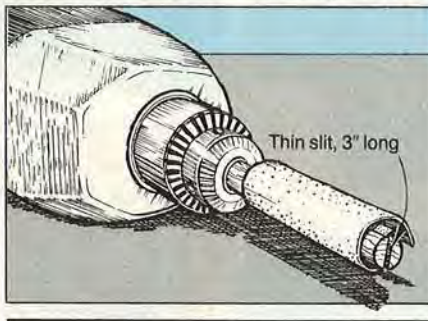


Here's an inexpensive sanding sleeve

It's frustrating to sand the inside of any hole smaller than a drum sander.

TIP: Dowels 3/8" or smaller are ideal for sanding difficult surfaces. With a thin-blade saw, slit 2" or 3" into one end of a 5" or 6" dowel. Insert a strip of sandpaper through the slit and wrap the sandpaper tightly counterclockwise around the dowel. Chuck the other end of the dowel and sand.

— Carl Dorsch, Oakdale, Pa.



Putting the squeeze on tung oil

There's nothing more exasperating than discovering that the tung oil you've carefully saved has solidified in a partially filled container.

TIP: Recycled shampoo bottles with a flip-up spout are excellent for storing tung oil and other finishes. Thoroughly rinse and dry shampoo bottles before filling them with finish. Squeeze excess air from the bottle and flip the spout closed. Be sure to label the contents of the bottle with an indelible marker for future reference.

— Ross G. Roepke, Tullahoma, Tenn.

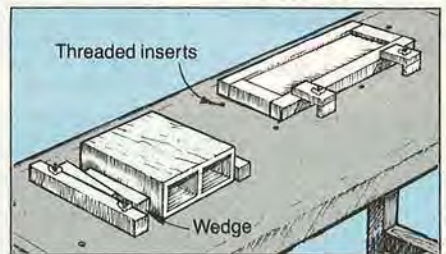


Substitute bench dog

Bench dogs can be a woodworker's best friend, but not all workshop tables were created equal. How can you make your own?

TIP: There's an inexpensive way to build effective hold-down clamps for practically any workbench. Parallel rows of threaded rosan inserts (try 5/16" #18) placed across your table form this arrangement. As shown in the foreground of the drawing, two strips of wood, two wedges, and four threaded rods and wing nuts complete the clamp. In the background, note how to clamp odd-shaped pieces using a block of wood under secured wood strips.

— John Wolf, St. Joseph, Mich.

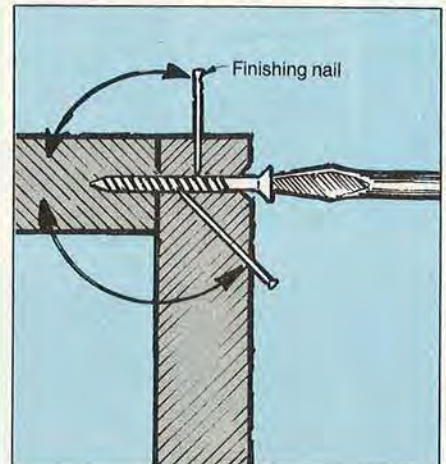


Stripped, but not forgotten

When a wood screw is stripped of its holding power, it seems nothing can back it out of its hole.

TIP: Driving small finish nails from different angles into the screw, as shown in the drawing, is the first step to defeating the troublemaker. The nails provide you with enough bite to back the screw out, and you can grab the head with your fingers or pliers.

— Edwin M. Dery, Monticello, Fla.



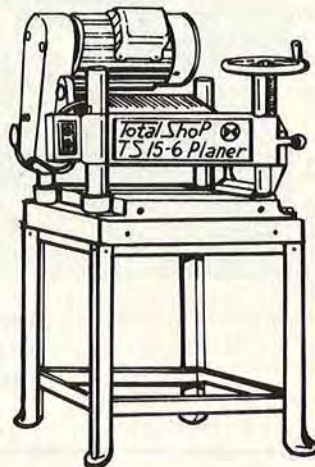
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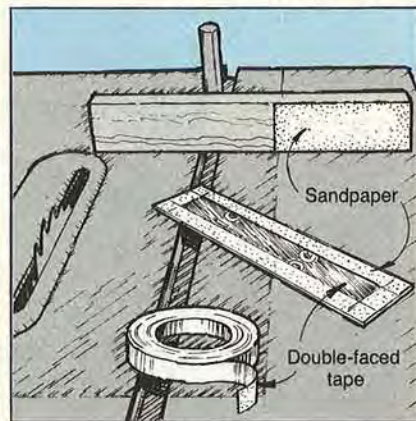
Continued from page 12

Miter nice

The slick metal surface of a miter gauge often is the culprit when wood slides into the table-saw blade.

TIP: To prevent wood from sliding, use double-faced tape to affix medium- or fine-grit sandpaper to the face of the miter gauge of any power tool. You can easily replace the tape and sandpaper when necessary.

— Bill Roberts, Angola, Ind.

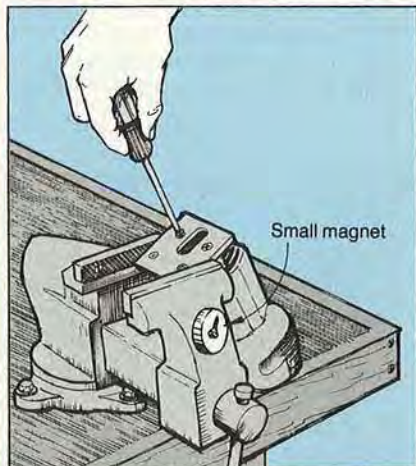


Vise magnetism

Screws, bolts, and other small parts just sort of seem to wander away when you work around a vise.

TIP: Epoxy a small magnet to the side of your vise to keep closer tabs on your footloose hardware. This handy addition to your workshop will save a lot of time looking for metal parts that disappear all too quickly.

— Randy Marras, Chicago, Ill.



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Swab idea

You can pull on your ear for a long time before figuring out how to flood stain, varnish, or paint into holes and crevices missed with a brush.

TIP: Cotton swabs are ideal for getting finish or glue into tight areas. The cotton holds an amazing amount of liquid to make fast work of small jobs. And better yet, swabs are inexpensive and disposable!

— Fred Shetzel, Elizabethtown, Ky.



An idea fresh from the oven
Accumulated pitch and gum on saw blades and router bits speeds the dulling process.

TIP: Oven cleaner is an effective, safe, and inexpensive pitch and tar remover. In addition, oven cleaner is less volatile than lighter fluids used for the same purpose by some woodworkers.

— Mike Innis, Atlanta, Ga.



Continued

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1335-096

Continued from page 15

Sandpaper saver

Sandpaper and patience quickly wear out when you smooth chair rungs, spindles, and other curved surfaces.

TIP: Extend the life of your sandpaper by fortifying the sandpaper with duct or masking tape as a backing. You may need to use some tin snips or heavy shears to cut the reinforced sandpaper.

— Dr. Donald A. Keiser, Saginaw, Mich.

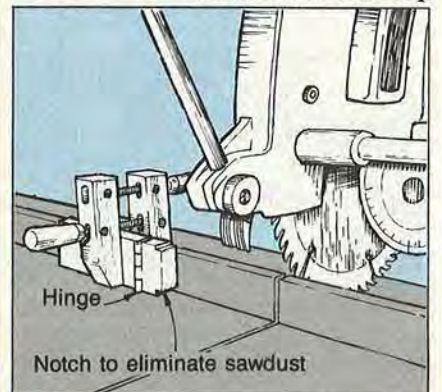


Rolls-Royce stop block

Stop blocks come in real handy when you want to cut several pieces to the same length. But you usually have to move the block to ensure that both ends are squared.

TIP: With the gate closed, position and clamp the block to the fence so that it's the exact finished length of the pieces away from the blade. Open the gate, position the workpiece, and cut. Then close the gate, flip the workpiece end for end, and make a final cut. The movable, hinged end gate of this stop block works on either side of a radial-arm or table-saw blade.

— From the WOOD Shop



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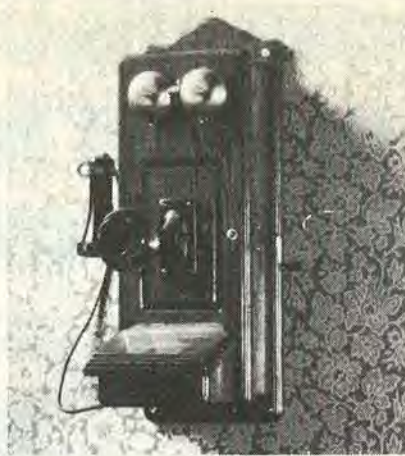
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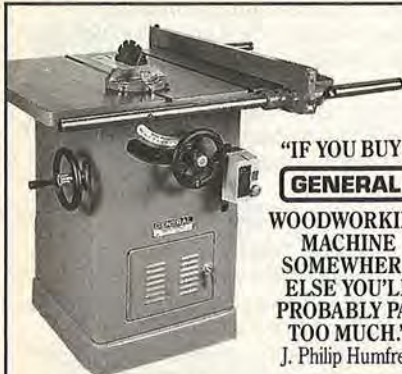
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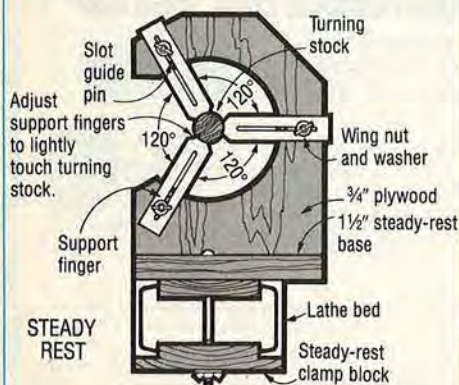
SPINDLE-SNAPPING CURE

Q. *The oak chairs I'm restoring have small-diameter (about 1/4") spindles in the backs that need to be replaced. I've tried turning new ones, but they always break. What am I doing wrong?*

— Bruce R. Chadima, Cedar Rapids, Ia.

A. Here's a checklist to follow when you tackle fine turnings, Bruce:

- Set your lathe speed to about 1,000 rpm.
- Use the shearing (cutting) method of turning.
- Use a light, but firm, touch on the workpiece.
- Don't put excessive pressure on the workpiece with the tailstock.
- Mount a steady rest to the ways of your lathe bed, centered between the headstock and the tailstock. This will reduce the "whipping" effect you get when applying pressure to a long workpiece. You can buy one, or make one like that shown in the drawing below.



HELP TOOLS KEEP COOL

Q. *The cooling slots on my power tools are like sawdust magnets. I've tried unsuccessfully to blow out the dust, and the only solution seems to be disassembling the tools to clean them. Have you got a better idea?*

— T. S. Dickelman, Indianapolis, Ind.

A. Obviously you've found that it takes more wind to clean out your tools than to blow out the candles on your birthday cake. If you don't have an air compressor, stop by your local photography store for a can of compressed air designed to clean camera lenses. The small tube that comes with the can is just the ticket for tight spots.

HOW TO MASTER PATTERNS

Q. *What is the most effective method of transferring carving patterns to wood? I'm having two problems with my carbon paper patterns: missing lines and patterns that wear out quickly.*

— Edwin Barsness, Black Earth, Wis.

A. Instead of tracing carbon paper patterns onto your workpiece, trace them onto cardboard. (Try shirt boards from the laundry or backing boards from writing tablets. Any solid — not corrugated — cardboard should work.) Use a razor knife to cut out your patterns, and you'll end up with templates that you can trace for many projects.

VENEER PROBLEMS ARE ONLY SKIN DEEP

Q. *I have an old sewing machine cabinet covered with veneer that's missing in some sections and pulling up in others. How can I get the old veneer off without hurting the wood underneath?*

— Tim Froelich, Bismarck, N.D.

A. Start off by working an edge loose with a thin-blade putty knife or a drywall-taping knife. Then

squirt vinegar under the veneer to help release the old glue (that's if it's hide glue, which sounds likely in the case of an old sewing-machine cabinet). Give the vinegar a few minutes to do its thing. Once you get started, the veneer should pop off in large sections. Take care not to gouge the surface.

By the way, we hope you're not planning to refinish the wood under the veneer. More than likely, it's "filler" wood intended for use only under a layer of veneer. Plan on reveneering the surface, then finishing it.

MATCH YOUR ROUTER TO THE JOB

Q. *Many carbide router bits I'm interested in trying have 1/2" shafts, but the collet on my router will only accept 1/4" shafts. What can I do?*

— Leonard Beller, Plainville, Mass.

A. Sorry, but unless your router is designed for use with interchangeable collets, you'll have to buy a new router. We know of no universal adapter to convert a 1/4" collet to a 1/2" rig. Even if such a device were available, we'd question using it, because your 1/4" router's motor and bearings wouldn't be able to handle the greater loads caused by 1/2" bits.

IS A COMBINATION TOOL FOR YOU?

Q. *I want to buy power tools, and I'm wondering whether to buy a combination power tool or individual power tools.*

— Richard J. Baker, Fairfield, Calif.

A. As with many other decisions, part of the answer depends on your bank account. Concentrate on the best tools you can afford for the jobs you have in mind, but don't pay for capabilities you won't utilize. For example, if you really only need a table saw and a drill press, buy them only. But if you also need a lathe, sander, or a planer, opt for a combination machine. 🌲

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- #10 screws 1", 1 1/4", 1 1/2", 2" long
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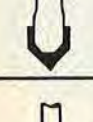
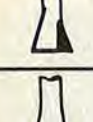




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YESTERDAY'S TOOLS

Beginning in this issue, WOOD brings you a look at some notable tools from the past. Each has a story to tell — where it originated, how it was made, what it was used for, and, if you're interested in collecting, notes on value.

THE HEWING AX

Frontier lumber maker



Top. Standard goosewing ax with elongated eye, slight poll, and sound old handle; thought to be German, c. 1800. *Middle.* Exceptional Austrian goosewing with 20 1/2° bit and decoration, c. 1700. *Bottom.* Typical American "broad ax" with bent handle, c. 1840.

Before the days of sawmills, table saws, and planers, you chopped away with a hewing ax if you wanted flat sides on round wood. In the hands of the skilled craftsman, this nearly indispensable tool hewed beams for homes and barns, and even fashioned rustic furniture. Some hewing axes nearly became works of art. Others remained quite plain, particularly those made on the American frontier.

What makes a hewing ax different?

The sharpened cutting edge of an ax is called a bit. Unlike a felling ax, which has a bit sharpened from both sides of its head to form a fine edge (like a knife), the bit of a hewing ax is sharpened from one side only. Therefore, a hewing ax works as a chisel does: The flat side slides against the wood while the sharpened edge of the other side slices.

Hewing axes also have longer bits than felling axes, and they're slightly curved along their length. American versions range from 9" to about 14" in length, and European ones often exceed 16", their shape suggesting a goose's wing.

But don't rely solely on the shape and bit length of a hewing ax to tell you where it came from. All axes made before the early 1800s were handcrafted by blacksmiths who followed individual as well as regional preferences as to shape.

Continued on page 24

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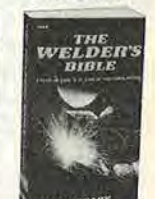
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YESTERDAY'S TOOLS

Continued from page 22

How you can tell an ax's approximate age

Accurate dating of any old tool adds collectible interest and value, but hewing axes can pose special problems. The many makers, the variety of shapes, and the tendency for a favorite shape to be repeated without change for hundreds of years (no matter where the shape originated), make it hard to date an ax.

Knowing collectors use these guidelines for general dating:

- Axes from the 17th century and earlier don't have a *poll*, which is the flat, thick area of the head opposite the bit end.
- A round or elongated *eye* in the ax head, which accepts the handle, means the tool belongs to the 18th century. Axes made after that were beefed up with long, narrow eyes similar to today's axes.
- An all-wrought-iron ax head indicates it was made before 1800. Find one with a stronger, steel bit forged to softer metal and it was probably made after 1800. Note, though, that it was common practice during the 19th century to forge harder steel bits on old axes.

What it might be worth

General condition, as well as age, determine the value of a hewing ax. A very old ax that can still be used is worth more than a newer, more fragile one. Generally, hewing axes fall in these value ranges: American hewing axes with bits 10-13", \$30 to \$95; with bits 14" or longer, \$75 to \$200; European goosewing axes, \$100 to \$1,800.

You can count on higher value if a hewing ax has one or all of the following: an original, or at least old, handle with signs of wear and patina of age; a long bit; a handstruck, legible maker's mark (on the right side of the ax head); and incised decoration.

Photograph: Jim Elder

Written with Vernon U. Ward, tool collector and dealer, editor and publisher of *The Fine Tool Journal*.

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PRODUCTS THAT PERFORM

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Cutting clean, the Japanese way

This Japanese saw has an extremely thin (and flexible) blade — just the ticket for flush-cutting fastening pegs and other parts. Since the teeth have no set, this saw won't damage the surface surrounding the joint. (Remember, Japanese saws cut only on the pull stroke.) This tool makes a good choice for cutting joints, too. *Flush-Cutting Saw* (catalog no. 49I07.02), \$67. We ordered ours from *Garrett Wade Company, Inc., 161 Avenue of the Americas, Dept. W, New York, NY 10013.*



Here's how to get to the finish line — fast

If you're like us, there are lots of times when you just can't wait to see a project completed. This spray-on, clear wood finish helps you do just that because it dries dust-free in only 30 minutes. As a bonus, the lacquer finish is water- and alcohol-resistant and won't darken with age. *Deft Semi-Gloss Clear Wood Finish*, \$4.99 in paint outlets, hardware stores, and home centers across the country.



The tie that binds and binds

It's tough to judge the right tension to use with regular clamps or straps when you're gluing joints, repairing furniture, or trying to assemble odd-shaped pieces. The solution: This 20-foot plastic tape lets you feel how much pressure you're applying as you wrap and stretch it around the workpiece. Most glues won't stick to the elastic tape, and it contracts back to original size when you're through. *Snug*, \$3.98 from the *Carrollton Corp., 70 Carrollton Ave., Dept. W, Elmira, NY 14905.*

Continued



A special kind of cutoff saw from Delta

It's not exactly a miter saw, nor is it a radial arm. The Delta Sawbuck has features you won't find in any other machine. Plus, it's stout enough to take the abuse of framing and siding jobs while it remains accurate enough for detailed trimming and cabinet work.

If you already own a table saw for ripping and grooving, and have considered a radial arm, give the Sawbuck a try first. It handles

simple or compound miters, left or right, of up to 45° through full 12" boards (no radial-arm saw, including 12" models, can match that).

The Sawbuck also incorporates a large work table and a powerful 15-amp motor in its design. The whole unit folds up on its own built-in wheels for convenient storage or transport.

It's important that you remember, though, that this saw, like its cousin the power miter saw, is a cutoff saw only. You cannot raise the motor carriage in order to cut dados. And you must slide all material into the saw from the ends. Also, the two end supports for the motor carriage tracks can be somewhat unwieldy at times.

Delta Sawbuck, \$707 suggested retail, Delta International Machinery Corp., 246 Alpha Dr., Pittsburgh, PA 15238.



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WOODWORKER II (For the Table Saw) My new **ALL PURPOSE** blade—*primarily* for your table-saw 1/8" kerf, 30 to 40 teeth (see below). Modified alternate-bevel with micro-finish grind. Exclusive Forrest 400 carbide. Designed for super-fast and super-smooth **CROSSCUTTING** and **RIPPING** in heavy, solid stock with a **smooth-as-sanded surface**. We rip 2" Red Oak with 1 HP at the shows leaving surface smoother than a jointer, then crosscut and speed-miter soft and hardwoods and PLY-VENEERS with NO BOTTOM SPLINTERING. Generally I recommend 40 teeth. However, if your ripping includes a lot of heavy 1 1/2" to 2" hardwoods, specify 30 teeth. See dampener information. **STOP CHANGING BLADES!** (wastes 3-5 minutes). Just raise for thick woods, lower for thin woods and perfect cut everything.

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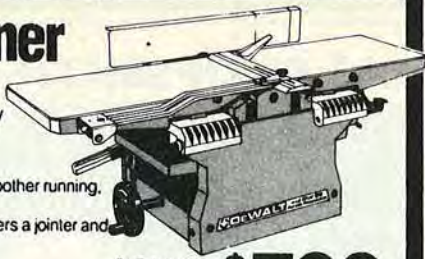
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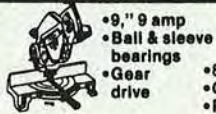
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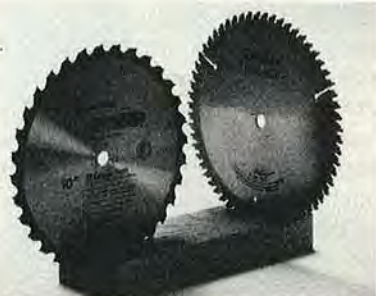
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PRODUCTS THAT PERFORM



Two blades on the cutting edge

Both of these blades — one primarily for table saws and the other targeted for radial-arm use — prove that you *can* teach an old blade new tricks.

● The Piranha blade, shown at left in photo, ripped wood with ease on our table saw. (We tried the blade on oak and rosewood and couldn't get the saw to bog down at all.) The secret is in the computer-aided design, curved carbide teeth, and an advanced

grinding process. Besides wood, this blade can handle plywood, particleboard, hardboard, wall-board, and a variety of plastics. The blade comes in seven popular sizes, ranging from 16 to 40 carbide teeth.

Black & Decker Piranha Blades, from \$8-\$20. Available at hardware stores and home centers.

● We found that the "Radi-All" blade, at right in photo, crosscut admirably when we tried it on our radial-arm saw. The special hook design and precision tooth grind combine for comfortable feed flow and minimal overfeeding (the saw wanting to feed faster than the blade can cut). This 10"-diameter blade has 60 carbide-tipped teeth and a 5/8" bore.

DML, Inc. Radi-All Saw Blade, \$92. Available in saw shops and industrial/contractor supply outlets nationwide.



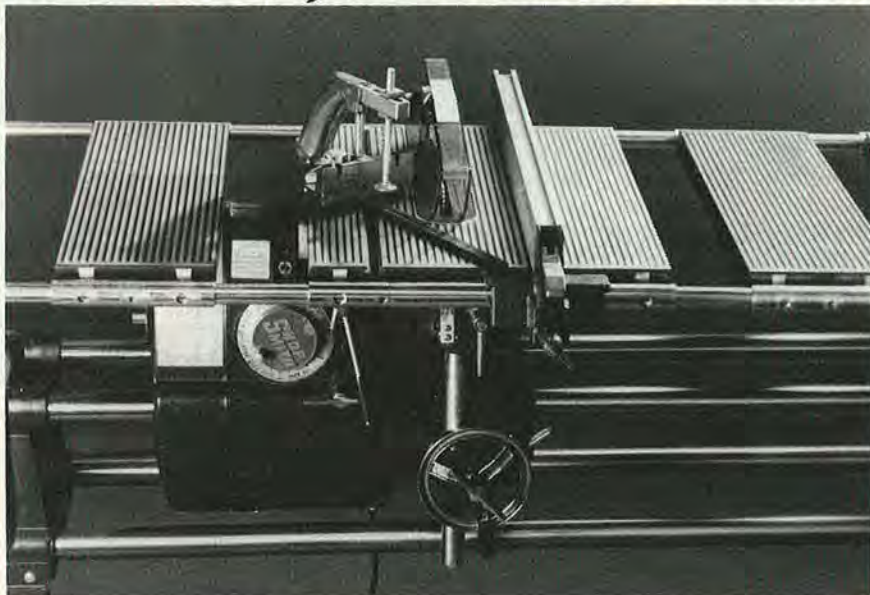
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You'd normally find a combination square of this quality in a machinist's shop, but we think it also belongs in a woodworker's shop. The precision rig's protractor head is calibrated from 0-180°, while the square head has 45° and 90° angles. The 12" steel rule is marked to 1/64" increments. *Combination Square (catalog no. 9-12-4R), \$72 from your local hardware dealer, or write: the L.S. Starrett Company, 121 Crescent St., Dept. W, Athol, MA 01331.*

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If you're on the Shopsmith mailing list, chances are good that you've received literature about the Mark V Retro-fit Kit.

Are you going to like the new system? You bet! Right away you'll notice that the new 17½ x 22" table dwarfs the existing one — it's a third larger. This is a long-awaited improvement for crosscutting wide pieces and ripping random widths of material. Shopsmith also enlarged the fixed extension tabletop. And the double-lock rip fence is another significant improvement; when teamed with the double-trunnion table locks, the package offers greater sawing accuracy. To keep safety at the forefront and fingers attached to the hand, the table insert is painted red.

There's more. The miter gauge has a new "T" bar and a slick quick-clamp assembly. The retrofit upper saw guard moves with the quill, and the new lower saw guard is adjustable (use it as a dust chute with the sanding disk).

For an extra \$100, you can buy two additional floating tables, four extension tubes, and two telescoping legs that take the drudgery out of supporting 4x8 panels — the instruction sheet suggests no fewer than eight arrangements of this package. The nifty system of tubes

locks onto the work table through the rip fence rails. Rolling the Shopsmith with the telescoping legs in place is a slight hindrance, but the legs aren't an accessory you use every day. And they are oh-so handy when needed.

Optional accessories add more flexibility

Shopsmith redesigned several accessories as options for the retrofit. A new saw arbor, sanding-disk hub, and two-position lathe-tool rest arm are included in the retrofit kit. Not included in the kit: five special-purpose table inserts, a shaper/drum sander fence, and a mortise hold-down.

The retrofit system represents five years of development and testing, according to Shopsmith test engineer Jim McCann. He rates this package as the biggest news in mutli-purpose tools since Hans Goldschmidt introduced his space-saving power tool in 1946. It's hard to fault McCann's assessment.

Mark V Table System Retro-fit Kit #555135, \$339; with extension table kit, #555142, \$450. Prices do not include local taxes or freight. Available from Shopsmith Inc., 6640 Poe Avenue, Dayton, OH 45414-2591, or call 800/543-7586 (in Ohio call 800/762-7555).

The saga of **OSAGE ORANGE**



Thick and thorny, Osage orange served as fencing. For the Indians, it made prime bow wood.

Before the age of barbed wire, settlers in what is now Arkansas, Oklahoma, and Texas discovered they could *plant* fences rather than build them of rock or rails. To keep livestock in or out, they propagated hedgerows of a thorny, thick-growing native tree. The stands produced an ugly, inedible, orangelike fruit.

After a few seasons, this living fence became impenetrable, and as it matured, it formed a dense windbreak 20' or more high. As word spread, landowners from the heartland to the Atlantic Coast sought the seed to plant.

The tree was called "bodark," the settlers' pronunciation of the French *bois d'arc*, meaning "wood of the bow." For this species had first furnished the Osage Indians with wood for their bows, famed far and wide among tribes as the trustiest. Today, we know this tree as Osage orange, and you still can find

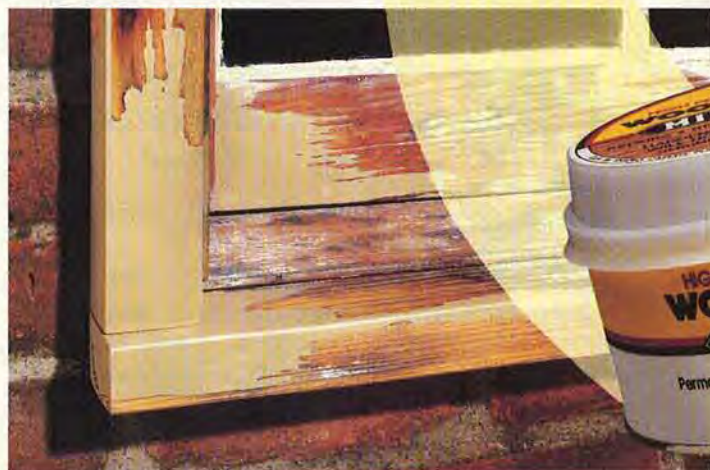
surviving thickets along hedgerows from Nebraska to Massachusetts and from Wisconsin to the delta country of Mississippi.

Luckily, Osage orange adapted to a variety of climates and soil conditions, for in its original range the tree nearly met with extinction. Settlers exploited Osage orange's bright yellow, hard, resilient, and decay-resistant wood for wagon-wheel hubs and rims, pulleys, tool handles, and even fabric dye. Later, mature thickets were almost depleted to meet additional demand for fenceposts on which to string barbed wire, and ties for the rails of the nation's trains.

If you're lucky enough to find some Osage orange, ask permission to harvest a stout piece. Then, turn a bowl or make a cutting board out of it. You'll enjoy the color, and it will withstand abuse. 🌳

Photograph: Jim Kascoutas
Illustration: Jim Stevenson

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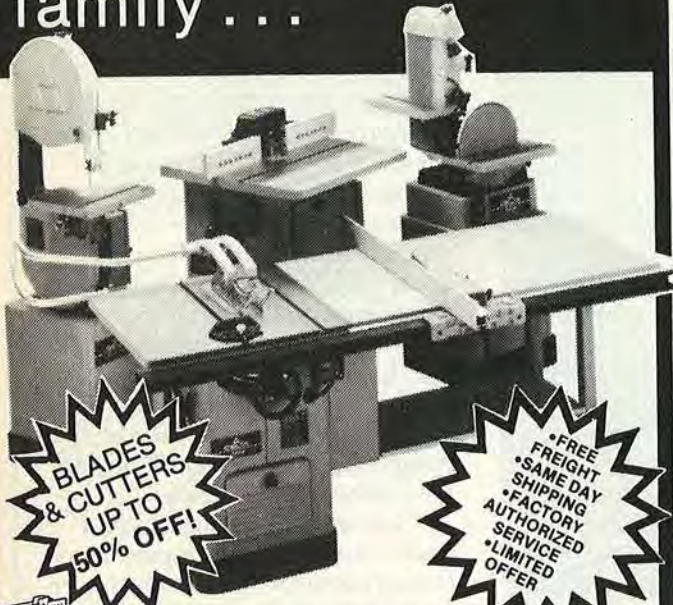
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EASTERN RED CEDAR

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French Acadians, deported from Nova Scotia by the British in 1755 to what is now Louisiana, found a familiar softwood growing in their new land. For its red bark and red wood, they called it *baton rouge*, meaning “red stick,” the name the French settlers adopted for their capital city.

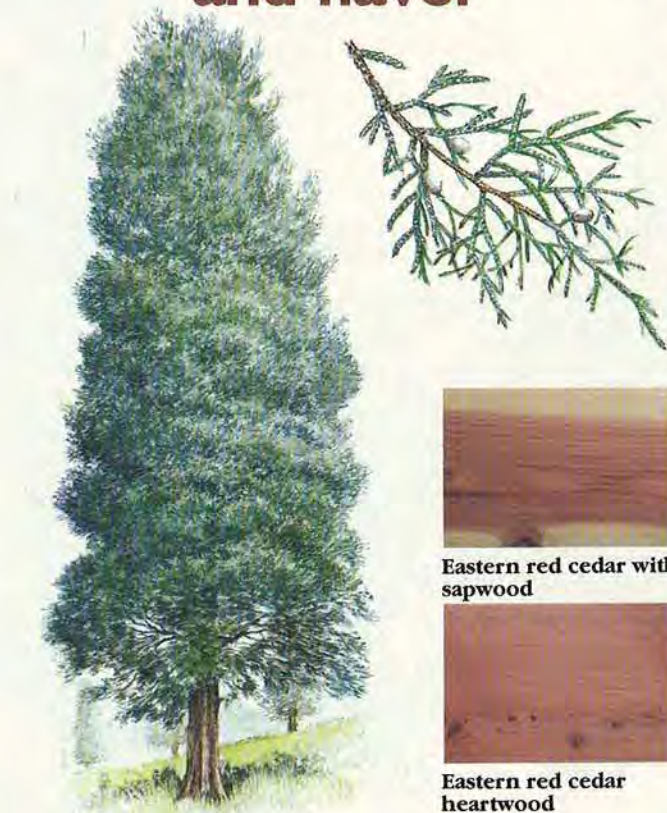
Eastern red cedar, the “red stick” of the Acadians, belongs to the juniper family of conifers, one of the oldest on earth. Ancient Egyptians used a juniper to make chariot wheels in 1300 B.C. And the Dutch, who first distilled gin in the 17th century, flavored their concoction with juniper berries, a practice that continues today.

Juniper leaves and twigs also furnish a fragrant oil for medicines and perfume. But moths and buffalo beetles find juniper’s sweet smell highly repugnant. That’s why eastern red cedar, made into chests and closet linings, has been prized for protecting woollens since colonial times.

When large stands of large trees were abundant, eastern red cedar was used for lead pencils because it shaves so nicely. Now, an African cedar has replaced it as pencil wood, and woodworkers make use of knot-free, narrower boards.

Wood identification

Sometimes called red juniper and aromatic red cedar, eastern red cedar (*Juniperus virginiana*)



Eastern red cedar with sapwood

Eastern red cedar heartwood

grows from north to south in most of the eastern U.S. and even west into North Dakota and Texas. For soil, it likes every variety except wet, spongy swampland.

Eastern red cedar averages about 16” in diameter and 20’ to 50’ tall. Rather than the needles typical of evergreens, this tree has lacelike fronds that brown with age. Its bark appears reddish-brown and shredded, and easily strips from the trunk. By autumn, eastern red cedar trees develop pale,

blue-green berries, much appreciated by birds.

The wood of eastern red cedar is light, weighing about 33 lbs. per cubic foot air-dried, and, surprisingly, is 80 percent as strong as white oak. The thin, white sapwood has a pale pink hue, while the heartwood darkens to pinkish red. The oil in the wood causes its pleasant, unmistakable aroma — especially around the knots.

Working properties

Eastern red cedar has a fine grain, but a soft tex-

ture. It works easily with hand or power tools, despite the fact that it is somewhat brittle. In stability, it ranks quite high.

If you want the wood to remain fragrant, don’t cover it with a finish. Otherwise, use anything but polyurethane or plastic finishes — oil in the wood makes it difficult for them to adhere.

Note: Unfinished eastern red cedar eventually becomes less fragrant as its oil hardens in the wood surface. You can renew the fragrance by sanding with fine-grit sandpaper. Fresh oil from the inner wood will rise to the surface, renewing the aroma.

Uses in woodworking

Eastern red cedar works well for trim in boats and canoes, as cedar chests, for closet linings, jewelry boxes, bookcases, carvings, and turnings.

Cost and availability

Although it’s a softwood, hardwood grading standards apply because eastern red cedar is used primarily as a cabinet wood. Since clear wood is hard to come by, most eastern red cedar boards carry the “common” grading label, and a fairly inexpensive price of about \$1.50 per board foot. Readily available boards rarely exceed 7” widths, 6’ lengths, and 1” thicknesses. Veneers, plywood, and particleboard are other products. 🌲

Illustrations: Steve Schindler
Photographs: Hopkins Associates

A PENCHANT FOR



Warm wood tones and a radiating fireplace create the perfect setting for period furniture. Here, Ken and Louise share a cup of evening tea, served from the walnut Chippendale tea table that he built.

PERIOD PIECES



Chemistry Professor Ken Williamson challenges his skills with exacting reproductions of classic furniture



That's Ken Williamson, 51, pausing outside his center-chimney, 14-room colonial house. Colonial carpenters hung the door behind him in 1740. But Ken himself added the surrounding pediment.

Inside, you'll see the classic Queen Anne, Chippendale, and Federal-era reproduction furniture he's made. It would take an expert to tell them from the antiques he and his wife, Louise, have collected.

Yet, the 20th century has indeed made its mark in the Williamson's South Hadley, Mass. home. You'll often find Ken, who teaches organic chemistry at Mount Holyoke College, at his personal computer. But most evenings, you'll find him down in the shop, going from modern power tools to antique hand ones while building the period furniture he crafts in faithful detail. "Ken's classroom teaching doesn't show immediate results," says Louise, "but with wood, Ken sees them instantly."

Winston Churchill once said: "Our houses shape us and we shape our houses." Ken Williamson loves that quote — indeed, he's lived it.

When Ken and his wife owned a ranch-style home, Ken was making Danish modern furniture. When they bought their colonial home 15 years ago, it coincided with Ken's yearning for more of a woodworking challenge. He found it in Queen Anne, Chippendale, and Federal styles that not only were more compatible with their newly purchased home, but ones which would raise his work to a new level of excellence.

Says Ken: "Many of the classic designs have been worked out over centuries. You can't play around with them. The creativity, and the challenge, come in the decoration, not the proportions."

In the Williamson home, Ken's work looks comfortable with the antiques. And now, in the words of a colleague, Ken's good enough "to have been a foreman in the Chippendale shop."

GETTING STARTED IN PERIOD FURNITURE

You'd never suspect Ken has had little formal woodworking training. His father and grandfather both worked with wood a little, and Ken took shop in high school. Otherwise, he's self-taught.

When Ken decided to tackle reproductions, he headed for the library to research the subject. "At a library, you can pick your own starting level with a book that means something to you," he advises. (See Ken's reading suggestions at the end of this article.)

Reproduction furniture kits represent another way to get started, according to Ken. "For someone who hasn't done something like that before, putting a kit together is a good lesson," he says.

MEASURED DRAWINGS: CLASSICAL DESIGNS ON PAPER

Ken's career in organic chemistry may seem a world apart from woodworking, but Ken cites a similarity. "My chemistry research involves viewing molecules in three dimensions and working out ways to visualize them in two dimensions," he explains. "If you're designing a piece of furniture, you'd better learn to do the same thing on a piece of paper."

Down in his cramped workshop — situated in the only part of the centuries-old basement where you don't have to duck your head — Ken has a pile of drawings for work in progress. Furniture makers call them *measured drawings*, and, for reproductions, they're critical. Unlike shop sketches or plans, highly detailed measured drawings provide only minimum measurements for major features and subparts as guidance to the original proportions. The craftsman has to dimension parts and figure out construction.

At first, Ken copied drawings and dimensions for his projects from reference books. Now, he knows enough about period furniture to scale his drawings from museum photographs.

Ken holds up some full-sized templates for the cabriole legs of a new Chippendale piece as an example of why drawings are so important. He comments: "One of the subtlest things you can do in woodworking is make a cabriole leg. If it differs as much as $\frac{1}{16}$ " in some dimension, it's not going to look right."

Ken found out that one of the challenges in making period pieces lies in exactly duplicating the work of early masters, not in boundless creativity. "Creativity has to be channeled," Ken notes, "into such directions as how much elaboration



A PENCHANT FOR PERIOD PIECES

you put into the piecrust (the ornately carved rim) on the top of a candle table. The carving on the knee of the legs (shown, *right*) is about the only place to really express yourself. Even if you try to duplicate someone else's carving, your own expression comes through. It's like handwriting — I can always recognize my own work."

Ken smooths his mahogany candle table with its piecrust top, *below*. He uses fine steel wool to give a final luster to his sprayed-on finishes of lacquer or polyurethane. The detail of the carved knee, *right*, reflects the creativity of the builder.

NEVER STRAY FROM ORIGINAL PROPORTIONS

Mistakes may be woodworking's greatest teacher. In reproduction work, the errors usually concern the proportion of a piece, and you never tamper with it.

Ten years ago this chemist-craftsman started to reproduce a Philadelphia high chest (often mistakenly called a "high boy"). "To fit it into our home, I had to scale it down," Ken says. His scaled-down version still isn't finished, because Ken is not happy with the way it looks.

Another early piece taught Ken a lesson about furniture proportion and the human body. "I made a Windsor chair too narrow," he admits, "and also too short — by about 3/4" — to be comfortable."

That mistake wasn't completely Ken's fault. He trusted purchased plans rather than measured drawings. He'll never do it again.

SOMETIMES, SAWN WOOD WON'T WORK

Ken has another Windsor chair in his workshop now, and he'll do justice to what he calls "one of the great pieces of American furniture."

Wait a minute — American? True, according to Ken. While the name is British, a Windsor chair from England bears no resemblance to an American version. "American Windsors are unique designs. They're extremely conservative in materials and very strong, yet light," he explains.

Windsor chairs were always painted, too — either black, green or red — in order to conceal the different kinds of wood used in them. The seat was pine, because it



shaped easily. Legs were maple or cherry for strength. And ash or hickory was fashioned into spindles because they bent readily.

"Spindles for a Windsor chair must never be sawn," he says. "You can't saw them, *then* make them round. They must be split along the grain, then split again. That way, the grain runs perfectly true through the entire length of the spindle so that it will be extremely strong and flexible. And final shaping must be done with a drawknife, because you can't easily lathe-turn long spindles."

For making Windsor chairs, Ken owns a drawknife or two, and a scorp. A scorp works much like a drawknife, but has a curved blade. Ken uses it to carve the seat to form.

IT'S NOT TOOLS THAT COUNT, IT'S TECHNIQUE

"For a Windsor chair, I carve with a new scorp, but I employ traditional techniques because that's the only way to build it," Ken comments. "I use antique tools when they are the best ones to use."



Windsor chairs were always painted either black, green, or red to cover the many types of wood from which they were made. Ken likes to use high-gloss, oil-base paint.



Ken designed the decoration and the shape of the drop-leaves on this walnut Pembroke table from the Federal period of about 1820. The inlay is holly.

Many of Ken's antique tools come from farm auctions, but he's proudest of a set of 200-year-old carving chisels that came to him from an unexpected source.

His carving chisels belonged to Calvin Allen, master woodcarver for Chickering Piano Company of Boston, who died in 1887 at the age of 81. After his death, Allen's co-workers wrapped up the chisels and placed them carefully in his tool chest where they lay until Mildred Allen, the carver's 92-year-old granddaughter, brought them to Ken. As an emeritus professor of physics at Mount Holyoke, she had heard of Ken's work and wanted him to see the chisels and possibly use them. He bought them for \$100, and considers them a treasure.

Besides his coveted chisels and other hand tools, Ken uses a table saw, a band saw, and a planer. But, he believes he could build period furniture with just a handsaw, a plane, some chisels, a mallet, and some measuring tools.

MODERN LESSONS IN WOOD AND FINISHES

Besides his teaching responsibilities in organic chemistry, Ken shares his knowledge of furniture design and construction with students on campus in a course on the subject, and in another about antique furniture.

"Hundreds of years ago, cabinetmakers did a lot of things wrong in terms of how wood behaves," Ken notes. "Today, our understanding of wood is much better." That means that when Ken plans a piece of furniture, he often alters grain direction from the traditional so the wood won't split.

But, as did those craftsmen of days gone by, this craftsman often uses air-dried stock, such as the favored walnut from a tree felled on campus several years ago. Besides that plentiful supply, Ken likes to use mahogany and cherry, as well as the species in Windsor chairs.

And because he wants surfaces of

his pieces to stand up to daily use, he departs from the traditional shellac widely used by cabinetmakers one and two centuries ago. Instead, Ken sprays on lacquer or polyurethane, finishes that might alert most antique fanciers to the 20th-century origins of his reproductions. The average person, however, couldn't tell the difference.

DON'T BITE OFF MORE THAN YOU CAN CHEW

Like many woodworkers, Ken uses his woodworking skills to take his mind off his college work and relax. He doesn't sell his pieces, and never plans to. To Ken, building reproductions is a fulfilling hobby.

Louise Williamson comments: "Ken seems to do his best work when he's had a really hard day at the lab. He can let his mind rest and his hands do the work."

What does Ken suggest for beginners who'd like to try a period piece? "Start with a simple project, such as a night stand or a candle table. Choose one from the Federal period, without any decoration, that has a triangular shape, one drawer, and straight, tapered legs. Don't try a chair — they're the most difficult of all. Never bite off more than you can chew."

For more information about period furniture, Ken Williamson suggests the following books, available at local libraries.

On construction:

● *Fine Furniture for the Amateur Cabinetmaker* by A.W. Marlow, 1955, Bonanza Books, N.Y.

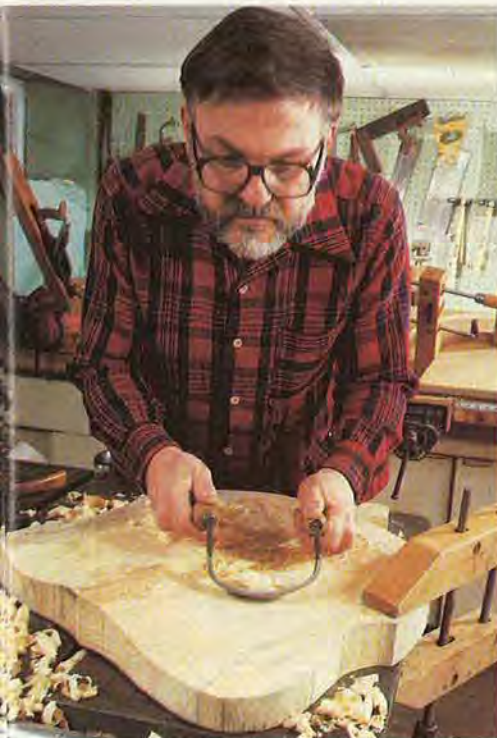
On styles:

● *American Furniture, Queen Anne and Chippendale Periods* by Joseph Downs, 1967, Viking Press, N.Y.

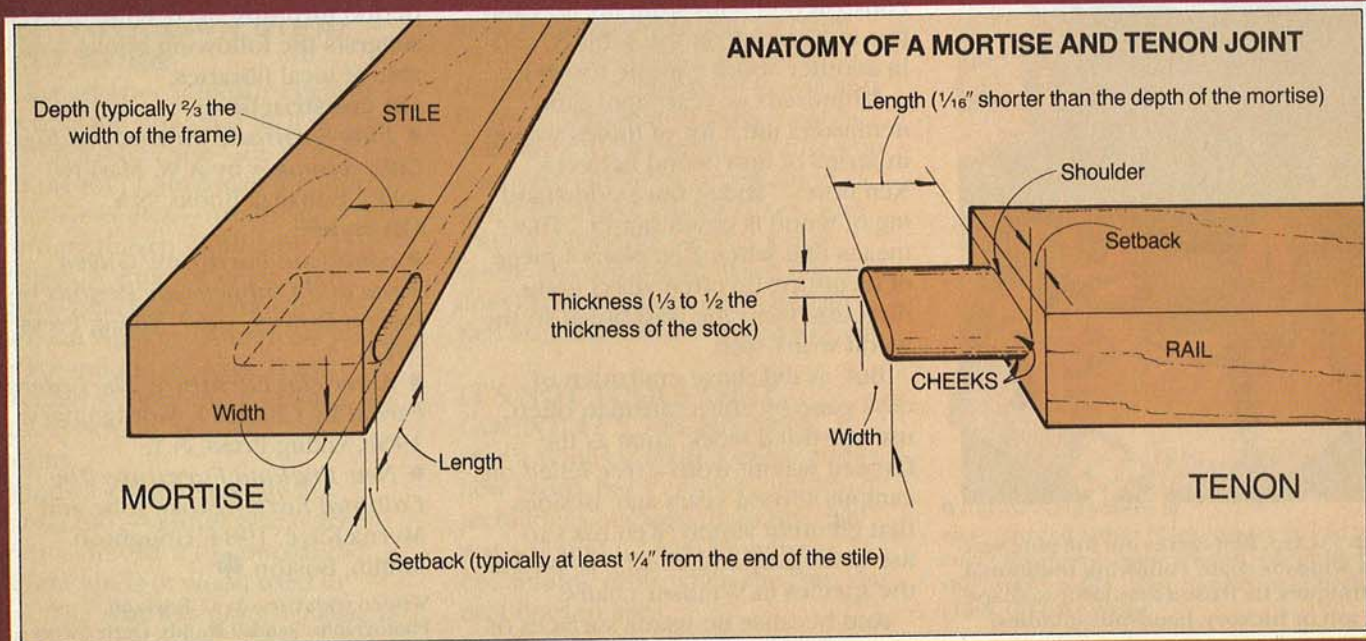
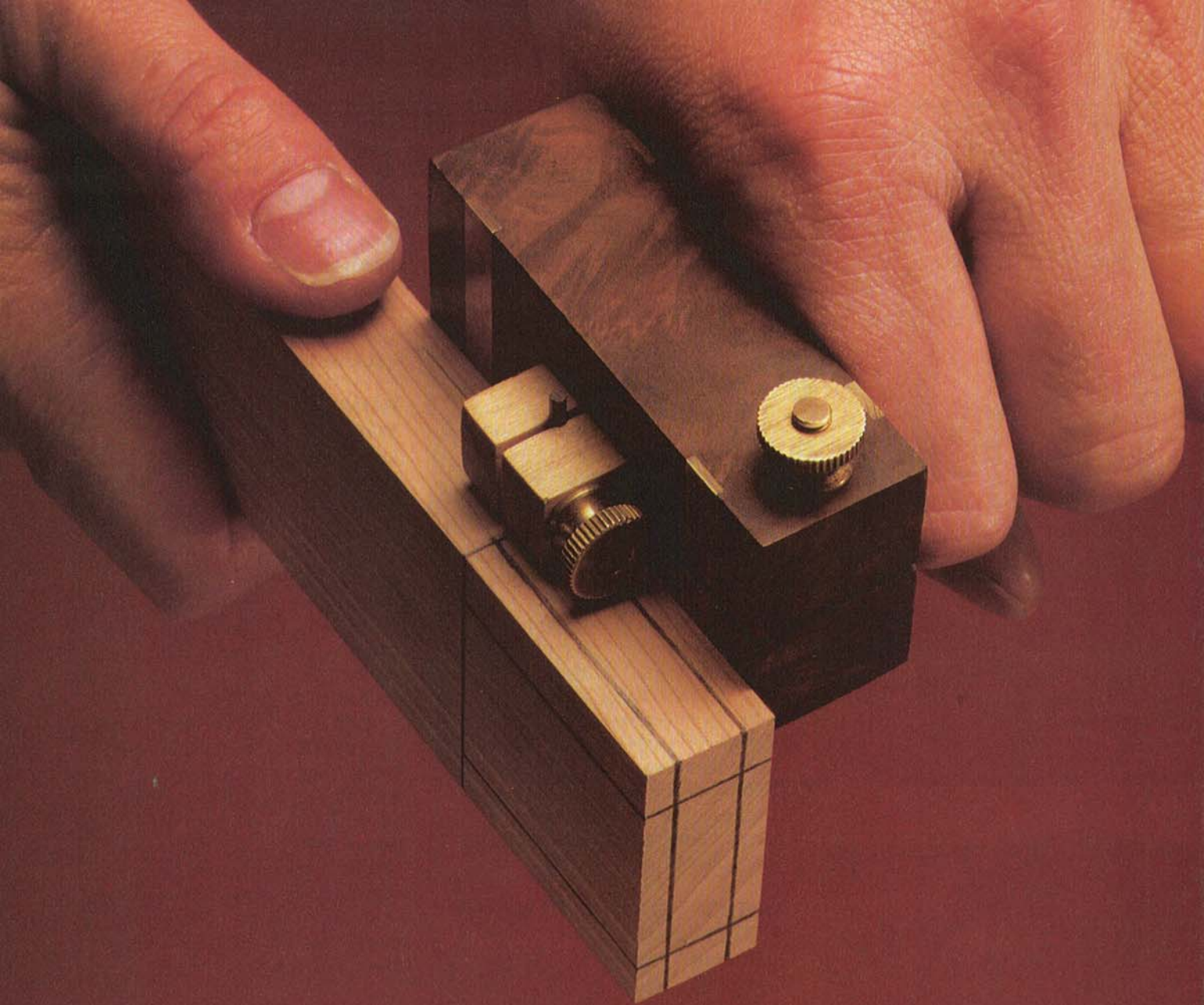
● *American Furniture, The Federal Period* by Charles F. Montgomery, 1966, Viking Press, N.Y.

● *New England Furniture: The Colonial Era* by Broke Jobe and Myrna Kaye, 1984, Houghton Mifflin, Boston. 🍀

Written with Gregory C. Erickson
Photographs: Randall Foulds, Ozzie Sweet



With a scorp, Ken carves out the pine seat of a Windsor chair. Following traditional techniques, he'll use a drawknife to shape the ash or hickory, handsplit spindles.



BASIC MORTISE AND TENON JOINERY

Our mortising jig and a plunge router make the going easier and more accurate than ever before.

For some reason, the words “mortise and tenon” scare lots of woodworkers. Many hobbyists assume that only true craftsmen have the skills necessary to master this superstrong joint. Not so! Anyone willing to invest the time it takes to read this article, and make the mortising jig we have developed, can fashion good-looking, tight-fitting joints the first time out.

While many variations of the mortise and tenon exist, getting into all of them at the outset will only confuse you. That’s why we decided to concentrate on the basics. We’ll use a simple frame with hidden mortise and tenon joints as the example, but the information we present applies to other situations as well.

Before reading on, you may find it helpful to study the sketch at left. It will familiarize you with the terminology we’ll be using later on. It also gives you some standard sizing information for mortises and tenons.

Note: If you want to know how to lay out mortise and tenon joints for raised panel doors or for joining the legs and aprons of tables (or the legs and rails of chairs), see page 83.

CUTTING THE FRAME MEMBERS TO SIZE

After determining the finished size of the frame you want to construct, cut the stiles and rails to size. Don’t forget to factor the length of the tenons into the length of the rails. Cut an extra rail, too — it will serve as a layout template.

LAYING OUT THE MORTISES AND TENONS

You’ll be handling the various frame members a lot during and after layout. So, to avoid confusion (not to mention cutting errors), start by carefully laying them out, faceup, as they will be when assembled. Then, number each joint with a pencil, identify the outside edge of each member, and mark the inside edge of each rail on both ends of each stile, as shown, *below left*.

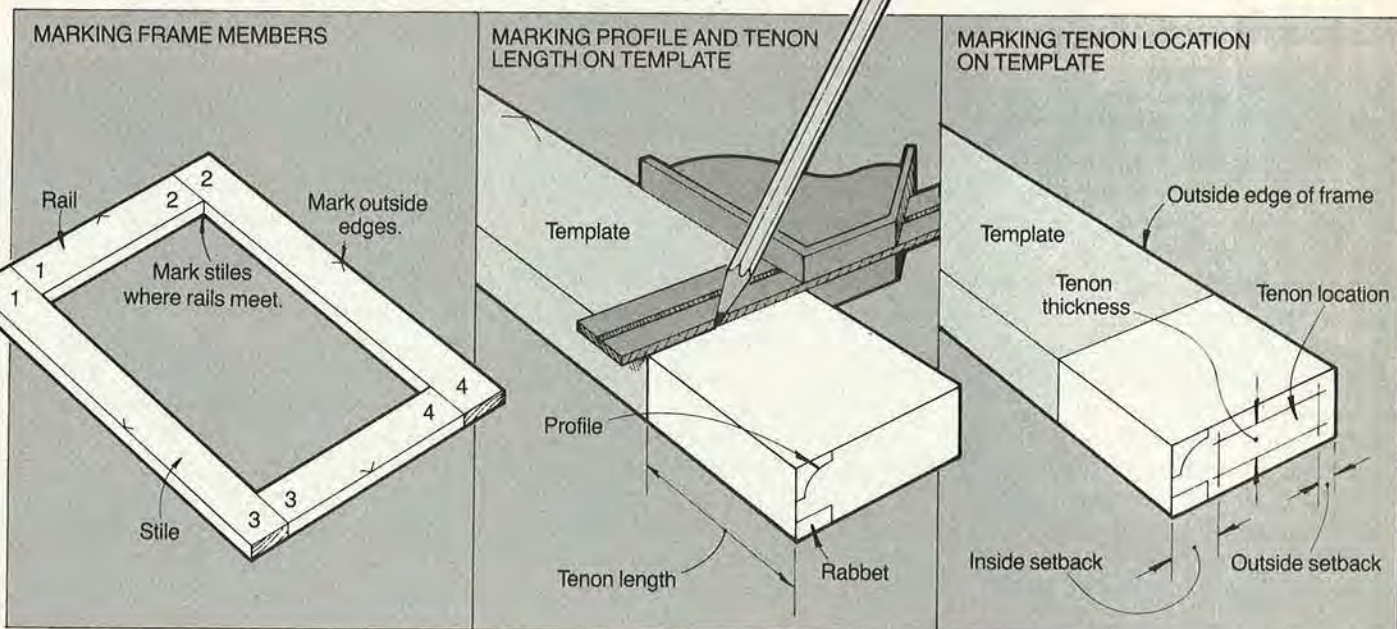
Now, make yourself a layout template, using the extra rail you cut earlier. First lay out any rabbets, grooves, or profiles you plan to cut into the frame members. Then, using a square, mark the length of the tenons on the template as shown, *below center*. Remem-

ber that the length of hidden tenons typically equals $\frac{2}{3}$ the width of the mortised frame members.

Next, with a marking gauge, lay out all four of the tenon’s borders on the template where shown in the sketch, *below right*. You may want to refer back to the anatomy drawing, *opposite*, and review the standards presented there.

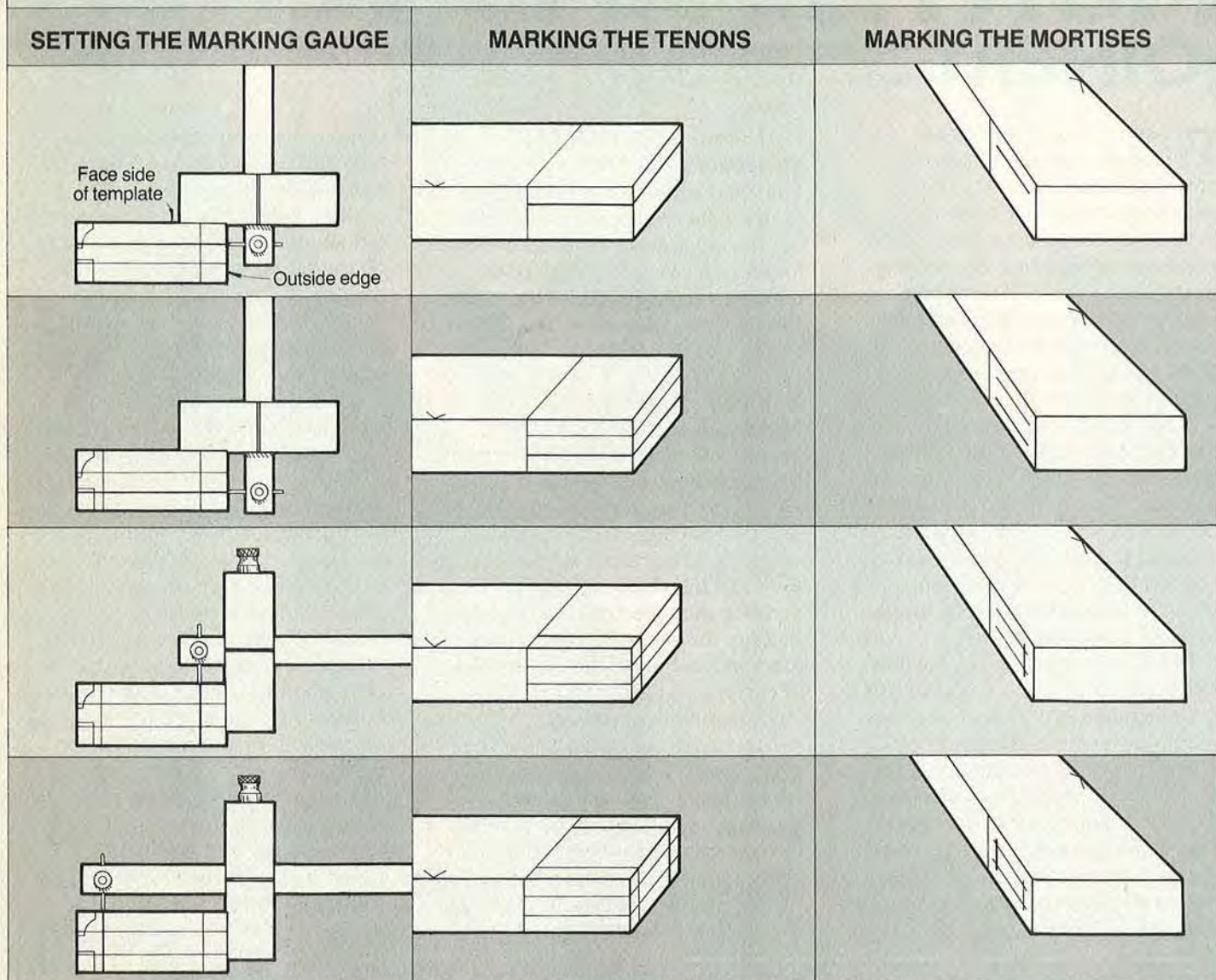
Once you’ve marked the template, use it and the marking gauge to transfer all of the lines from the template onto the frame members. The series of sketches on the following page shows you the progression we use to do the layout work. Note that once we set the marking gauge each step of the way, we mark both the mortise and tenon on all of the rails and stiles before changing the setting. Doing this ensures that the mortises and tenons will be mirror images of each other. Note also that we set the gauge from the face side of the template for both lines that define the thickness of the tenons. This is just in case the members vary slightly in thickness.

Continued



MORTISE & TENON JOINERY

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OUR MORTISING JIG

IT DOES THE JOB QUICKLY AND ACCURATELY

As you probably know, there are several ways to cut mortises, both by hand and with machines. Cutting mortises by hand has always seemed too labor-intensive to us, especially if we have lots of them to make. And while you can purchase a mortising attachment for your drill press, if you have one, we think our jig is faster and more accurate.

The Exploded-View Drawing and the detail drawings that accompany it (opposite page) give you the information you need to build the jig. And

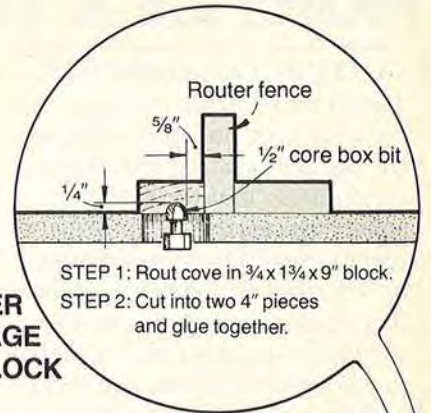
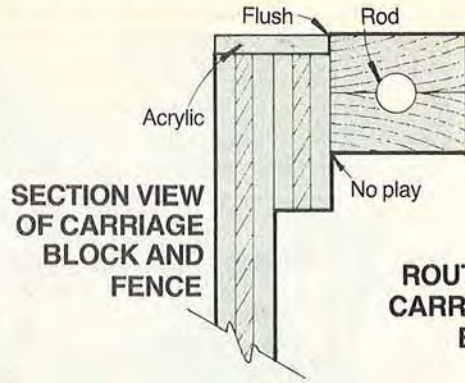
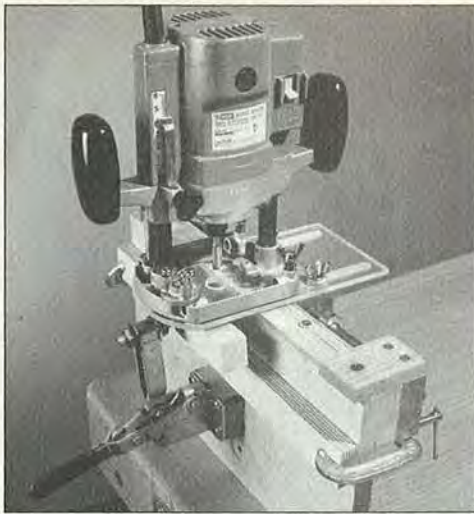
on the following page we show you how to set it up and use it.

Note: The jig does require that you have a plunge router to make the cuts. If you don't have one already, we think the money you spend on this versatile tool will be well worth it. It not only makes cutting mortises a snap, you can also put it to good use for cutting stopped dados and grooves, template routing, and many other cutting chores. Several router manufacturers have one or more

plunge models in their line. Also, you'll need a long-shanked, carbide-tipped straight router bit.

BUYING GUIDE

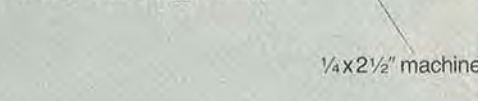
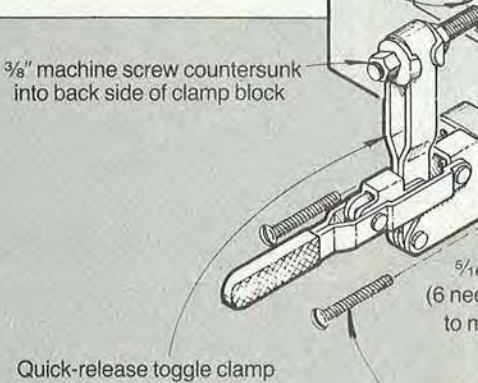
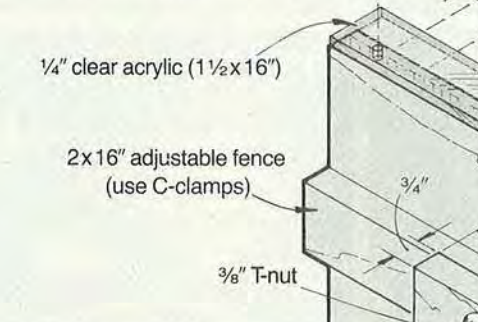
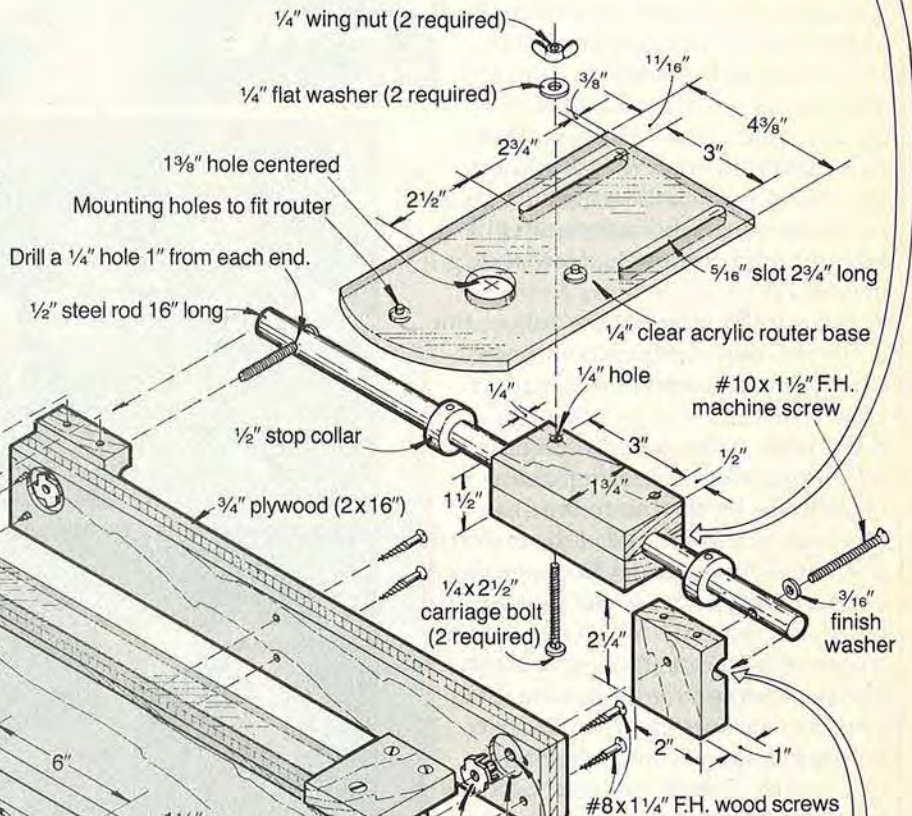
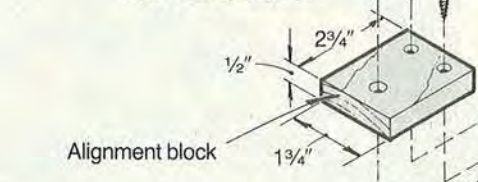
- **Quick-release toggle clamp.** Catalog no. 173-003, \$16.95. Woodworker's Supply, 5604 Alameda, NE, Albuquerque NM 87113 (800/645-9292).
- **Stop collars.** 1/2" set collars. Stock no. S/C 1/2, 65¢ each. Standard Bearings, P.O. Box 823, Des Moines, IA 50304 (515/265-5261).



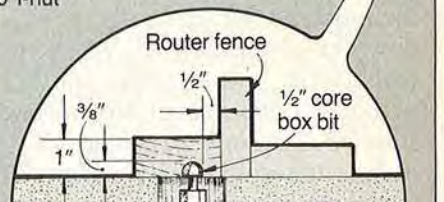
STEP 1: Rout cove in 3/4 x 1 1/4 x 9" block.
STEP 2: Cut into two 4" pieces and glue together.

- #8 x 1" F.H. brass wood screws
- #10 x 1 1/2" F.H. brass wood screws

MORTISING JIG



ROD SUPPORT BLOCK



STEP 1: Rout cove in 1 x 2 1/4 x 5" block.
STEP 2: Rip into two 2"-wide pieces.

Continued

MORTISE & TENON JOINERY

CUTTING THE MORTISES

1 Start by securing the jig in a vise. Then, fit one of the stiles in the jig, and position and clamp the fence so that the stile fits snugly against the alignment blocks. **Note:** Always check to be sure that the face side of the piece being mortised is against the jig. Doing this ensures that the face side of frame members will be flush with each other.

2 Slide one end of the stile toward the center of the jig, and clamp it there with the hold-down clamp.

Now, loosen the wing nuts holding the router base in place, and carefully center the router bit over the mortise. Retighten the wing nuts. Don't worry too much about the router base being exactly perpendicular to the jig; it needn't be.

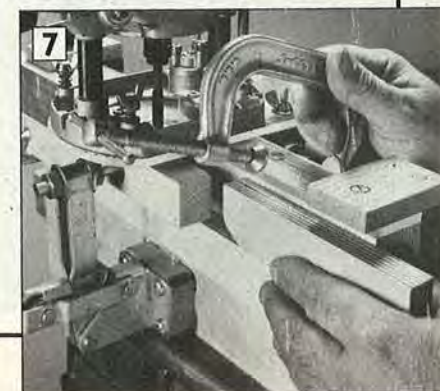
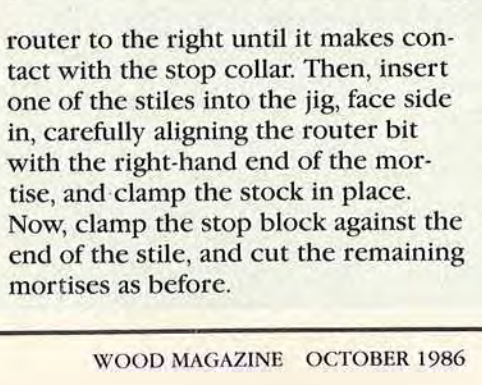
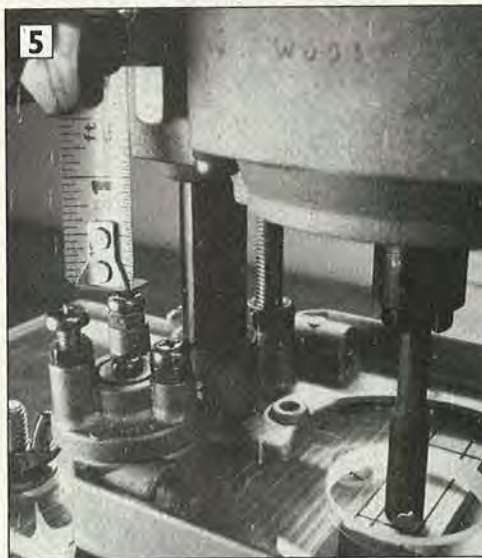
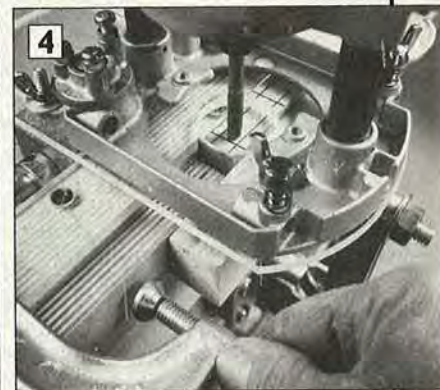
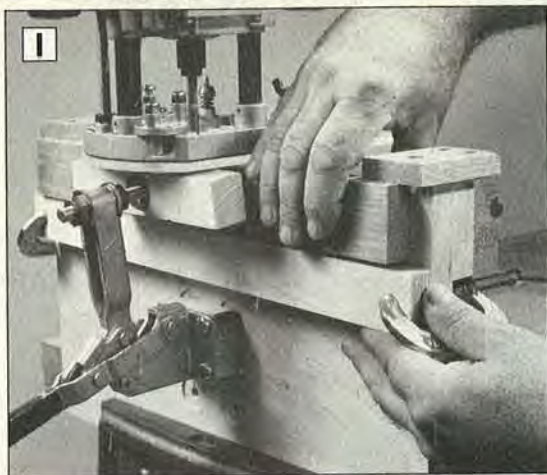
3 To limit the travel of the router, line up the bit with each end of the mortise and set the stop collars with an allen wrench.

4 To ensure consistent placement of succeeding mortises, clamp a stop block to the jig. Be sure to snug the block up against the end of the material.

5 When setting the depth of cut, keep in mind that you want the mortise to be approximately $\frac{1}{16}$ " deeper than the length of the tenon. This extra depth forms a reservoir for glue that will be forced to the bottom of the mortise during glue-up. If you don't provide space for the glue to build up, even with heavy clamp pressure you may not be able to bring the stiles and rails completely together to form a tight joint.

6 It's best to make several shallow passes with the router when cutting the mortises. We generally move down in $\frac{1}{4}$ " increments. When you've reached the bottom, make another plunge at both ends of the mortise to remove any minor irregularities that may be left from previous cuts. When you're finished with the first mortise, remove the stile and insert the other one, again making absolutely sure that the face side rests against the jig.

7 To cut the mortises at the other end of the stiles, you need to move the stop block to the other side of the router bit. To position it correctly, first slide the



router to the right until it makes contact with the stop collar. Then, insert one of the stiles into the jig, face side in, carefully aligning the router bit with the right-hand end of the mortise, and clamp the stock in place. Now, clamp the stop block against the end of the stile, and cut the remaining mortises as before.

CUTTING THE TENONS

1 Place one of the stiles face side down, on your table saw, and set the height of the blade, using the mortise as a guide.

2 Now, using your layout template, set the rip fence to control the tenon length. To ensure that the template is perpendicular to the rip fence, hold the template against the miter gauge.

3 To test the blade height setting, position your layout template, face-down, on the table saw, and make one pass at the end of it. Then check it against one of the mortises as shown. Make any necessary adjustments.

4 Remove the material from the face side of each end of each rail. You will notice some saw marks left by the dado blade, but don't worry about them. The tenons needn't be smooth.

5 Again using your template, this time with the *back side facing down*, cut away a portion of the material from its back side. Now, check the fit of the tenon in one of the mortises. You want a snug, but not a tight, fit. Raise or lower the blade to adjust the thickness of the tenon, if necessary, then remove the material from the back side of each end of each rail.

6 To remove the material from the outside and inside setback portions of the tenons, turn once again to your trusty template, elevate the blade to the proper height for each setback, make test cuts on your template, check them against the mortise, and remove the remaining material.

7 To round off the corners of each of the tenons, we use a sanding belt wrapped around a piece of plywood. With it, we chamfer each corner and round it over slightly. Take care not to sand the top and bottom cheeks of the tenons, though. By doing so, you can cause distortion of the frame members. Also be sure to hold the sanding block square to the tenon. Accidentally beveling the tenons will weaken the mechanical strength of the joint.

8 After rounding the corners, you'll still need to remove some material at the base of the tenons. Otherwise, you'll find that the joints won't close all the way. We use a chisel to remove the excess material.

GLUING AND CLAMPING THE FRAME

If you've made all of your cuts carefully, this part of the project should be a piece of cake. It's a good idea to dry-clamp the frame to make sure that the members fit together tightly and that the face sides of the frame members are flush.

If everything checks out, apply glue to both the tenons and the mortises, assemble the frame, and clamp until the glue sets up. Be sure to check the frame for square while the glue is still wet. ♣

Produced with James R. Downing
Written by Larry Clayton
Photographs: Hopkins Associates
Illustrations: Bill Zaun



FASCINATING FIGURE

A Glimpse at 7 of the Forest's Finest, Each with a Tale to Tell

Figured wood makes an eye-catching accent when combined with straight-grained stock in your projects. And when you know how and why Nature created it, your work becomes a story in itself.

Trees, like people, are individuals. One tree, felled and opened by the saw, may contain beautifully figured wood. Its neighbor a few feet away may turn out quite plain. Even within the same tree, figure can occur in one area and not in another. You can also find more varied types of figured wood in one species than another, and trees which produce spectacular figure of just one type in limited quantities. That's why figured wood has always been eagerly sought and highly prized for special projects.

You can't consider figured wood rare, only special. Because it represents only a small portion of all the wood available, and in most cases requires extra processing, that specialness translates to higher cost. But used sparingly in your woodworking, figured wood becomes an accent, elevating a project above the ordinary.

Where do you buy figured wood? Most hardwood dealers offer some figured solid stock as well as veneers, and they can special order to fill your requirements. Many mail-order wood suppliers carry a variety (check our advertisers and "Facts About Figure" on page 89).

Here and on the following pages, you'll see some spectacular examples of the many figures available, what created them, and how other woodworkers use them.

STUMP FIGURE: BEAUTY BELOW GROUND

Sometimes, you really have to dig to find fine figure. Loggers with a market for stump wood harvest dazzling figure by extracting a tree's entire stump and root system from the ground. With luck, the largest root, called the "tap" root, will yield one or more 3"- to 4"-thick pieces about 30" long. Sections of the stump will be figured, too.

Why such beauty below the ground? As roots grew, combined, and developed offshoots

to feed and support the mass above, the grain direction became whorled, interrupted by the rays of new growth in cyclic spurts.

Best in: Walnut, hard maple, myrtle, manzanita, elm, pecan, and some fruitwoods.

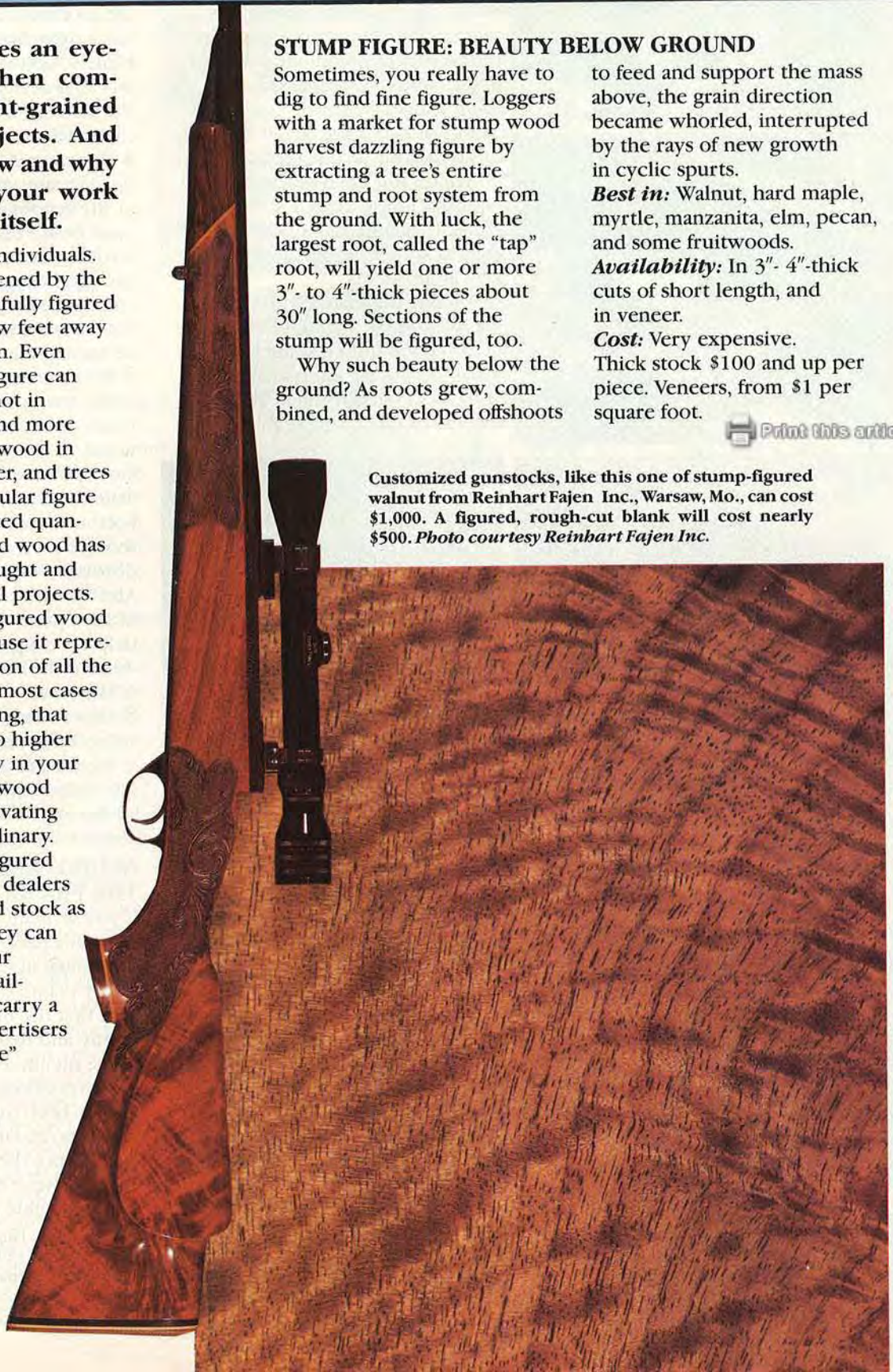
Availability: In 3"- 4"-thick cuts of short length, and in veneer.

Cost: Very expensive.

Thick stock \$100 and up per piece. Veneers, from \$1 per square foot.

 [Print this article](#)

Customized gunstocks, like this one of stump-figured walnut from Reinhart Fajen Inc., Warsaw, Mo., can cost \$1,000. A figured, rough-cut blank will cost nearly \$500. *Photo courtesy Reinhart Fajen Inc.*





The curly maple in this band-sawn box came from a park tree felled for firewood. The tree had engulfed a park bench placed next to it long ago.
Crafted by James R. Downing

CURLY FIGURE: WAVES OF GRAIN

In Japan, the trunks of an ash called *tamo* are bound when young with a heavy rope and left to mature. When harvested and sawn, the wood displays superb curly figure. The reason: Constriction causes a break in the normally even flow of nutrients through the wood. In response, the tree actually grows in spurts, producing wavelike grain that resembles water flowing over a rock-strewn streambed.

The same thing happens naturally when a tree grows over and around something lodged against it, such as a park bench, barbed wire, or a vine. Curly figure will run throughout the tree.

Best in: Maple, cherry, and walnut. Pecan can be quite exquisite.

Availability: As lumber and veneer.
Cost: About 30 cents more per foot in lumber and veneer than nonfigured.



Stringed instruments benefit from the acoustics created by the uneven grain of bird's-eye maple. This dulcimer has unusually dense figure.
Crafted by Don Mostrom

BIRD'S EYE: A BUDDING PROMISE

What makes a tree suddenly decide it wants more limbs, then just as quickly change its mind? Even wood technologists can only guess at the reasons behind this phenomenon, but they do know it causes bird's-eye figure. Those little eyes were once destined to be more tree!

You can sometimes spot a tree with bird's-eye potential. Little bumps, or pimples, on the bark suggest the possibility.

Bird's-eye occurs in all tree species, but only in *one part* of a tree. That may be because only one part of the tree received the budding stimuli. There's also a rare, enlarged bird's-eye figure called "fish-eye," which looks like a salmon peering out at you.

Best in: Maple, walnut, white oak, cherry, and some exotic hardwoods.

Availability: In boards, veneer.

Cost: Around \$1 more per foot of volume.

Continued

FASCINATING FIGURE

FIDDLEBACK: NOT JUST FOR DO-SI-DO

In the 1800s, a violin without a back made from closely striped maple wasn't fit for a hoedown. Today, we call any wood with that figure fiddleback, but its use as an interesting twist in color or as a design feature has spread far beyond musical instruments.

Fiddleback figure comes from trees that have had their growing process interrupted, as curly figure has. But to classify as fiddleback, the cross-grain stripes have to be much closer together than in curly figure — in the neighborhood of 9 or more per inch. While no one actually counts the density of stripes, woodworkers prize fiddleback when they see it.

Best in: Maple, walnut, and mahogany.

Availability: Veneer. Harder to get in lumber.

Cost: Approximates bird's-eye.



Fiddleback walnut veneer adds dazzle to the design of this fold-out tabletop. Close-knit stripes across the grain mark the wood as exceptional.

Solid stock such as this would be rare, and costly. *Crafted by Paul McClure*

This solid-walnut replica of an 1840 china cabinet was made using only hand tools. All stock, including the crotch wood on the lower doors, came from the same tree, which was sawn by steam power into lumber. *Crafted by Randy Welle*



CROTCH WOOD: LOOK FOR AN EQUAL DIVISION

Horsetails, feathers, fans — you'll see all these in the swirls, spirals, and splashes of crotch wood.

Except for towering conifers, all trees have crotches, where the main trunk divides on its way to the branching canopy. But the best crotch for figure comes just below a division into two equally sized members. The larger and more equal the limbs are, the longer the crotch and the lovelier the figure.

Growth rings and grain in crotch wood have gone wild in the tree's division and realignment. If you were to saw crotch wood into slices starting in the sapwood, the figure would become progressively more impressive as you neared the heartwood.

Best in: Walnut, maple, and cherry. Others pretty. Oak is bland.

Availability: Rare in lumber, except for 3" - 4"-thick blanks. Common in veneer.

Cost: Veneer about \$2 per square foot; blanks start at \$100.

BURL: FOREST FIRST AID

Trees heal wounds themselves — not with a bandage, but with a burl. Burls slowly form over most wounds like a permanent scab. Insects or parasites in a tree can also trigger this protective mechanism. In Europe's Carpathian Mountains, a soil parasite causes elm trees to burl extensively, producing world-renowned figure.

Because most burls are small and often hollow, they're primarily made into veneer. Manufacturers peel them, just as you would an apple, then cut the spiraling curl into sections and match and rejoin them.

Best in: Aspen, elm, and olive. Walnut proves elegant, too. Oak and maple burls are less highly figured.

Availability: Veneers, solid burls.

Cost: About \$3 square foot in veneer, burls at varying prices by weight or size.



An Aaron Willard-style 1790 tall-case clock impresses you with its door and base faced with walnut burl veneer. Clockmakers often use burl. Carpathian elm burl, shown close up, rates highly. *Crafted by William Hopkins, Sr.*

KNOTS: WORTH A SECOND LOOK

In the strictest sense, knots don't count as figure. Yet, you can use knots and the eddying grain around them effectively. And they, too,

have a story that starts deep inside the tree.

Knots represent lost limbs: In the heartwood, the trauma occurred long ago; in sapwood, more recently. If you see a dark ring around a knot, that's ingrown bark, a warning that the knot will eventually fall out when the bark works loose.

Best in: All lower-grade boards.

Availability: Abundant.

Cost: Inexpensive. 🌲

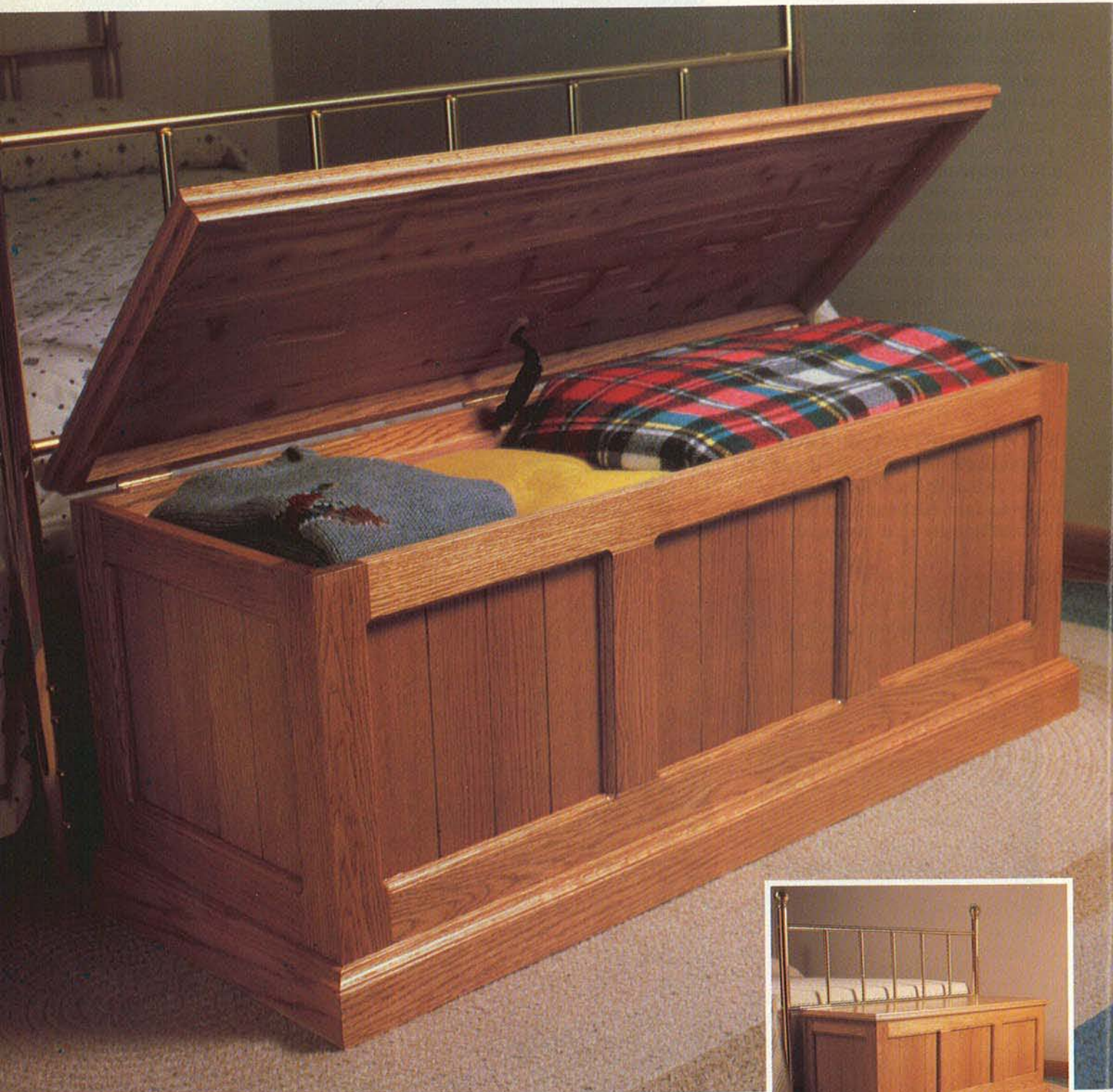
A Swedish craftsman made this empire-style desk and chest over 100 years ago, using lowly knots advantageously. The wood could be pine or birch — the exact species is unknown. Many knots are sound and can be decorative. *Courtesy of The Classics, Designer Interiors*



See related article, "Facts About Figure" on page 89.

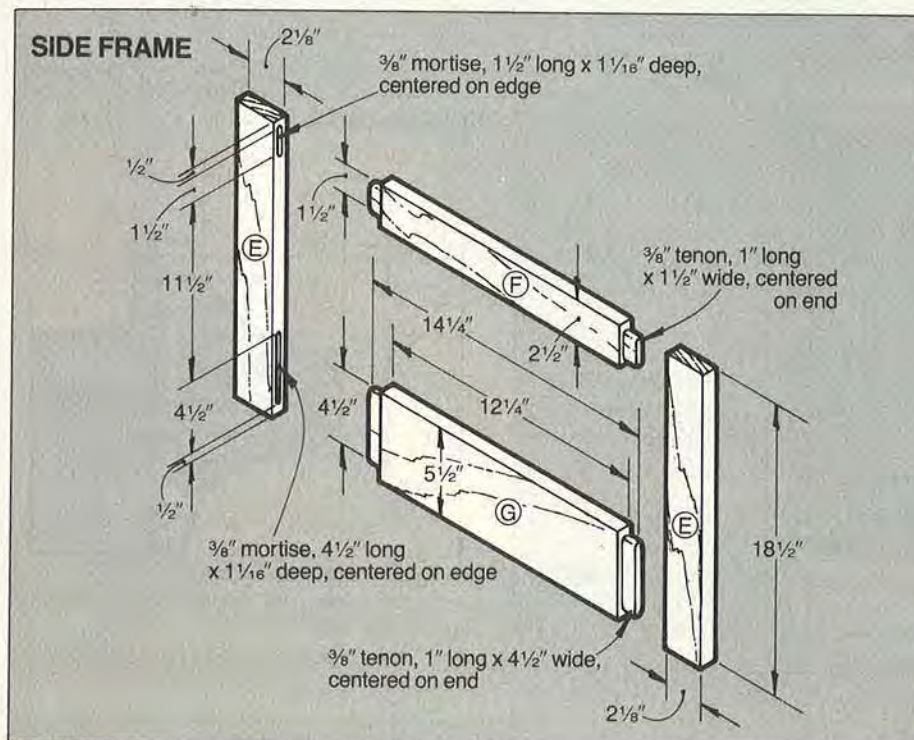
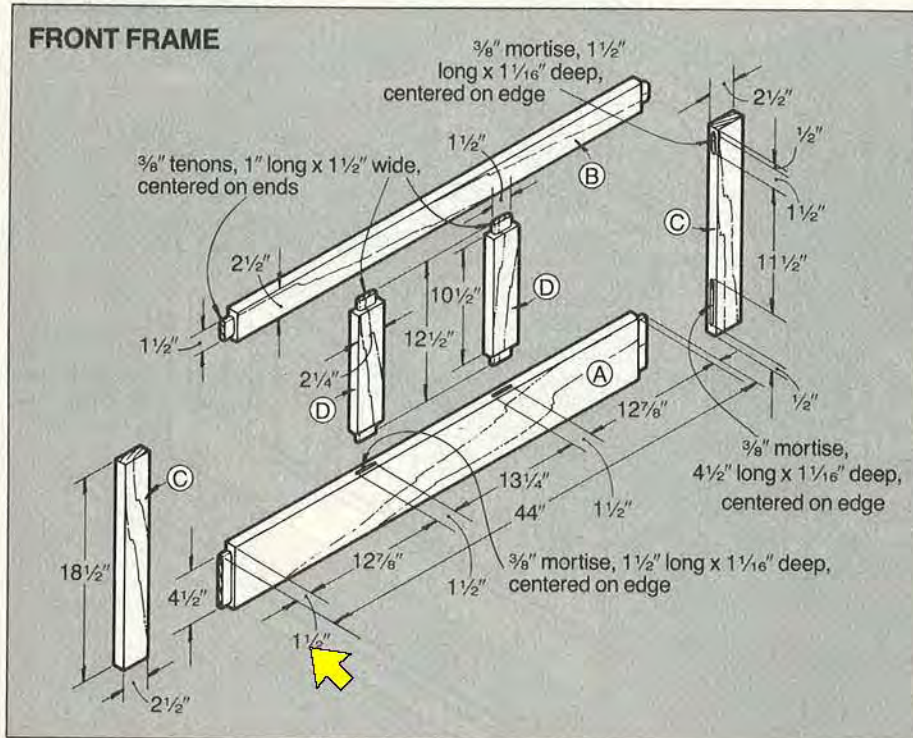
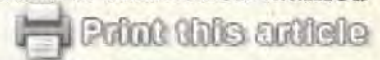
Produced by Peter J. Stephano, with
Wood Technologist Paul McClure
Photographs: Hopkins Associates,
Jim Kascoutas, Ed Sargeant

An Heirloom Chest



to Cherish

There's *nothing* like the fragrance of cedar. And no wood matches the durability and popularity of oak. That's why we combined the two in this mortise-and-tenon-framed storage chest.

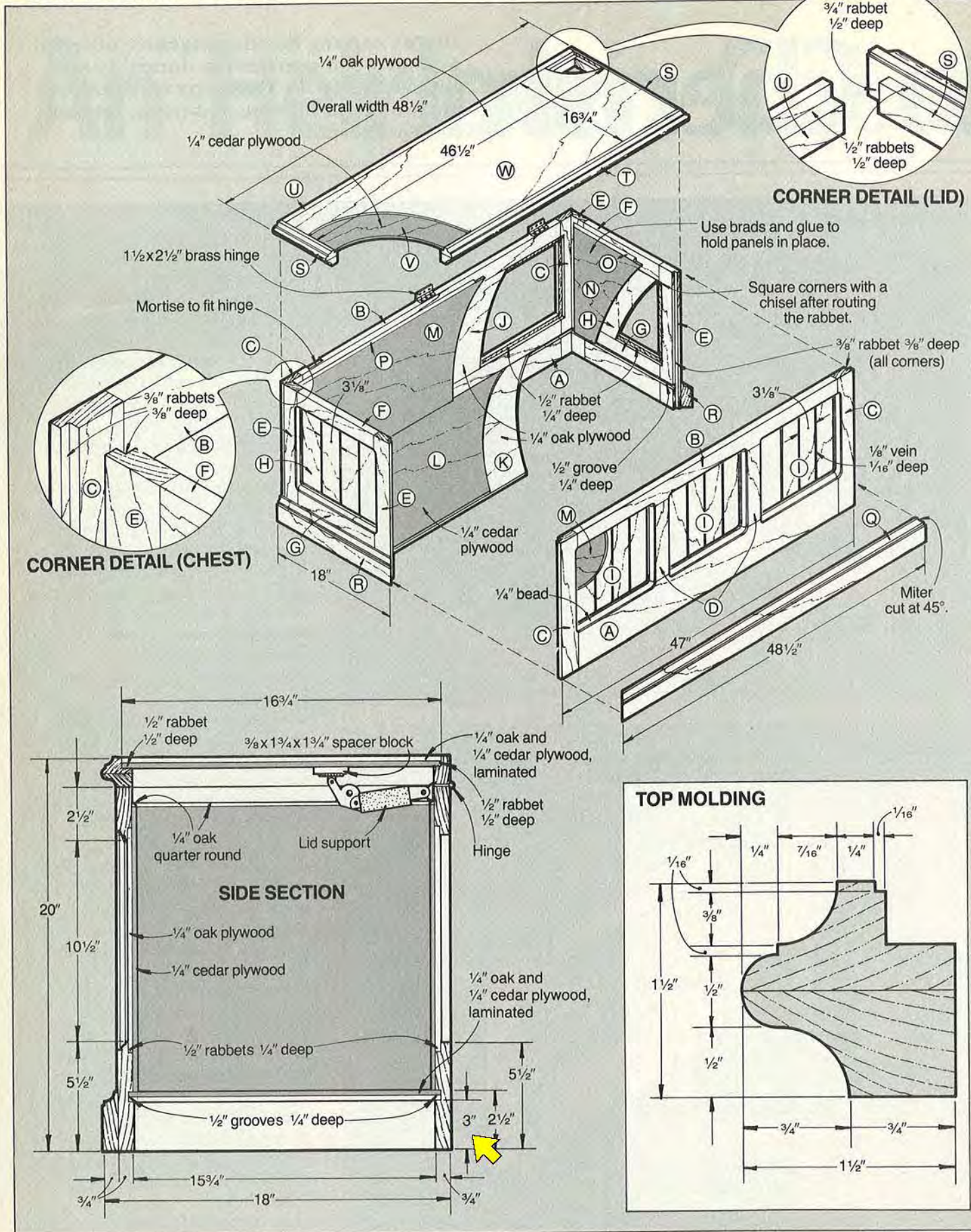


CONSTRUCTING THE FRAME

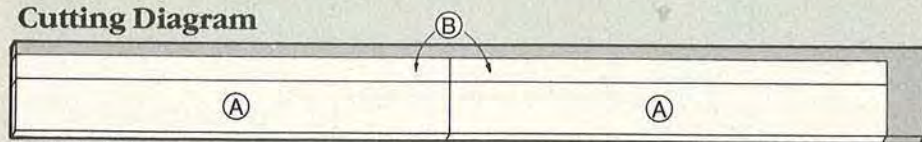
- 1 Cut the front and back frame members — rails (A and B), stiles (C), and mullions (D) — to the sizes listed in the Bill of Materials. Note that the back frame does not have the two center mullions (D).
- 2 Cut the side frame members — stiles (E) and rails (F, G) — to size.
- 3 Lay out and cut the mortises and tenons in the frame members where indicated in the Front and Side Frame Drawings, *left*. If you're not familiar with how to make mortise and tenon joints, please refer to the "Basic Mortise and Tenon Joinery," *page 36*, for the particulars.
- 4 Glue and clamp the front frame together, checking for square, and adjusting if necessary. Repeat the procedure with the other frames. After the glue dries, scrape off the excess, and sand the joints smooth on both sides.
- 5 Fit your router with a rabbeting bit, and rout 1/2" rabbets 1/4" deep along the inside edges of all four frames where shown in the Exploded-View Drawing on the following page. (We used a scrap of 1/4" oak plywood to check the depth.) Square the rounded corners with a chisel. The rabbets will later house the oak plywood panels.
- 6 Now, turn the frames over, and rout a 1/4" bead along the inside edges of all four frames where shown in the Exploded-View Drawing.
- 7 Attach a dado blade to your table saw, and cut a 1/2" groove 1/4" deep 2 1/2" up from the bottom of each of the four frames for the chest bottom where shown in the Side-Section Drawing, *page 48*.
- 8 Cut a 3/8" rabbet 3/8" deep along each end of each frame where shown in the Chest-Corner Detail of the Exploded-View Drawing.

Continued

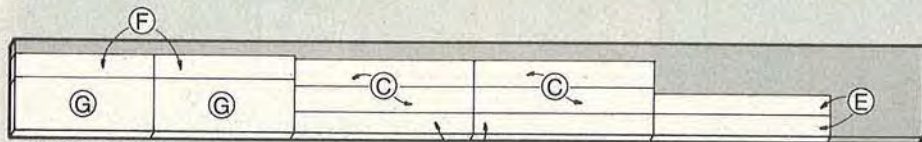
Heirloom Chest



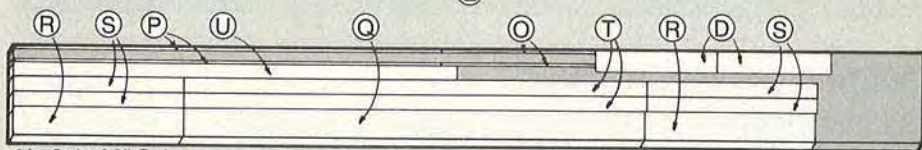
Cutting Diagram



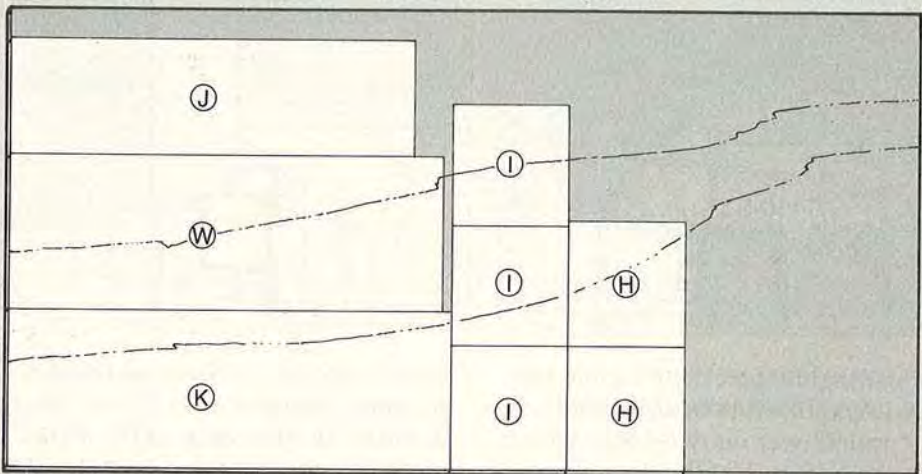
3/4 x 9 1/4 x 96" Oak



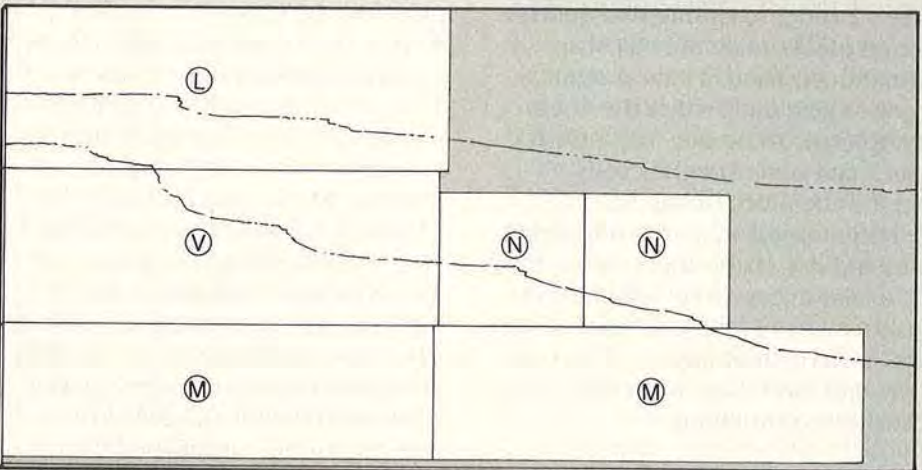
3/4 x 9 1/4 x 96" Oak



3/4 x 9 1/4 x 96" Oak



1/4 x 48 x 96" Oak Plywood




1/4 x 48 x 96" Cedar Plywood

Bill of Materials

Part	Finished Size *			Material	Qty.
	T	W	L		
A	3/4"	5 1/2"	44"	oak	2
B	3/4"	2 1/2"	44"	oak	2
C	3/4"	2 1/2"	18 1/2"	oak	4
D	3/4"	2 1/4"	12 1/2"	oak	2
E	3/4"	2 1/8"	18 1/2"	oak	4
F	3/4"	2 1/2"	14 1/4"	oak	2
G	3/4"	5 1/2"	14 1/4"	oak	2
H	1/4"	13 1/4"	11 1/2"	oak plywood	2
I	1/4"	13 1/2"	11 1/2"	oak plywood	3
J	1/4"	11 1/2"	43"	oak plywood	1
K*	1/4"	16 3/16"	45 15/16"	oak plywood	1
L*	1/4"	16 3/16"	45 15/16"	cedar plywood	1
M	1/4"	14"	45 1/2"	cedar plywood	2
N	1/4"	14"	15 1/4"	cedar plywood	2
O*	1/4"	1/4"	15 3/4"	oak	2
P*	1/4"	1/4"	45 1/2"	oak	2
Q*	3/4"	3"	48 1/2"	oak	1
R*	3/4"	3"	18"	oak	2
S*	1 1/2"	1 1/2"	18"	oak (laminated)	2
T*	1 1/2"	1 1/2"	48 1/2"	oak (laminated)	1
U	3/4"	1 1/2"	46 1/2"	oak	1
V*	1/4"	16 3/4"	46 1/2"	cedar plywood	1
W*	1/4"	16 3/4"	46 1/2"	oak plywood	1

*Parts marked with a * are cut larger initially, then trimmed to finish size. Please read the instructions before cutting.

Supplies: #8x1 1/4" flathead brass wood screws, 3 - 1/2 x 2 1/4" brass butt hinges, 1/2" brads, stain, , #0000 steel wool, contact cement

Continued

Heirloom Chest

9 Cut the side panels (H), the front panels (I), and the rear panel (J) to size from $\frac{1}{4}$ " oak plywood.

10 To mark the veins on the front and side panels, first locate the vertical centerline on each panel. Next, mark lines $3\frac{1}{8}$ " apart on each side of the centerline. Now, set up a straight-edge, and rout three $\frac{1}{8}$ " veins $\frac{1}{16}$ " deep in each panel (see the Buying Guide for details about the router bit we used).

11 Glue panels H, I, and J in the rabbeted openings in the framework. Remove any glue squeeze-out on the face of the panels with a damp rag immediately after clamping.

12 To fashion the bottom, cut the oak plywood (K) and cedar plywood (L) to size plus $\frac{1}{2}$ " on all sides. Then, laminate the two plywood pieces with contact cement. Finally, trim the laminated panel to finished size ($16\frac{3}{16} \times 45\frac{15}{16}$) with a table saw or with a circular saw and a straightedge. (We cut our laminated panel $\frac{1}{8}$ " shorter in length and width than the dadoed opening to allow for contraction of the framework.)

13 Dry-clamp the chest framework, making sure that the bottom (K, L) doesn't prevent the rabbeted corner joints from fitting snugly. Once the framework fits together correctly, glue and clamp it, checking for square and making sure that the top edges of the four frames are flush.

14 Scrape off the excess glue after it dries. Then, sand all surfaces smooth.

LINING THE CHEST

1 Cut the front and back lining pieces (M) to size from $\frac{1}{4}$ " cedar plywood, keeping the grain direction horizontal. Then, check the fit of the pieces in the chest, but do not glue them in position yet. Cut the side liners (N) to size and dry-fit them, trimming if necessary.

2 Glue and brad the front and back liners in place, then the side liners.

3 Cap the top edge of the liner material with quarter-round molding (O, P). To make these pieces, cut a piece of $\frac{3}{4}$ " oak 2" wide and 62" long (for safety's sake and ease

CUTTING THE QUARTER-ROUND (FULL SIZE)

Step 1. Round-over corner with $\frac{1}{4}$ " round-over bit.

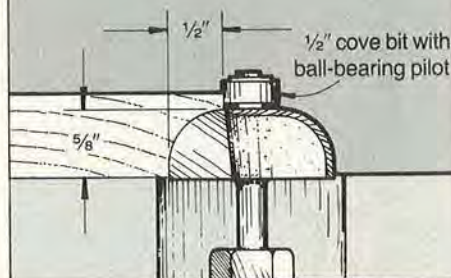
Step 2. Make a cut $\frac{1}{4}$ " in from the edge and slightly deeper than $\frac{1}{4}$ ".



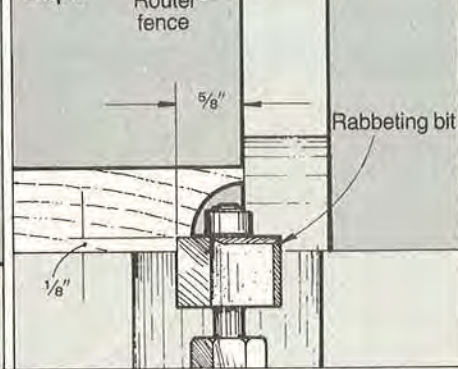
Step 3. Make the last cut $\frac{1}{4}$ " in from the edge and slightly deeper than $\frac{1}{4}$ ".

ROUTING THE BASE MOLDING

Step 1



Step 2



of cutting the pieces on a table saw, we used a 2"-wide board). Rout a $\frac{1}{4}$ " round-over on two edges where shown in Step 1 of the drawing at the top of the page. Then, follow Steps 2 and 3 to rip the two quarter-round pieces from the oak strip.

The thin strips may have a tendency to kick back when the cut is completed. To be safe, use a push block and don't stand directly behind the piece being cut.

4 Miter-cut the side molding strips (O) and dry-clamp them above the $\frac{1}{4}$ " cedar liners. Now, miter-cut the front and back strips (P) to fit. Glue and brad the molding strips in position, and sand them flush with the cedar-plywood lining.

ROUTING THE BASE AND LID MOLDINGS

1 Cut the base molding pieces (Q, R) to size plus 2" in length.

2 Follow the two-step procedure in the drawing, *above*, to rout the

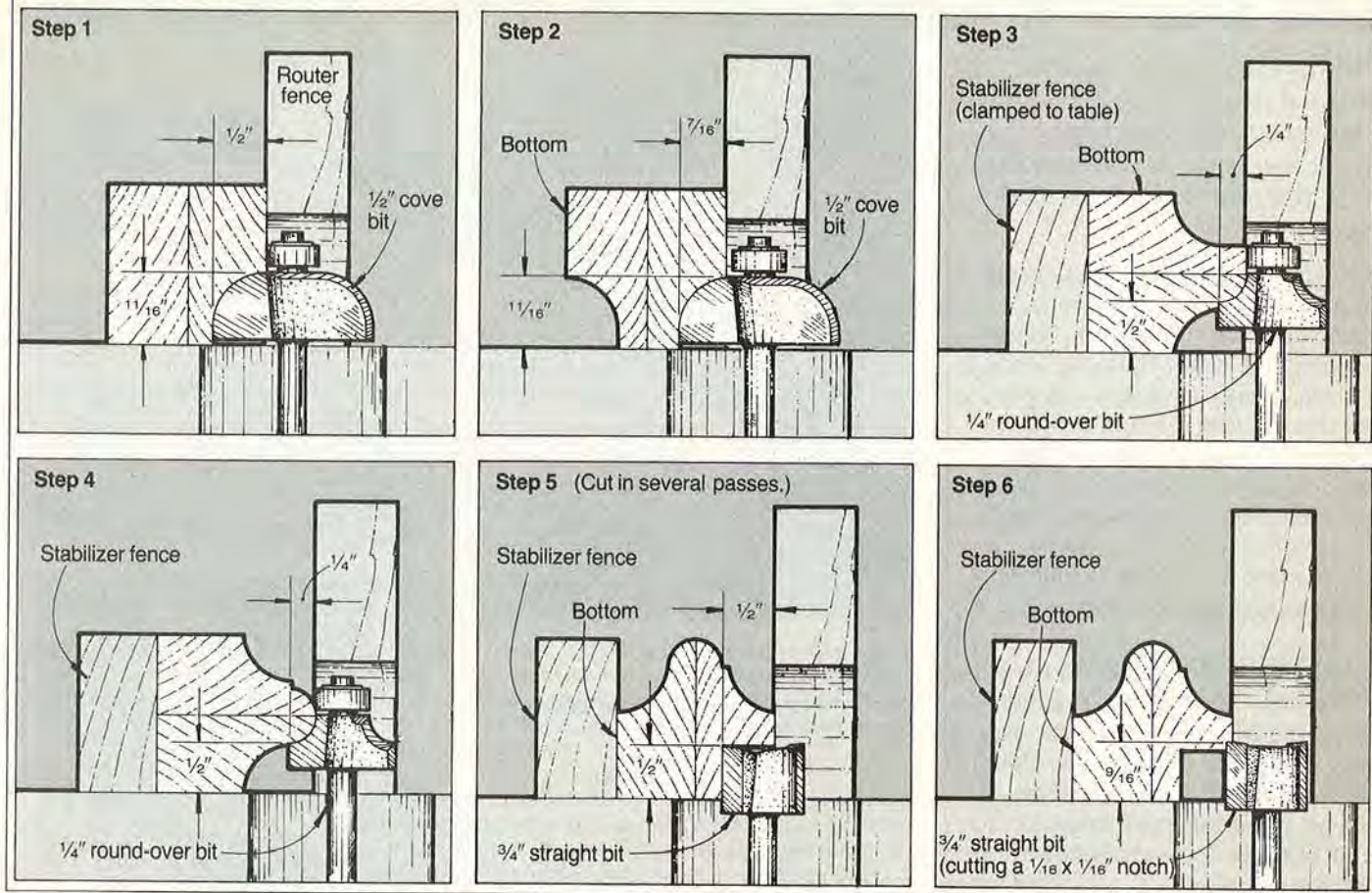
decorative contours on the three molding pieces.

3 Miter-cut both ends of the front piece and the front end of each side molding. Then, glue and clamp the pieces to the chest.

4 To form the lid molding, start by cutting four pieces of $\frac{3}{4}$ " oak to $1\frac{3}{4} \times 20$ " for the sides (S) and two pieces to $1\frac{3}{4} \times 50$ " for the front (T). Laminate the four 20"-long pieces into two blocks that measure $1\frac{1}{2} \times 1\frac{3}{4} \times 20$ ". Do the same to the two 50"-long pieces. (We also formed a scrap lamination about 12" in length for making test cuts. Then, we positioned the router bits as shown, test-cut the scrap, and readjusted the bit as necessary before routing our finished pieces.) Scrape off any excess glue, and rip all three laminated pieces to $1\frac{1}{2}$ " finished width. Also, cut the lid's back trim piece (U) to finished size.

5 Follow steps 1 through 6 in the

ROUTING THE LID MOLDING



series of drawings at the top of the page to rout the decorative molding (R, S). Now, go back and rout a $\frac{1}{2}$ " rabbet $\frac{1}{2}$ " deep along the top inside edge of the back trim piece (U), following the procedure in step 5 of the drawing.

6 Cut the lid pieces V and W to size plus $\frac{1}{2}$ " on all sides. Then, laminate the two pieces with contact cement, and trim the panel to finished size.

7 Glue and clamp the back trim piece to the laminated panel (V, W), keeping the ends flush.

8 Cut a $\frac{3}{4}$ " rabbet $\frac{1}{2}$ " deep in the back end of each side molding piece (S) where shown in the Lid-Corner Detail in the Exploded View Drawing, *page 48*.

9 Miter-cut the side molding pieces (S) and front molding piece (T) to length. Now, glue and clamp them to the lid assembly, being careful not to mar the routed edge. (When clamping, we used scrap spacers

with the clamps for uniform pressure and to prevent marring the oak veneer plywood.)

FINAL CONSTRUCTION AND FINISHING

1 Mortise the back rail (B) and back trim piece (U) for the hinges. Note that the middle hinge is centered and the other two are positioned 4" in from each end.

2 Sand the entire chest smooth, especially the cedar lining, which will remain unfinished. Using masking tape and newspaper, mask the lining, and apply the finish of your choice. (We stained our chest first, then applied several coats of polyurethane, using steel wool between coats.) Finally, remove the masking tape and newspaper.

3 Install the hinges. Then, attach the lid support (see the Buying Guide) and spacer block where shown in the photo, *page 46*, and in the Side-Section Drawing, *page 48*.

Note: Cedar slowly loses its aroma over time. Revive the fragrance by lightly sanding with 220-grit sandpaper. You can also plane a solid piece of cedar, put the shavings in a nylon or sock, and place it in the chest for use as a pomander.

BUYING GUIDE

● **Router bit.** $\frac{1}{8}$ " high-speed steel veining bit fortified with chrome-plated steel. Catalog no. 9HT2559, \$2.69. To order, call your local Sears store.

● **Counterbalanced lid support.** Rugged, heavy-gauge housing. Catalog no. D1512, \$3.35 each. The Woodworker's Store, 21801 Industrial Blvd., Rogers, MN 55374. Phone 612/428-2199 to order. ♣

Produced by: Marlen Kemmet
Project Design: James R. Downing
Photographs: Jim Kascoutas
Illustrations: Randall Foshee; Bill Zaun

DRUM-SANDING TABLE

Whether you sand curves without the fence or edge-sand with the fence, you'll find our drum-sanding table pleasurable clean and easy to use.

This dust-collecting drum-sanding table not only keeps your shop cleaner, the offset fence allows you to edge-sand stock. With the fence in place, simply feed stock slowly into the rotating sanding drum mounted in your drill press. The slight offset we designed into the fence lets you edge-sand stock to $\frac{1}{32}$ " precision. (P.S. Removable inserts make switching to different-sized sanding drums a snap.)

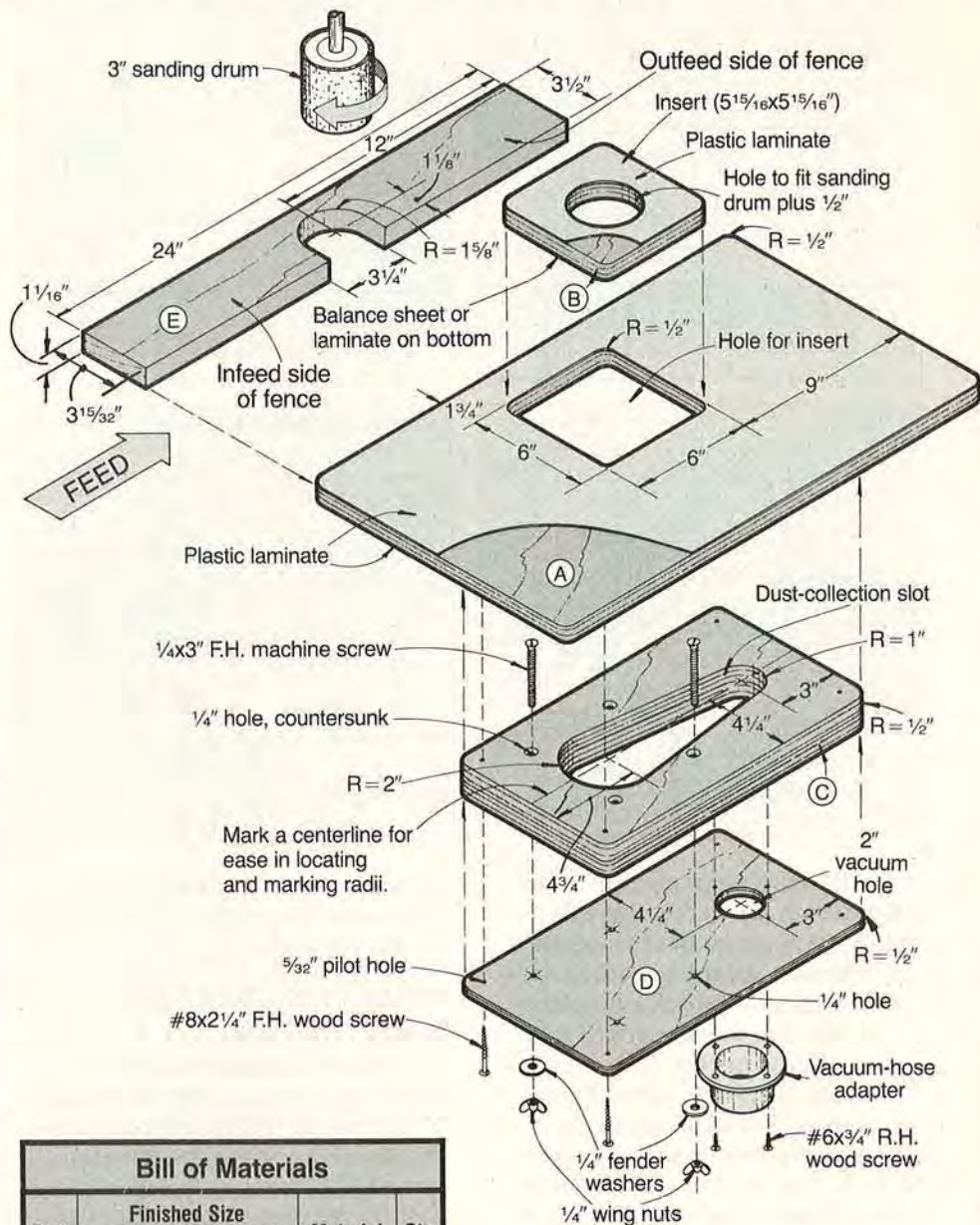
CONSTRUCTING THE SANDING TABLE

1 Cut the tabletop (A) to size as listed in the Bill of Materials. Mark the corner radii with a compass, and cut the corners to shape. Sand, but don't round-over, the tabletop edges.

2 Cut two pieces of plastic laminate to cover the top and bottom of the tabletop, allowing 1" in both directions for overlap. Apply the laminate to the top of the tabletop with contact cement. Using a router with a flush-trim bit, rout the laminate flush. Repeat this procedure with the laminate on the bottom of the tabletop.

3 Mark the location of the square insert hole on the tabletop where shown in the Exploded-View Drawing. Drill a 1" hole inside the outline in each corner, and cut the insert hole to shape with a jigsaw or scroll saw. File the sides of the hole straight if necessary.

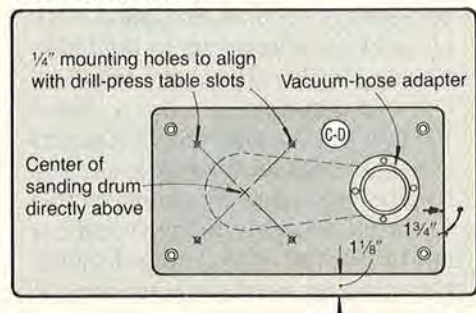
4 Cut the table inserts (B) to size. (We cut a separate insert with a hole to match each different-sized sanding drum.) Apply laminate to the top and bottom of each insert; rout any overlap flush with the



Bill of Materials					
Part	Finished Size			Material	Qty.
	T	W	L		
A	$\frac{3}{4}$ "	$14\frac{1}{2}$ "	24"	plywood	1
B	$\frac{3}{4}$ "	$5\frac{1}{16}$ "	$5\frac{1}{16}$ "	plywood	2
C	$\frac{3}{4}$ "	$8\frac{1}{2}$ "	15"	plywood	2
D	$\frac{1}{4}$ "	$8\frac{1}{2}$ "	15"	plywood	1
E	$1\frac{1}{16}$ "	$3\frac{1}{2}$ "	24"	maple	1

Supplies: #6x $\frac{3}{4}$ " roundhead wood screws, #8x $\frac{1}{4}$ " flathead wood screws, 4 — $\frac{1}{4}$ x3" flathead machine screws with fender washers and wing nuts (fender washers are wider than regular washers), plastic laminate, contact cement, polyurethane

BOTTOM VIEW





MOUNTING THE TABLE TO YOUR DRILL PRESS

NOTE: Mounting-hole locations may vary for your particular drill press. Try to position the holes inside the square cutout for easier access to the mounting screws.

- 1 Center your drill-press table under the drill-press spindle.
- 2 Set the sanding-table assembly on your drill-press table. Chuck a sanding drum in the drill press, and align the sanding table to center the sanding drum in the insert hole.

- 3 Clamp the sanding table to your drill-press table, and mark the location of the slots in the drill-press table on the bottom of D.

- 4 Remove the sanding table from the drill press. Remove the screws and separate the tabletop from the subtable and bottom panel assembly. With the subtable and bottom panel still screwed together, use a drill press and a $\frac{1}{4}$ " bit to drill four mounting-bolt holes where marked on the bottom of the panel. Flip the assembly faceup and countersink the $\frac{1}{4}$ " holes. Insert a $\frac{1}{4} \times 3$ " machine screw in each hole, and reassemble the entire table assembly.

- 5 Position the sanding table over the drill-press table. Fasten the sanding table to the drill-press table with machine screws, washers, and wing nuts.

MAKING THE FENCE AND FINAL ASSEMBLY

- 1 From $1\frac{1}{16}$ "-thick maple, cut the sanding fence (E) to $3\frac{1}{2} \times 24$ ". Mark and cut the sanding-drum hole where dimensioned in the Exploded-View Drawing. Using a table saw, rip the infeed side to $3\frac{1}{32}$ ". (For safety's sake rip only as far as the drum-sander hole, then turn the saw off, rather than trying to back the piece out with the saw running.)

- 2 Apply polyurethane to the exposed wood surfaces, and attach the vacuum-hose adapter to the table.



Above. When you want to edge-sand with precision, start by bolting the table to the drill press. Then clamp the fence into position as shown in the photo, and attach a vacuum hose to the adapter.

Left. In this photo, you can see how we removed the drum-sanding insert for a better view of the dust-collection slot beneath it. Various inserts, each with a different-sized hole, will accommodate a range of drum-sander sizes.

edges of the inserts. Sand the corners and edges so that the inserts fit snugly inside the tabletop cutout.

- 5 In the center of each insert, cut a hole $\frac{1}{2}$ " larger in diameter than the diameter of the sanding drums you plan to use.

MAKING AND ATTACHING THE SUBTABLE ASSEMBLY

- 1 Cut two pieces of $\frac{3}{4}$ " plywood to size for the subtable (C). Glue and clamp the pieces together with the edges flush. When the glue dries, cut the corners to shape and sand the edges smooth.

- 2 Mark a centerline down the length of the subtable where shown in the Exploded-View Drawing. Use the centerline and other dimensions given to lay out the shape of the dust-collection slot. Then, drill

a $\frac{3}{8}$ " hole through the subtable to start the blade, and cut the slot to shape with a jigsaw.

- 3 Cut the bottom panel (D) to size from $\frac{1}{4}$ " plywood. Mark the location of the 2" vacuum hole and cut it out with a circle cutter, or cut it to shape with a jigsaw.

- 4 With the tabletop facedown, position the subtable and the bottom panel over the hole for the inserts, and dry-clamp them in place. Drill and countersink a $\frac{5}{32}$ " pilot hole in each corner of the assembly, drilling completely through the subtable and bottom panel, and $\frac{1}{4}$ " into the tabletop. Fasten the pieces together with four $\#8 \times 2\frac{1}{4}$ " wood screws (do not use glue, as you need to be able to remove the tabletop from the subtable for ease of access when drilling the mounting screw holes later).

READERS,
IT'S YOUR
TURN!

PROJECT

An anything-but-everyday hand plane, a carving-adorned shelf, a pair of painstakingly handmade boxes, and a childhood dream come true — all once again demonstrate our readers' creativity in working with wood. See for yourself!

A FANCIFUL BALANCING ACT

Herb Mitchell, 60

Big Bear Lake, California

Architectural designer, woodcarver

"Part of carving's appeal," Herb says, "is that no two pieces ever come out the same." Yet, in order for his carved rocking horse to balance, each pair of legs had to be equal in dimension as well as equidistant across the rocker stretchers. For maximum precision, Herb cut the legs out of fir on the band saw, then rounded them off by carving.

A 3'-diameter fir log Herb dragged from the forest yielded the head and body, which he first roughed out with a chain saw. Herb attached the tail and legs to the body with dowels and glue. For strength, stability, and to prevent splitting, he made the rockers and struts by laminating oak and fir. Herb points out that soft ears have more than decorative value: They prove safer for rambunctious young riders. For contrast, Herb used three shades of Watco stain. Then he coated it with tung oil.

Young bronco busters are sure to love your horse, Herb.



DOVETAIL DELIGHTS

Jeff Overright, 29

Elkhart, Indiana

Architectural draftsman


With a friend's cabinet shop at his disposal, Jeff could have built this pair of handsome storage cases with power tools. But he chose to make them almost entirely by hand.

Jeff worked with lucky finds from his friend's scrap-wood box — some plain walnut and a piece with swirl around a knot. The size of the swirl pattern dictated the first dimension of his boxes, the tops. He could cut two 8" lengths from the figured board, and 5" widths — a pleasing proportion to the eye.

To make the dovetail joints on the corners, Jeff first marked them on the wood using a template. With an ordinary utility knife, he then "cut, chipped, and chiseled" until he convinced them to interlock snugly. Jeff rabbeted the tops and top edges of the boxes for a tight fit, and hand-rubbed tung oil for a finish.

You sure could have made the job easier, Jeff, but we doubt that your boxes could be more attractive. We hope you learned a lot from the handwork!



 Print this article

SHOWCASE



NO PLAIN PLANE

*Gregg Lehman, 24
Reseda, California
Industrial design student*

Gregg's first-semester assignment in industrial design school was to make a tool, real or imaginary. As a person who finds satisfaction in working with his hands, and as a collector of woodworking tools, Gregg decided to build a scrub plane. It fit the "real" category because a scrub plane removes wood quickly from rough lumber. But this one isn't a replica: Gregg originated the design.

From the school's scrap lumber pile, Gregg chose some stunning woods. For the stock, he selected rosewood, finger-jointed with the oak on the sole.



The handle is cherry, capped with rosewood. And the plane iron nestles between oak and walnut.

With the help of a finger-jointing jig and a miter gauge, Gregg made all the joinery cuts on a table saw. For a finish that shows off the wood yet stands up to use, he wiped on tung oil mixed with polyurethane. A lucky friend is the owner of Gregg's plane now.



AN HEIRLOOM FROM THE HOMESTEAD

*JoAnnette Sieve, 48
Parker, Colorado
Free-lance writer and commercial artist*

If her house needs a shelf or her dairy goats need a feeding trough, JoAnnette doesn't wait for her husband. For her, woodworking happens to be a homesteading skill as well as an artistic, creative craft.

JoAnnette even handles the big jobs: She and her husband built a barn and a mountain cabin — without power tools. But her real pleasure comes in pulling off her carpenter's apron, donning her thinking cap as a woodworker, and making presents for her family.

"When you're working with wood, you never know if you're creating a family heirloom," she says of the pine shelves she gave as Christmas gifts.

In first designing this shelf unit, JoAnnette thought the shelf itself would be of glass, then changed her mind. That's why the supports cradle the shelf as they do.

After cutting all the shelf pieces on a band saw, JoAnnette assembled them using simple butt joints anchored with glue and screws. To personalize each unit, she either carved a motif with a gouge, as shown, or applied a band saw cutout.

To this woodworker, finishing starts at the lumberyard with the clearest, straightest-grained pine. JoAnnette then used oak stain and satin varnish. ♣


To submit your projects...

Send a 35-mm color slide (no prints, please), with the project as the focal point and a simple background -- no people. Include a capsule description — materials, special joinery, finish, and dimensions, for example. *WOOD* will pay \$25 for published projects. Slides cannot be returned unless you enclose a self-addressed, stamped envelope.

Project Showcase
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MILL IT YOUR WAY WITH A THICKNESSING MACHINE

Need some stock milled to exact thickness for your next project? You can do it, plus a whole lot more, with a thicknesser in your shop.

 Print this article



Pictured above: Shopsmith 555082

If you're someone who thinks you can get along fine without a thicknesser — this article may just change your mind.

Sure, these workshop powerhouses, which also are known as thickness planers and simply as planers, don't come cheap. But, boy, do they work hard!

Some of these tools even have the capability of letting you joint, mold, mortise, saw, and shape stock to exact size. And if you've ever dreamed of milling rough stock into project lumber, here's the ticket.

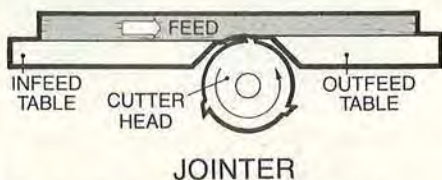
Simple thicknessers



WHY A JOINTER IS NOT A THICKNESSER

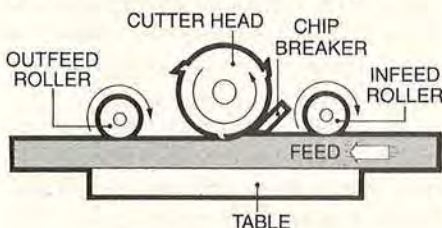
Many folks confuse these two machines because of similar appearance and operation. However, they differ in several respects.

- A **jointer** has a cutter head below the infeed and outfeed tables. At the peak of its rotation, each



blade comes exactly in line with the outfeed table. You achieve a given depth of cut by lowering the infeed table below the height of the outfeed table. The advantage of a

jointer, when properly adjusted, lies in straightening crooked lumber. You can machine rough, cupped, curved, or twisted boards to yield one perfectly even, finished side and one good edge. But to complete the job and obtain the pre-



THICKNESSER
cise, uniform thickness you want, you need a thicknessing machine.

- The first thing you notice about a **thicknesser** compared to a jointer is that the cutter head is above, rather than below, the feed tables. A thicknesser's knives exert massive uplifting force on a board as it glides between the table and the blades. It's the job of the power-feed mechanism to safely pull lumber below the cutter head, while the chip breaker prevents the knives from tearing the grain. Extreme downward pressure from the rollers presses out any cup, warp, or twist under the cutter head. The result: a finished board of exact, uniform thickness (although the distortion in shape may reappear after you remove the rollers).

THREE WAYS TO GO

The first thing we learned in our research is that the term "thicknesser" covers a lot of territory! The machines we tried out in the *WOOD Shop* fell into three basic categories: simple thicknessers, jointer-thicknessers, and molder-thicknessers. There are *lots* of thicknessing machines — too many to do justice to in one article. That's why we decided to stay under \$1,800, which should be within the means of most home woodworkers.

Thicknessers: The basic tool

Simple thicknessers reduce lumber to size and leave it with a finished surface. This category includes only a few small machines, but almost all of the commercial-size behemoths. Pictured: (1) Shopsmith 555082, also shown in opening photo; (2) Grizzly G1021; (3) the lightweight, portable "Plane Jane" Ryobi AP-10; and (4) Delta RC-33, which pioneered commercial-quality construction at moderate cost.

2-in-1 jointer-thicknessers

This convertible tool lets you salvage most of those forgotten boards that tend to twist into pretzels in the corner of the shop. With jointing capacity to match thicknessing capacity, you can eliminate cupping and twisting with one tool. Simply lift off or swing away the jointer on top assembly to use the thicknesser below. Pictured: (1) Emco Maier Rex 2000; (2) Elektra Beckum HC 260ESH; and (3) DeWalt 3590.

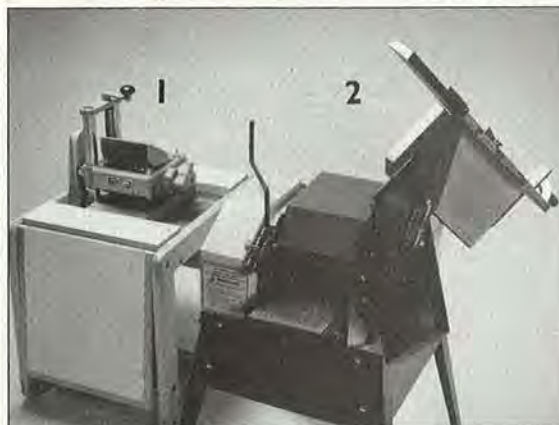
Molder-thicknessers: Fancy!

By going this route, you can thickness boards to exact dimension and make moldings of almost any pattern. Powerful 3- to 5-hp. motors are standard with the 12" versions. With such power, even full-width cuts as deep as $\frac{5}{16}$ " won't cause stalling. Pictured: (1) Williams & Hussey 7" (with our shop-made stand); (2) Foley Belsaw 8" (jointer tables up); (3) Woodmaster 12"; and (4) Foley Belsaw 12".

Jointer-thicknessers



Molder-thicknessers



Continued

THICKENING MACHINES

THE CUTTER HEAD: HEART OF THE THICKNESSER

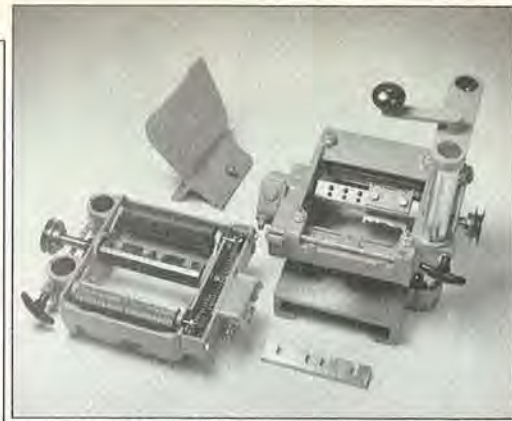
Make no mistake — power planing with a rotary-knife head can never give the smooth results of a stationary blade pushed across the same surface. Yet hand-planing takes a lot of time and skill to surpass what a power planer can deliver in just seconds or minutes.

The revolving cutter head makes hundreds of short, slightly dished scoops in a board. The number of these cuts per inch and the accuracy with which you set the blades determine how smooth the resulting surface will be.

Smaller thicknessers have either two- or three-knife cutter heads.

Two-knife heads rotate at higher speeds than three-knife heads to achieve the same number of cuts per inch, which determines how many mill marks will remain.

We found that the cut made by some of the machines we tried, even straight from the crate, was so satiny that we couldn't spot any mill marks without a magnifier. When you do find telltale mill marks, the problem probably lies in misaligned knives. It's extremely important to set the knives at exactly the same height above the cutter head and at the correct angle.



Williams & Hussey uses a steel cutter head with a blade-setting lip milled at the bottom edge for setting both thickening and molding knives. The view from the bottom (at left in photo) shows the serrated steel infeed and rubber outfeed rollers.

FEED SYSTEMS THAT KEEP STOCK MOVING

Power-feed systems on thicknessers consist of infeed and outfeed rollers mounted just in front of and behind the cutter head. Some machines, such as Makita, Hitachi, Parks, Delta, and Grizzly, have idler bed rollers mounted in slots in the thickening bed beneath the upper power rollers. These rollers reduce friction as the wood moves across the bed. Other machines require a good bed waxing from time to time.

Feed rollers are either steel or molded rubber. Which is best? Opinions vary widely. Serrated steel infeed rollers grip the wood firmly and feed it through with little

slippage, as long as you cut deep enough to eliminate the indentations. You can usually count on steel rollers to last the life of the machine with no maintenance other than cleaning.

Rubber rollers, on the other hand, leave no nicks or cuts and allow you to simply "skim" a surface because they leave no grip marks. Although we don't consider it a major problem, rubber rollers do tend to wear faster and slip more easily. A new roller costs only about \$10 and takes only 10 minutes to change on most machines.

When it comes to outfeed rollers,

the choice is either smooth steel, steel with very fine serrations or knurls, or rubber. Some machines, such as the Williams & Hussey and Shopsmith models, use rubber outfeeds with steel infeed rollers to avoid marring. Molder-thicknessers require rubber outfeeds to prevent damaging delicate cuts.

No matter what type of rollers you choose, keep them clean and the table waxed. Denatured alcohol does not damage rubber rollers and leaves no residue as it dissolves built-up wood pitch — the biggest cause of roller slippage and bed-sticking.

SPEED CONTROL: WE REALLY LIKE VARIABLE FEED

In any thicknesser, the cutter head spins in one direction and the feed rollers revolve slowly in the other. Reversing and slowing the rollers requires a gearing, belt, or chain-and-sprocket system powered from the head or a different motor.

Only two tools (Shopsmith and Woodmaster) that we know of feature variable speeds with electronic dial controls. They accomplish this by using separate gear motors that operate the power-feed system independently. With this approach, the head motor can direct all its power into moving the cutters.

Other machines with more than one speed have interchangeable belts or sprockets. All of these offer only two speeds, and, except for the Inca, they must be stopped to change speeds.

Variable-speed machines offer a key advantage: You can slow the feed to a crawl right in the middle of a pass if you hit trouble. If you've ever had a "blowout" while thickening, you know what a great feature this is! Variable feed won't prevent blowouts entirely, but it does give you added control of the situation.



Small, separate gear motors with electronic controls make the Shopsmith (shown) and Woodmaster the only machines with variable feed.

MOTORS AND CONTROLS: SAFETY FIRST!

All thicknessers use standard induction motors, except for the Japanese Makita, Ryobi, and Hitachi models (these use universal motors). And most thicknesser motors are totally enclosed fan cooled (TEFC).

Because thicknessers spew out a steady stream of fine dust, large chips, and shavings, most open motors, whether universal or induction, invite trouble. If the motor on your machine is open, blow it out frequently with an air gun.

Take special note of Ryobi's universal, high-speed motor. (It sounds like a large router when you crank it up.) Unitary design — with the motor, gear, head, and drive assembly all in one — contributes to the incredible compactness of this machine.

When it comes to controls, good placement isn't just handy, it's essential for safety. If you have to reach too low or across or around the work, you risk getting in the way of a kickback.

Controls on the Foley Belsaw, Sears, and Shopsmith models incorporate a key system that lets you lock the machine in the "off" position. Foley Belsaw also is the only company that uses safety interlocks: Open the hood while the machine is running and the motor immediately shuts down. Other machines, such as the Elektra Beckum, have magnetic starters. With these devices, the machine will not automatically start again after a power failure or after unplugging.

WHAT THEY'RE MADE OF

Cast-iron machines

Delta, Grizzly, and Williams & Hussey all have cast-iron head/power drive assemblies and bed parts with tubular steel supports that connect the bed and head assemblies. The Delta and Williams & Hussey use a stationary bed and move the head assembly up and down the tubular columns. This makes setting up auxiliary support tables a snap. But in the case of the Delta, which has the motor atop the head assembly, it's a little awkward.

Although the Grizzly 15" machine looks very much like the Delta 13", the designers of the Grizzly attached the head and motor assembly to the columns, added a fixed base, and opted to move the table up and down on the screws.

A single-side support system makes the Williams & Hussey unique. Like the Delta, it has a fixed table and movable head, with the motor either in front of or beneath the machine. This open-sided design lets you run pieces as wide

as you can support. The 7" knives can, in theory, plane a board up to 14" wide. But the best use is in the molding mode, which permits you to cut molded edges on large pieces. This machine is quite small, but the cast iron and heavy tube design makes it 80 lbs. without motor or stand.

Cast-aluminum models

Elektra Beckum and Inca provide excellent examples of the quality attainable in cast-aluminum tools. By using heavily ribbed pieces in the beds and body sides, these tools will deliver years of reliable service.

By the way, the dark-colored jointer beds on these tools stem from a chemical reaction during the anodizing process used for hardening. After repeated use, the color appears to wear off, when actually the tool is being polished by the friction of lumber passing across it.

The DeWalt and Shopsmith models combine aluminum and iron castings for lightweight durability. Both machines have cast-iron thick-

nessing tables and cast-aluminum body and base parts. The DeWalt, a jointer-thicknesser, has cast-aluminum jointer tables. The Shopsmith thicknesser, by combining both materials, makes a highly compact 12" planer with the longest thicknesser bed (28") for extra support.

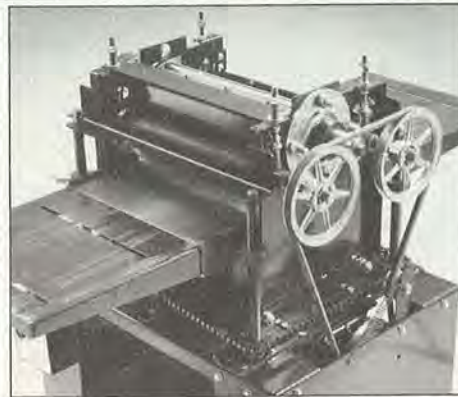
Note: Adequate support for the ends of long pieces is *essential* with these machines. Use auxiliary roller supports on all big pieces!

Sheet-steel tools

Foley Belsaw, RBI, and Woodmaster use cast-iron bed tables and sheet steel body parts. Emco and the Foley-Belsaw 8" opt for heavy-gauge sheet steel, even on the beds for thicknessing and jointing operations.

We found that all these tools ran smoothly with little vibration and accurate results. Even when we took a $\frac{5}{16}$ " bite from a 7"-wide piece of red oak on the Woodmaster at full speed, we experienced no vibration or chatter. This design allows for good quality at lower cost.

This Elektra-Beckum and other cast-aluminum tools use heavily ribbed castings to maintain perfect form, as this view inside the machine shows.



The Woodmaster 712 is typical of sheet-metal models. Note the continuous chain and threaded-rod bed adjustment.

Continued

THICKENING MACHINES

DON'T OVERLOOK THESE SPECIAL FEATURES

A) Elektra Beckum has built a family of tools — jointer/thicknesser, 12½" band saw, and spindle shaper — around its "Unimex" system.

Instead of a stationary power supply, Elektra opted for stationary tools and a lever-lock motor mount. Slip the motor and controls from machine to machine in seconds.

(You save \$225 per machine on the second and third in the set.)

B) DeWalt, Elektra Beckum, and Emco models all have mortising attachments that run off the power

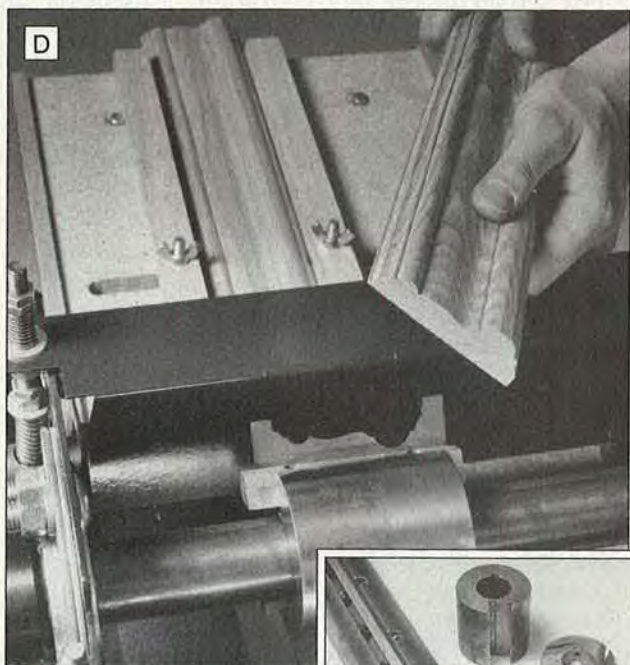
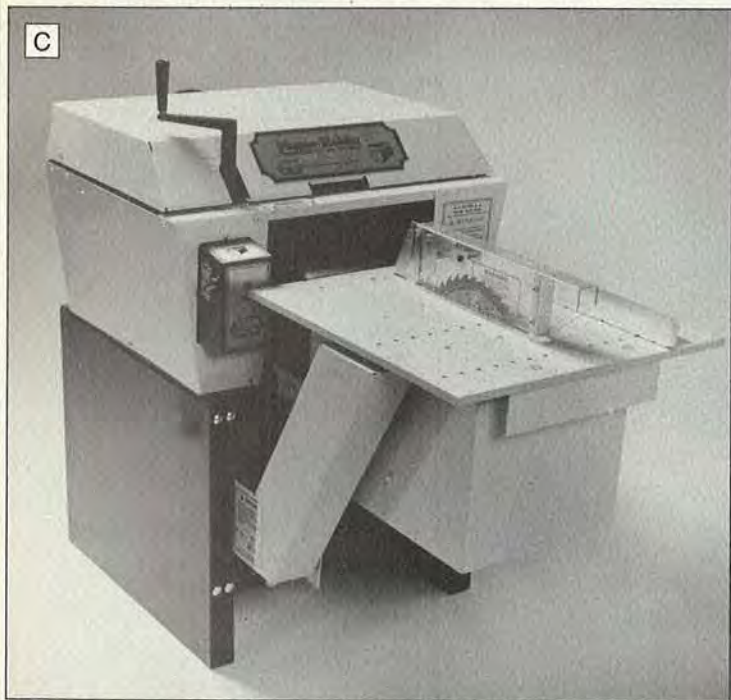
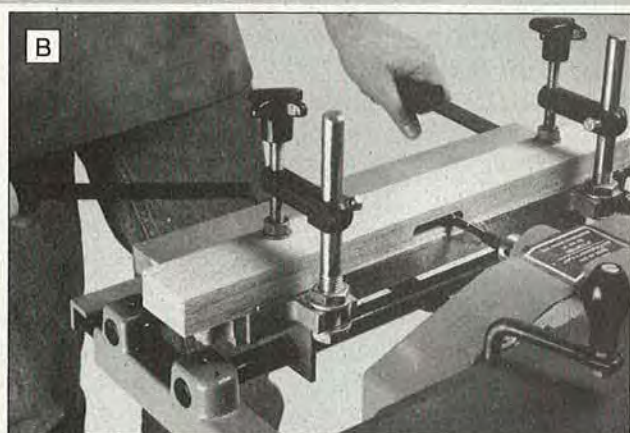
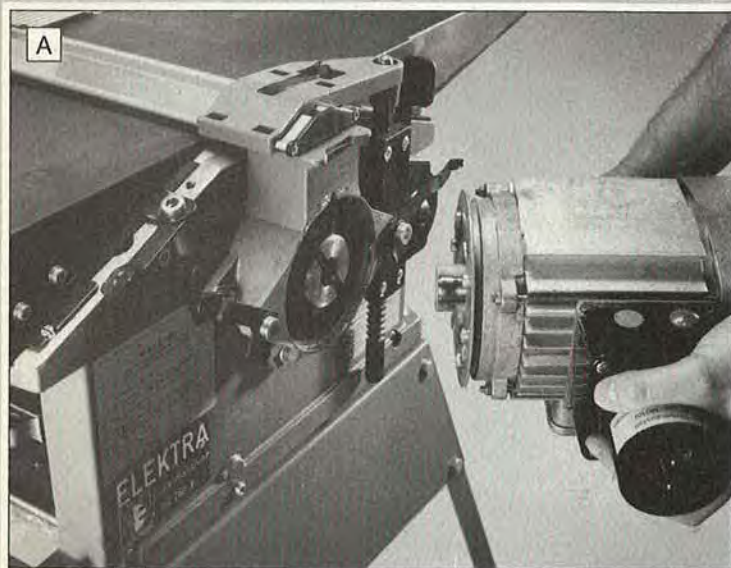
train of the thicknesser. These make some highly versatile joinery machines. The Emco offers other attachments, too, including a table saw and spindle shaper, all of which attach in just minutes.

C) The rip-saw attachment for the 12" Foley Belsaw thicknesser is unique. This device evolved naturally because the main tool complements Foley Belsaw's one-man sawmill. It's rather bulky, but you'll find the power-feed saw useful if you need to rip and plane many

narrow strips for, say, cabinet facings or butcher block.

D) We wanted to give you a close-up view of the distinctive moldings you can make after just a few minutes' adjustments on a thicknesser like this Woodmaster 712.

E) RBI and Woodmaster machines offer interchangeable heads for molding and drum-sanding. This makes setting the molding knives shown here fairly simple — you don't have to reset the planing knives when you're finished.



VITAL STATISTICS — THICKENING MACHINES

MANUFACTURER	MODEL NUMBER	POWER TRAIN					CUTTER HEAD ^{2,3}					FEED SYSTEM				ACCESSORIES ⁵		MATERIALS ⁶		WEIGHT (LBS.)	SUGGESTED PRICE					
		AMPS	VOLTS	HORSEPOWER	POWER DRIVE ¹	NO. OF SPEEDS	HEAD SPEED (RPM)	FEED RATE (FT. PER MIN.)	CUTS PER INCH	NO. OF KNIVES	GIB TYPE ¹	(U)JACKS / (S)PRINGS	INFEED ⁷	OUTFEED ⁷	MAX. CUT	THICKNESS CAPACITY (W x H - IN.)	MOLDING (Y/N)	JOINTER CAPACITY (W - IN.)	STANDARD			OPTIONAL	FRAME	THICKNESS BED	JOINTER BEDS	BASE
Delta	22-651 RC-33	12	220	2	G.B.C	1	4,500	15.5	73	3	P	S	S	S	3/16	13x5.9	N	N	B.C	A.D	T4	I	—	S	295	\$1,740
DeWalt	3590	9.5	220	2	B.C	2	6,800	29 ^{5/16}	39 ^{31.5}	2	P	J	R	R	1/8	10 1/4 x 6	N	10 1/4	B.E	A,C,F	A	I	A	A		\$1,250
Elektra Beckum	HC260ESH	13	220	2.4	G.B.C	1	7,200	19	63	2	P	J	S	S	1/8	10 1/4 x 6 3/8	N	10 1/4	A,B,D,E	F	A	A ¹¹	A ¹²	—	125	\$1,250
Elektra Beckum	HC260M	20	110	2.4	G.B.C	1	6,000	16	63	2	P	J	S	S	1/8	10 1/4 x 6 3/8	N	10 1/4	A,B,D,E	F	A	A ¹¹	A ¹²	—	124	\$1,295
Elektra Beckum	HC260K	16	220	4.2	G.B.C	1	10,200	27	63	2	P	J	S	S	1/8	10 1/4 x 6 3/8	N	10 1/4	A,B,D,E	F	A	A ¹¹	A ¹²	—	190	\$1,375
Emco Moler ¹³	Rex 2000	16.5	110	2.5	B.G.C	1	6,000	16.5	61	2	B	—	S	S	1/8	10 1/4 x 6	N	10 1/4	A,B,C,E	D,F	S	S	S	S	145	\$1,045
Foley Belsaw ⁸	985	23	220	5	B.C	2	4,500	12 ²⁰	94 ⁵⁶	3	W	J	R	R	3/16	12 3/8 x 6 1/4	Y	N	A,B	C,D,H	S	I	—	S	382	\$1,399
Foley Belsaw ⁸	684	13.6	115	1	B.C	1	6,000	28	36	2	W	J	R	R	5/32	8 x 4 1/2	Y	6 1/2	A,B,E	C,D	S	S	S	S	234	\$ 799
Grizzly ⁹	G1021	10	220	2	B.G.C	1	4,333	11.5	94	3	P	S	S	S	1/8	15x6	N	N	B,C,D,G	A	T4	I	—	I	530	\$ 795
Hitachi	P100F	15	115	2.7(max)	B.G.C	1	10,400	26	67	2	B	—	R	R	1/8	12 x 5 3/32 x 6 5/8	N	N	B.C	D	T4	I	—	I	256	\$1,605
Kity	636	10	110	1.5	B.C	2	7,400	19 ²⁴	65 ⁵¹	2	W	S	S	S	3/16	10 1/4 x 6	N	10 1/4	E	A,B,C,D	S	S	A	S	88	\$1,019 w/o mtr.
Parks	98	12	230	2	B.G	1	4,000	16	75	3	P	J	S	S	1/8	12x4	N	N	B	A,C,D	I	I	—	A	280	\$1,350
RBI	612	10	220	3	B	2	4,200	12 ³³	94 ³²	3	W	J	R	R	3/16	12 1/4 x 6 1/2	Y	7	A,B,G	C,D,E,H	S	I	S	S	289	\$1,249
RBI	408	20	115	1.5	B	1	4,200	22	50	3	W	J	R	R	5/32	8x4 25	Y	7	A,B,G	C,D,E,H	S	I	S	S	160	\$ 799
Ryobi	AP 10	13	120	2	B.C.G	1	8,000	26	51	2	B	—	R	R	1/8	10x5	N	N	B.C	—	S	A ¹¹	—	A	58	\$ 689
Shopsmith	555082	15	110	1.75	B	V	5,750	7-20	72-205	3	W	J	S	R	1/8	12x4	N	N	A,B,C	D	A	I	—	—	151	\$ 899
Williams & Hussey ¹⁰	W-7-S	15	115	1.5	B.G.C	1	7,000	15	78	2	B	—	S	R	1/4	7x8 1/4	Y	N		A,B,D	T2	I	—	—	85	\$ 740
Woodmaster	712	22	220	5	B	V	4,200	0-16	70-1,000	3	P	J	R	R	3/16	12 1/4 x 6 3/4	Y	Y	A,B,C,G	D,E,H	S	I	S	S	350	\$1,400

- 1 - (G)ear (B)elt (C)hain
- 2 - All use solid 1/8" high-speed steel knives, except Williams & Hussey, which uses 1/4" knives through-bolted to head
- 3 - Elektra Beckum offers optional two-edged disposable knives.
- 4 - (W)edge (P)inch (B)olt-through

- 5 - (A) Stand (B) Motor (C) Knife-setting gauge (D) Dust-collection hood (E) Jointer system (F) Mortising system (G) Extension tables (H) Surface sanding

- 6 - (S)heet steel (A)luminum Alloy Cast (I)ron Cast (T2)ubular steel — 2 posts (T4)ubular steel — 4 posts
- 7 - (R)ubber (S)teel
- 8 - Sears specifications same as Foley Belsaw.

- 9 - Total Shop, Sunhill and Wilke offer a similar machine.
- 10 - W & H offers the W-7 as (1) Hand feed W-7 - \$470 (2) Power Infeed W 7-PF - \$645 (3) Power infeed and outfeed W7-S - \$740

- 11 - Laminated with stainless-steel sheet.
- 12 - Anodized
- 13 - Table saw mortising 30mm shaper attachments

DUST COLLECTION: THE PICTURES TELL THE STORY



All thickening machines, big and small, put out lots of shavings and fine dust — more than any other shop tool except large sanders. You can try a shop vac to solve the problem, but most of these machines fill quickly and clog easily when put to this use unless there's a lot of suction.

We had super results with the Elektra-Beckum dust-extraction system pictured here before and after hookup. It uses a dustbag filter and plastic bag (some manufacturers use drums or second sets of canvas bags) connected to a large, cast, impeller-style fan. The minimum-4" hoses you find on these devices move an amazing quantity of dust and debris.

At \$350 and up, we think a dust collector makes sense — you'll reduce the health risks of breathing all that stuff, and your shop and home will stay much cleaner. 🌿

Produced with George Granseth
Photographs: Hopkins Associates;
Jim Kascoutas



A Little Bit Country

 Print this article

Mallard Mug Rack

Add an air of country charm to your kitchen with this outdoorsy pine mug rack. Or, hang it in your entry area for a quaint coatrack.

MACHINING THE PARTS

1 Rip and crosscut the back piece (A), shelf (B), and the shelf supports (C) to the sizes listed in the Bill of Materials. Cut the duck blank (D) to 4x8".

2 Use a compass to mark the corner radii on the back piece and shelf. Then, lay out and mark the shelf location, shelf mounting holes, peg holes, and the holes for mounting the rack to the wall on the back piece where indicated in the Exploded-View Drawing.

3 Drill the holes for attaching the rack to the wall and the holes for attaching the shelf to the rack where shown in the drawing.

4 Cut the radiused corners on the back and shelf to shape and sand the edges smooth. Fit your router with a 1/4" round-over bit. Rout the front edge of the back piece and all the edges of the shelf *except* for the edge that you will attach to the back piece later.

5 Using carbon paper, transfer the full-sized patterns on page 84 for the shelf supports (C) and the duck (D) onto the pine stock. (Don't forget to transfer the painted

areas of the duck and the location of the dowel holes.) Drill a pair of 1/4" holes 13/16" deep in the bottom of the duck blank. (We used a doweling jig to center the holes.)

6 Insert 1/4" dowel centers in the holes in the duck blank. Center the duck on the back piece, and transfer the location of the holes to the top edge of the back piece. Using a doweling jig, drill two 1/4" holes 13/16" deep in the top of the back piece where marked with the dowel centers. Cut two pieces of 1/4" dowel 1 1/2" long. Glue the dowels in the holes in the duck. Do *not* mount the duck to the rack yet.

7 Cut the supports and the duck to shape with a scroll, band, or jig-saw. Sand all contours smooth, and sand or rout a 1/4" round-over on the front edge of the duck.

8 Cut four pieces of 1/2" dowel to 2 1/4" for the pegs. Sand a slight chamfer on one end of each dowel.

DRILLING THE PEG HOLES AND ASSEMBLING THE MUG RACK

1 To make the drilling guide shown in the photo, *right*, cut a piece of the 1 1/16" pine to 1 3/8" wide



by 6" long. Drill a 1/2" hole 2 1/4" deep into one end of the piece (we used a doweling jig to drill as straight as possible). Now, miter-cut the drilled end at 20°, 2" from the end, where shown in the Drilling-Guide Drawing, *opposite page*.

Now, mark a line across the center of the hole and down the shortest edge of the drilling guide, where shown in the photo and drawing.

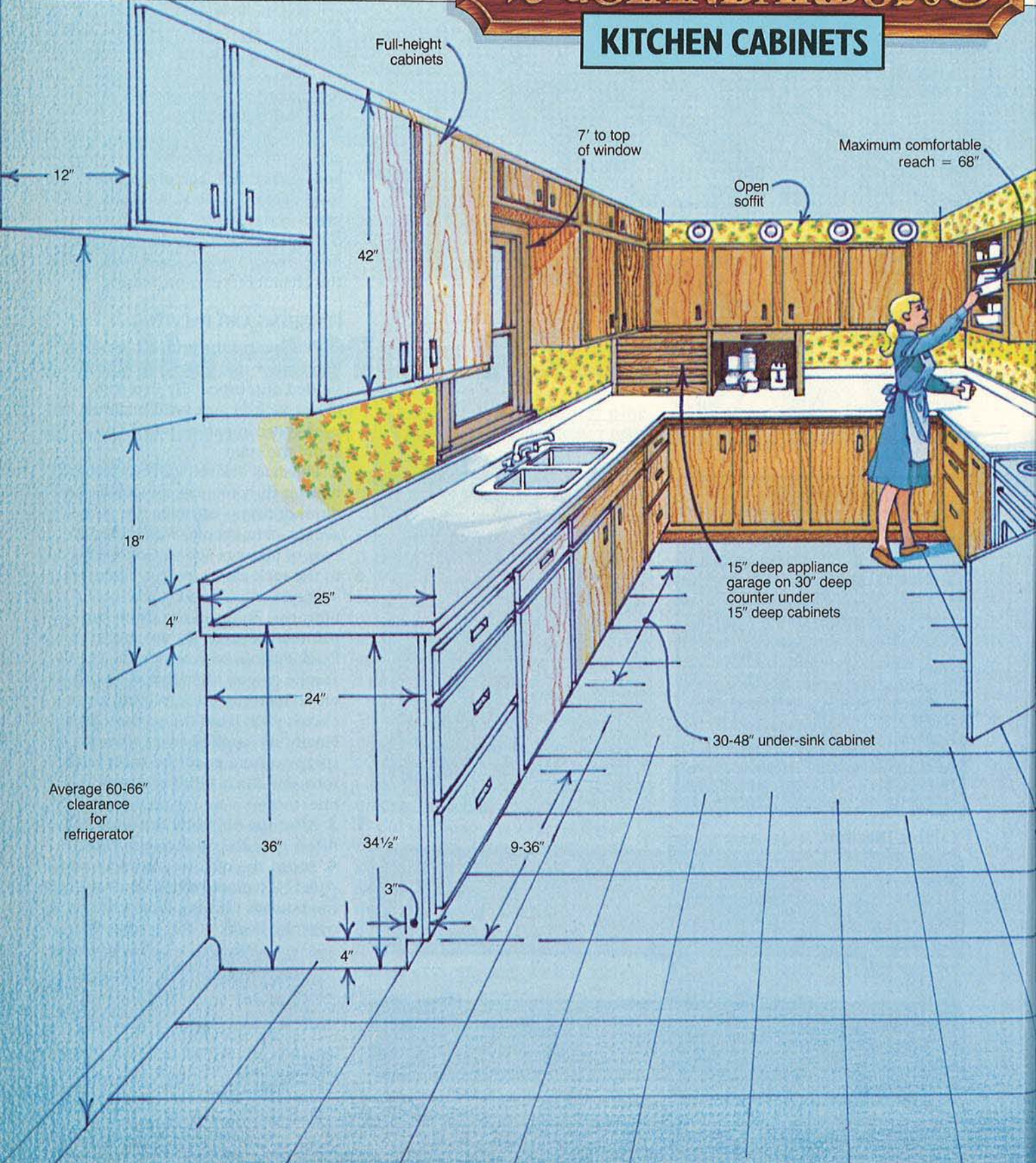
2 Clamp a strip of wood to the bottom of the back piece to act as a fence as shown in the photo. Wind tape on your drill bit 2 3/8" back from the tip to act as a depth stop. Next, position the drilling guide



Previous articles in this series include: "Seating" and "Tables", Feb., 1986, pp. 54-56, 61-63; and "Screws", June, 1986, pp. 46-49.

WOODWORKERS' STANDARDS

KITCHEN CABINETS



Full-height cabinets

7' to top of window

Maximum comfortable reach = 68"

Open soffit

12"

42"

18"

4"

25"

15" deep appliance garage on 30" deep counter under 15" deep cabinets

24"

30-48" under-sink cabinet

Average 60-66" clearance for refrigerator

36"

34 1/2"

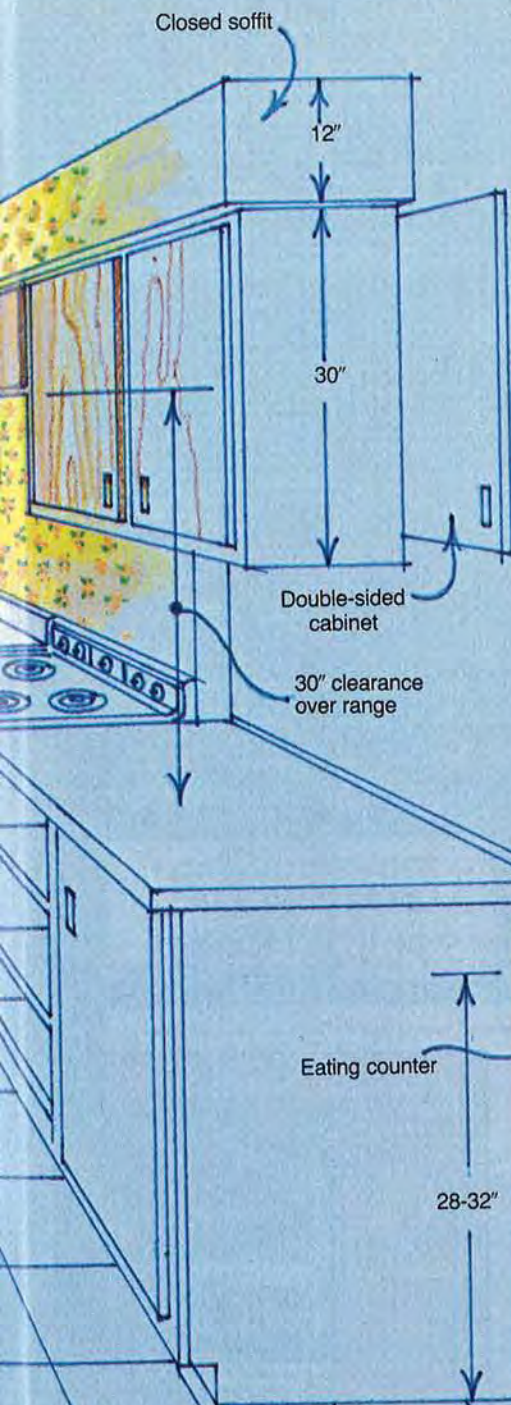
9-36"

3"

4"

Cabinets come in many sizes and configurations — with good reason. How far you can reach comfortably, the space required for

chores, and the height and width of appliances all govern cabinet measurements. Here are the dimensions you need to do the job.



Why are countertops almost always 36" from the floor? Because that's long been considered the most comfortable worktop height for a woman, and, at least so far, kitchens have been designed primarily for use by women.

Research indicates that most women have a comfortable overhead reach of 68", the height at which you'll find the highest regularly used shelf in a wall-hung cabinet. That's also why the more frequently used upper drawers in a base cabinet are about 28" from the floor — so they can be opened without stooping.

How far the average woman can stretch her arms straight out in front of her is called "reach radius," and that determines not only the 25" standard depth of a countertop, but the depths of cabinets, too. Reach radius, plus the amount of space needed for cooking, baking, and cleanup, also decides the clearance between wall cabinets and countertops, over ranges, and space needed around ovens, sinks, and dishwashers.

STANDARD MEASUREMENTS AND SPECIAL REQUIREMENTS

In the drawing of the composite kitchen, *left*, you'll see how these and other standard measurements come into play in a room with the usual 8' ceiling. Except for the range, we omitted the appliances

This kitchen has many more cabinets of different dimensions than you'd find in any one kitchen. That's so you can see how different-sized cabinets can efficiently fill space. At left, full-height cabinets add storage space. At one end of the kitchen, you'll see extra-deep cabinets and counter. On the right, "standard" height cabinets are used with a closed soffit.

you'd normally find in a modern kitchen for the sake of clarity (see appliance dimensions, *page 67*).

We've also indicated three common ways to treat soffits: (1) closed, to conceal the tops of wall cabinets; (2) open, for possible display space above cabinets; and (3) filled with full-height cabinets for additional storage.

Sometimes, standard cabinet dimensions must adapt to special circumstances. In a kitchen designed for the elderly, for example, you'd want to lower the highest functional shelf 3", raise the lowest shelf or drawer 3", and provide a work surface about 1½" lower than standard.

For the physically disabled person who must cook from a wheelchair, countertops should only be 31" from the floor. To accommodate the chair under the counter during meal preparation, you have to provide a free space 30" wide by 29½" high. This allows a full 24" of forward reach on top of the counter.

Kitchens — and cabinets — also should be tailored to how your family cooks, and the space you have to work with. If you favor lots of fresh-baked breads and pastries, think about a special area with a 30" deep countertop for rolling dough. Lots of small, labor-saving appliances, such as food processors, might require their own storage area that you'll have to custom-dimension.

If you're starting from scratch with an empty room, use this rule of thumb to calculate the number of cabinets you'll need: Basic storage requires 9' of base and wall cabinets, *plus 3'* of cabinets for each member of the family regularly eating at home. A family of four requires 21 running feet of both wall and base units.

Continued

WALL CABINETS: SIZED FOR VERSATILITY

Wall cabinets normally mount directly on the wall, but they can also hang from the ceiling over an island or peninsula with access from both sides. No matter how you use them, wall cabinets should be 12" deep when installed over a 25"-deep countertop, and 15" deep over a 30" countertop.

How high you make wall cabinets depends on how much storage you need. With a closed or open soffit, the standard wall cabinet height is 30", providing two shelves for three compartments within. If you want to use soffit space for storage, install 42" full-height cabinets. The differ-

ent cabinet heights you'd use in open, closed, or full-height situations appear below in the cabinet illustrations.

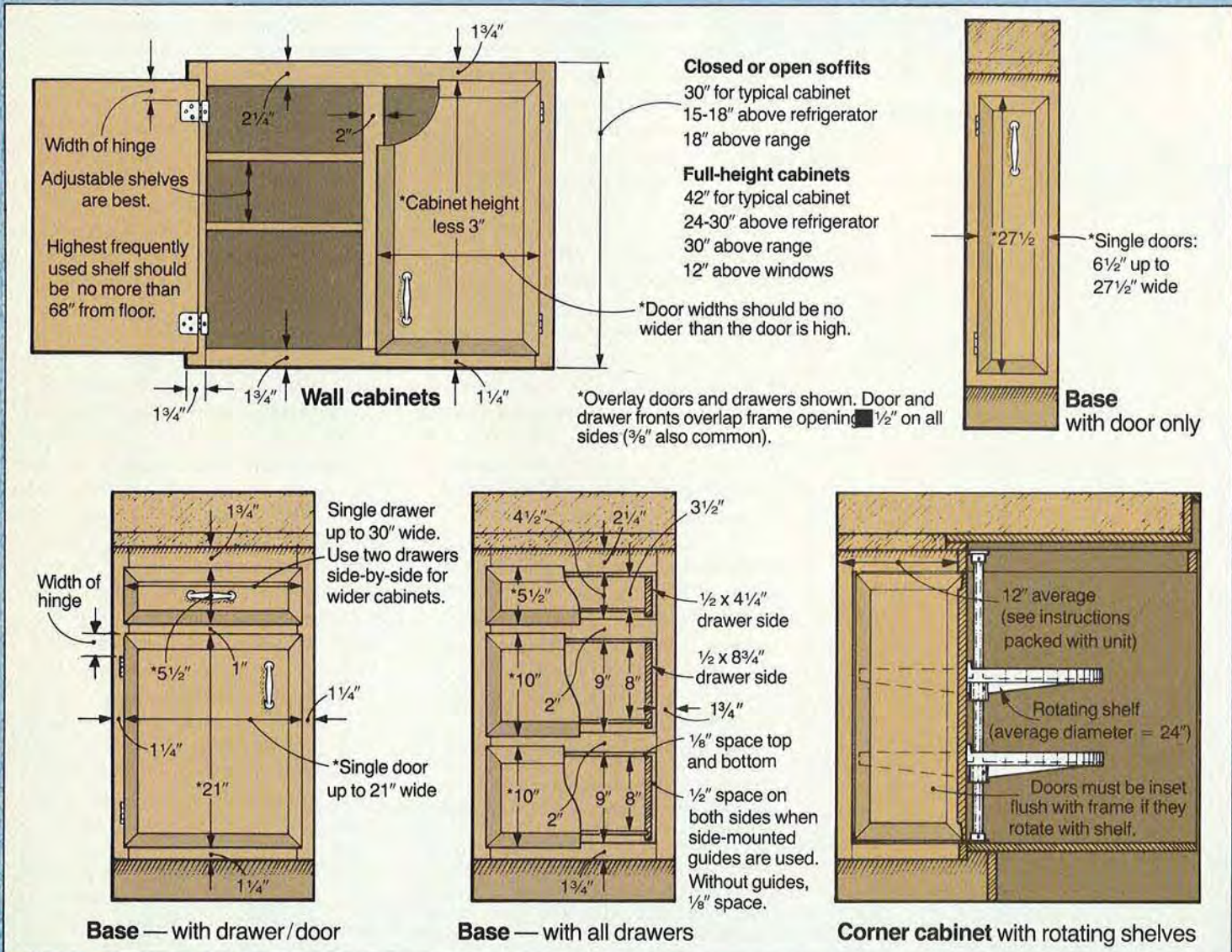
The width of wall cabinets, usually from 9"-36", is determined by the width of the matching base cabinets immediately below, since in most cases, the units are viewed as a pair. Whether a wall cabinet has one door or two, however, depends on its width. Doors wider than their height tend to sag because of the weight on the hinges, so wide cabinets have two doors.

Detailed dimensions of a wall cabinet are shown in the illustration, *below*. Use them for reference when you detail your kitchen-cabinet project plans.

BASE CABINETS: DIVIDING UP STORAGE SPACE

You may want a special narrow cabinet of 9" to hold cookie sheets and trays next to the stove, or an under-sink cabinet 42" wide. However, base cabinets normally measure about 24" deep and 34½" high (adding a 1½" countertop brings them up to 36"). Extra-deep base cabinets of 29" maximize countertop area for tasks such as baking, or storage for small appliances (you also can set standard-depth cabinets away from the wall and cover them with a 30" countertop). Toe kicks are 3" deep by 4" high.

Divide up the space in a base cabinet with all shelves and a door or doors, all drawers, or a combina-



tion of drawer and doors, as in the typical configurations shown on the opposite page. As with wall cabinets, the width of the cabinet determines whether you should use one drawer or door, or two.

ALLOWING FOR SIZE AND USE OF APPLIANCES

Your kitchen appliances also affect the dimensions of many of your cabinets, as well as countertop area. Luckily, appliance manufacturers heed standards, too. That's why a built-in dishwasher fits snugly under a countertop and a drop-in range scoots in with room to spare.

In the box, below, you'll find a complete chart of appliance dimensions, as well as those for single-, double-, and triple-bowl sinks. Use these as a planning guide for coun-

tertop cutouts and spacing between base cabinets, but *always refer to the specific sink or appliance model you'll use for exact installation instructions.*

Besides dimensions, you'll have to allow countertop workspace to use your appliances, as well as the sink. While your space may require adjusting these ideal situations, here are some considerations:

- Ranges, including built-in or countertop microwaves, should have about 18" of work area on either side; ovens, about 15" on one side.
- To load or unload a refrigerator, allow approximately 18" of counter on the door-opening side.
- Try to provide space on both sides of the sink for cleanup — 30" to the right and 24" to the left.

SHELVING, SPECIAL CABINETS, AND EATING COUNTERS

If possible, make all cabinet shelving adjustable with shelf supports or a pin system. That way, you can vary heights and spacing to meet your changing needs.

Specialized cabinets add convenience or utilize normally wasted space, such as the lazy susan corner shown on the facing page. You can purchase its rotating shelves as a unit to install in your hand-crafted cabinet.

Other specialty cabinets include those to house microwaves and separate conventional ovens, pantries and broom closets, and units used for desks and cookbook storage. Cabinets of this type have to be customized to your space.

Eating counters range from the informal high bar to casual family seating at table height. Bar-height counters measure 42"-45" from the floor and require about 7"-9" knee space with a 30" bar stool that has a footrest. You can also build one to match your 36"-high countertop by providing a 10" knee space and using 24"-high stools. Table-height counters are 28"-32" from the floor, and require 18" of knee room and chairs 18" high.

How long should your counter be? Allow 21" of length for each person served. A 15" depth provides space for a place setting. Two diners facing each other at a table or booth need a minimum of 30" combined.

For more information about planning and building kitchen cabinets, refer to the following:

- "Basic Cabinet Construction," *WOOD Magazine*, Feb., 1985, p. 59.
- Better Homes and Gardens® *Step-by-Step Cabinets & Shelves*, Meredith, 1983, \$6.95.
- Better Homes and Gardens® *Your Kitchen*, Meredith, 1983, \$9.95.
- *Building Your Own Kitchen Cabinets* by Jere Cary, The Taunton Press, 1983, \$12.95. ●

Produced by Peter J. Stephano and James R. Downing
Illustrations: Kim Downing; Jim Stevenson

APPLIANCE AND SINK DIMENSIONS


Unless you buy commercial or European units, almost all appliances fall within the following range of dimensions. Refer to them when planning your cabinets, but get actual measurements before you build.

APPLIANCE	HEIGHT	WIDTH	DEPTH
Range, floor model	35 $\frac{1}{8}$ -36"	19 $\frac{1}{2}$ -40"	24 $\frac{1}{2}$ -26 $\frac{1}{4}$ "
Range, w/eye-level oven	61 $\frac{1}{2}$ -67 $\frac{7}{16}$ "	29 $\frac{7}{8}$ -40"	25 $\frac{1}{2}$ -27 $\frac{5}{8}$ "
Range, drop-in	23-23 $\frac{1}{2}$ "	22 $\frac{7}{8}$ -23 $\frac{7}{8}$ "	22 $\frac{1}{8}$ -25"
Cooktop	2-3"	12-48"	18-22"
Wall oven, single	23 $\frac{1}{2}$ -25"	21-24"	21 $\frac{1}{8}$ -22 $\frac{11}{16}$ "
Wall oven, double	39 $\frac{1}{4}$ -50 $\frac{3}{8}$ "	21-24"	21 $\frac{1}{8}$ -22 $\frac{11}{16}$ "
Wall oven w/broiler	38-40 $\frac{3}{16}$ "	21-24"	21 $\frac{1}{8}$ -22 $\frac{11}{16}$ "
Range hood	5 $\frac{1}{2}$ -7 $\frac{1}{2}$ "	24-72"	12-27 $\frac{1}{2}$ "
Microwave	13 $\frac{5}{8}$ -18"	21 $\frac{1}{2}$ -22 $\frac{1}{2}$ "	14 $\frac{1}{2}$ -22"
Refrigerator	55 $\frac{1}{2}$ -68 $\frac{7}{8}$ "	24-35 $\frac{1}{2}$ "	26 $\frac{9}{16}$ -32 $\frac{7}{8}$ "
Dishwasher	33 $\frac{1}{2}$ -34 $\frac{1}{2}$ "	23-24 $\frac{1}{4}$ "	23 $\frac{11}{16}$ -26 $\frac{1}{4}$ "
Trash compactor	33 $\frac{1}{2}$ -34 $\frac{1}{2}$ "	11 $\frac{7}{8}$ -14 $\frac{7}{8}$ "	18-24 $\frac{3}{16}$ "

SINK	LENGTH	WIDTH
Single bowl	11 $\frac{1}{2}$ -33"	13-22 $\frac{3}{8}$ "
Double bowl	28-46"	16-25"
Triple bowl	43-54"	22"

A Gem of a Gift! 24-Karat Jewelry Case



 Print this article



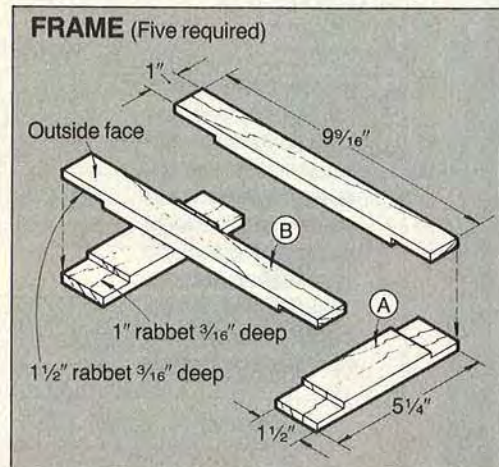
Any woman appreciates having a special place to keep her small jewelry pieces neatly organized — especially when the unit looks as exquisite as its contents. Routed drawer pulls and handles of bird's-eye maple help put this walnut jewelry case in a class by itself.

MAKING THE FRAMES

Note: You'll need some thin stock for this project. You can resaw your own or order it. See the *Buying Guide* on page 71 for our source.

1 Cut all the rails (A) and stiles (B) for the divider, sides frames, and for the doors to the sizes listed in the Bill of Materials.

2 Mark the half-lap joints on the rails and stiles where shown on the drawing, *below*. Then, use a dado blade on your table or radial-arm saw to test-cut the joints. Adjust if necessary, and cut the half laps.



The display carousel on the left side of the jewelry case, *above*, keeps hanging necklaces within easy reach and tangle-free.

3 Glue and clamp the rails and stiles into five frames (two for the doors, two for the sides, and one for the divider), checking for square.

4 Rip the two side frames and the divider to $4\frac{7}{8}$ ". Then, rip the opposite stile of the divider for a $4\frac{3}{4}$ " finished width. Finally, cut a notch for the magnet in the divider, and sand the frames smooth.

5 Rout $\frac{1}{4}$ " rabbets $\frac{1}{4}$ " deep in the openings in the back face of the two side frames, the divider, and the two doors (see the Buying Guide for information on the bit we used). Square the corners with a chisel. Rout a $\frac{1}{4}$ " rabbet $\frac{1}{8}$ " deep along the back edges of the side frames.

6 Take the frames to a glass dealer and have him cut the mirror for the divider and the glass for the left side and doors. (We had our pieces

cut $\frac{1}{16}$ " less in both length and width to allow for contraction of the wood frames.) Also, have him cut the $4\frac{1}{2} \times 9$ " mirror panel for the necklace compartment.

MACHINING THE CASE TOP AND BASE

Note: The parts for the top and base are cut extra wide so that you can rip the front strips (D, F) from them. This simplifies cutting the stopped dadoes and rabbets.

1 From $\frac{3}{4}$ " walnut, cut two pieces to $6 \times 11\frac{1}{8}$ " for the top (C, D) and the base (E, F).

2 Rip a $\frac{3}{4}$ "-wide strip from the front edge of the top to form part D. Then, rip a $\frac{3}{8}$ " strip from the front edge of the base to form part F. Finally, rip the top (C) and the base (E) to finished width ($4\frac{7}{8}$ ").

3 Cut $\frac{3}{8}$ " dadoes $\frac{1}{4}$ " deep in the top and base where dimensioned in the Exploded-View, page 70, and Top and Carousel Drawings. Next, cut the $\frac{3}{8}$ " rabbets $\frac{1}{4}$ " deep on each end of the base.

4 Rout a $\frac{1}{8}$ " rabbet $\frac{1}{4}$ " deep along the back edge of the base (see the Exploded-View Drawing). Rout a stopped rabbet the same size in the top where shown in the Top and Carousel Drawing, below left. (We clamped stops to our router table fence to ensure that we stopped the rabbet at the right points when rabbeting the top.)

5 Glue part D to C, making certain that the ends of the two parts are flush. Then, glue part F to E. Later, sand all surfaces flush.

CUTTING THE TOP AND BASE MOLDINGS

1 Start by cutting a strip of $\frac{3}{4}$ " walnut to $1\frac{3}{4} \times 24$ " for the base molding. (You'll cut parts G and H to length from this strip later.)

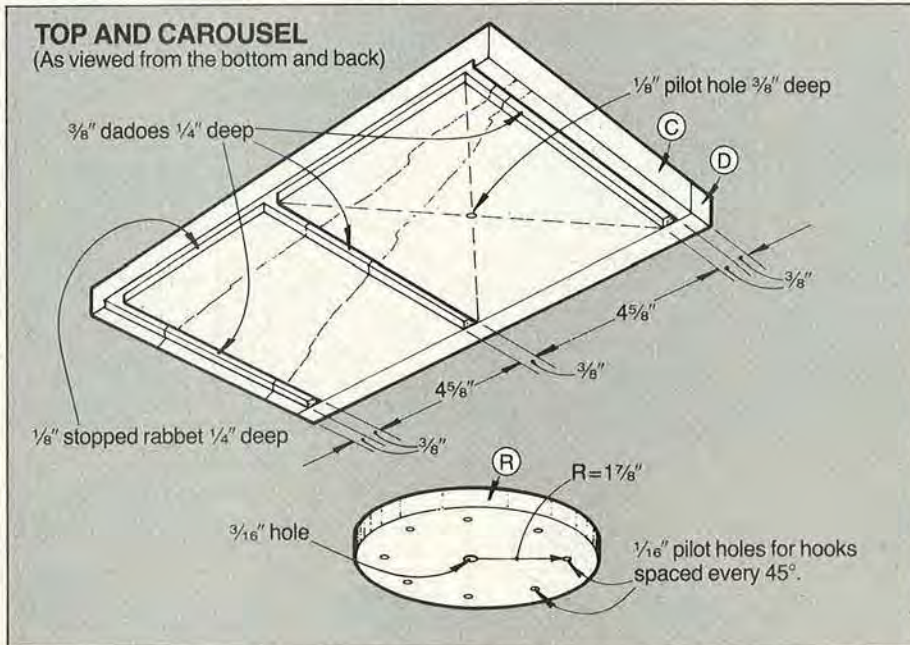
2 Rout the top (C, D) following steps 1, 2, and 3 in Shaping the Top Molding Drawing. To form the molding for the bottom (G, H), follow steps 1 and 2 *only*.

3 Finally, cut a $\frac{3}{4}$ " rabbet $\frac{3}{8}$ " deep along the base molding to house the base (E, F). Set the molding strip aside for now.

COMPLETING THE CASE

1 Refer to the Top and Carousel Drawing and locate the mounting hole for the carousel (R) by drawing diagonals on the bottom of the left-hand side of the top (C, D).

Continued



SHAPING THE TOP MOLDING

Step 1

Router fence

$\frac{5}{16}$ "

$\frac{3}{4}$ " core box bit

$\frac{5}{16}$ "

Step 2

Router fence

$\frac{3}{8}$ "

Rabbeting bit

$\frac{1}{16}$ "

Step 3

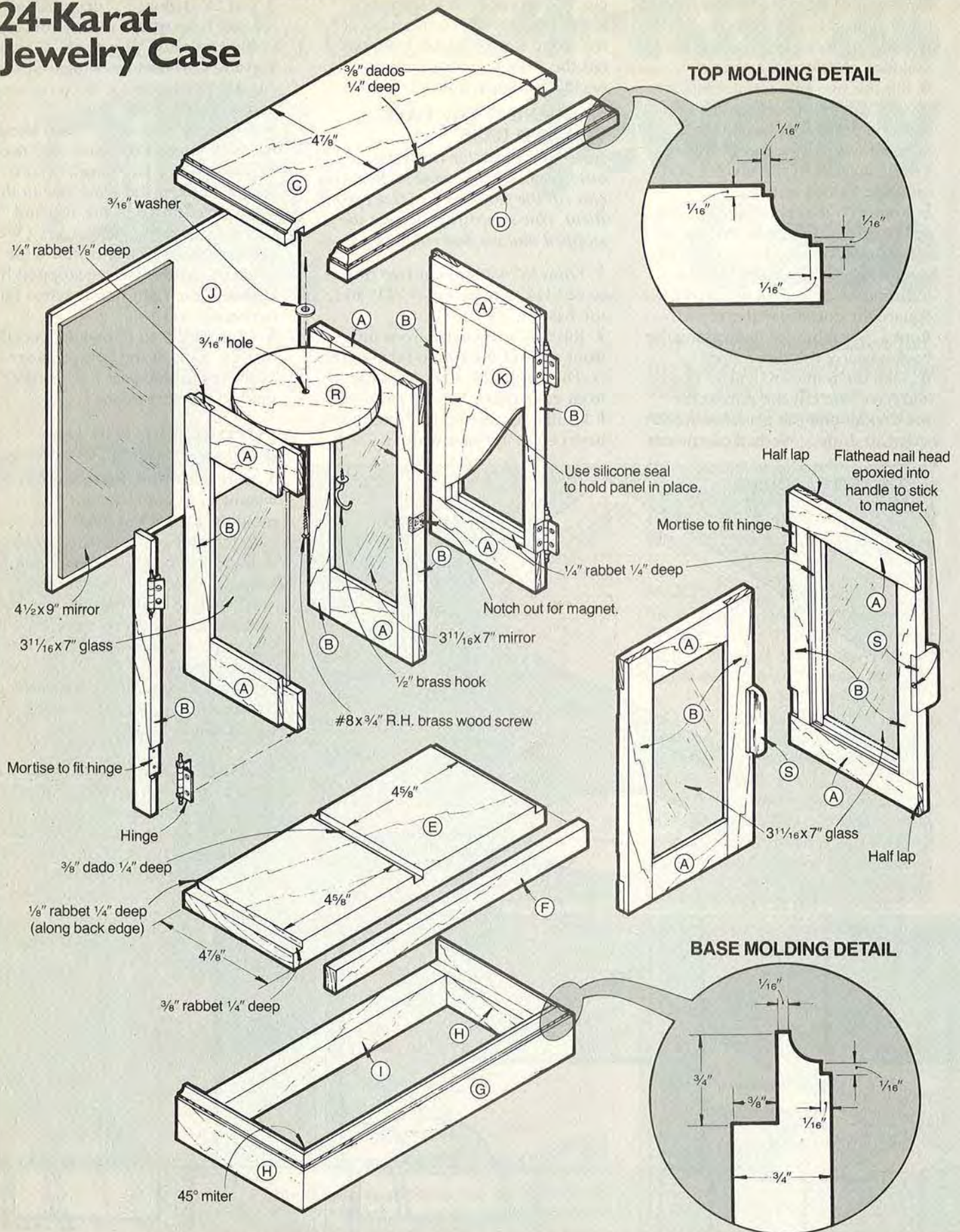
Router fence

$\frac{3}{8}$ "

Rabbeting bit

$\frac{1}{16}$ "

24-Karat Jewelry Case



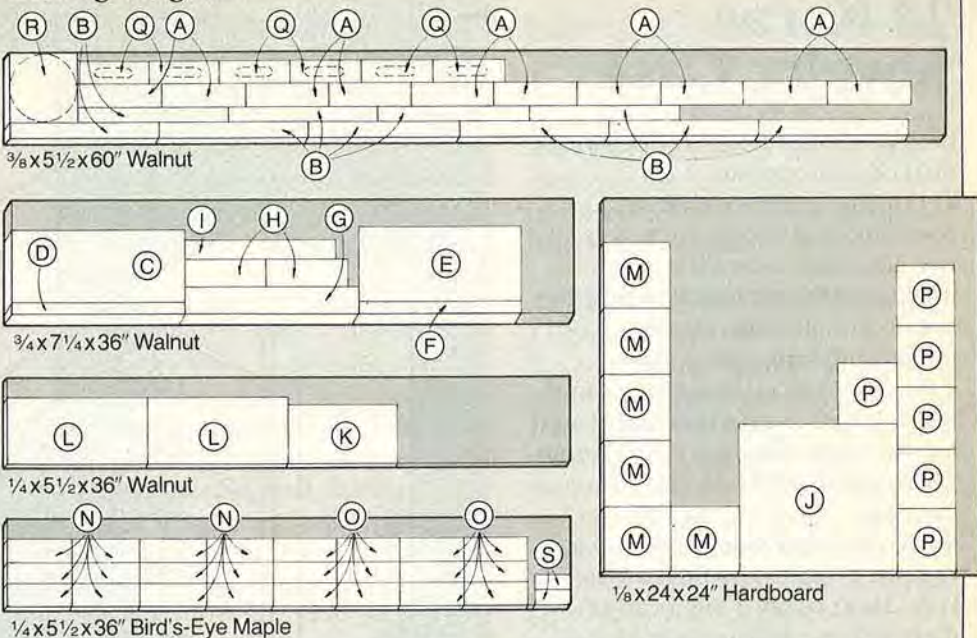
Bill of Materials

Part	Finished Size*			Material	Qty.
	T	W	L		
A	3/8"	1 1/2"	5 1/4"	walnut	10
B	3/8"	1"	9 9/16"	walnut	10
C*	3/4"	4 7/8"	11 1/8"	walnut	1
D	3/4"	3/4"	11 1/8"	walnut	1
E*	3/4"	4 7/8"	10 3/8"	walnut	1
F	3/4"	3/8"	10 3/8"	walnut	1
G*	3/4"	1 3/4"	11 1/8"	walnut	1
H*	3/4"	1 3/4"	5 5/8"	walnut	2
I	3/4"	1"	9 9/16"	walnut	1
J	1/8"	9 9/16"	10 1/8"	hardboard	1
K	1/4"	3 1/16"	7"	walnut	1
L	1/4"	4 1/4"	9"	walnut	2
M	1/8"	4 1/4"	4 3/8"	hardboard	6
N	1/4"	1 5/16"	4 1/4"	bird's-eye maple	12
O	1/4"	1 5/16"	3 1/16"	bird's-eye maple	12
P	1/8"	3 1/16"	4"	hardboard	6
Q	3/8"	1 7/16"	4 1/2"	walnut	6
R	3/8"	4 3/8" diam.		walnut	1
S	1/4"	7/8"	2 1/4"	bird's-eye maple	2

*Parts marked with a * are cut larger initially, then trimmed to finish size. Please read the instructions before cutting.

Supplies: #8x3/4" roundhead brass wood screws, 3/16" flat washers, 8 — 1/2" brass cup hooks, double-faced tape, magnet from a refrigerator note holder, 2 — 1x17 nails, epoxy, clear silicone sealant, 1/8" glass, 1/8" mirror, finish

Cutting Diagram



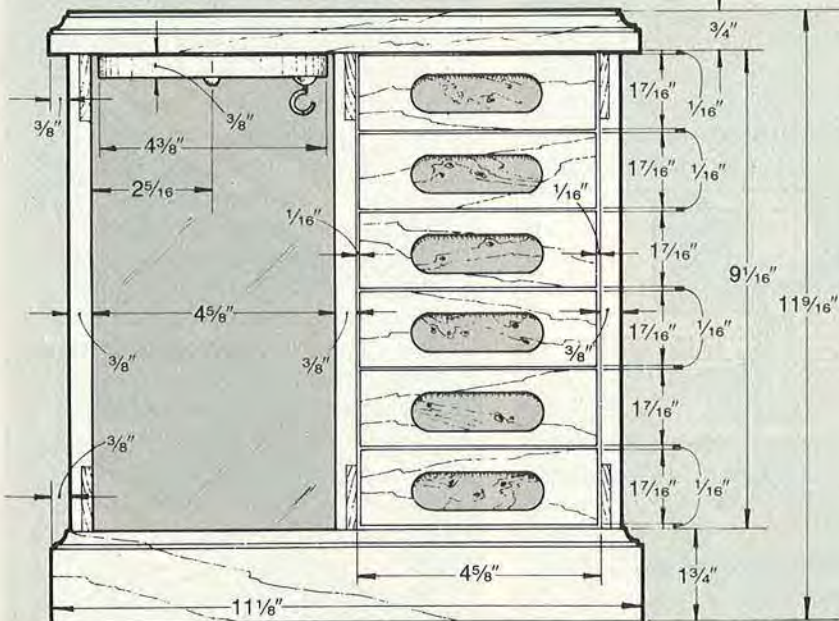
BUYING GUIDE

- **Hinges.** Two pairs, ball-tipped, 1 1/4x1 3/16". Catalog no. H2200, \$2.10 per pair. Craftsman Wood Service, Dept W, 1735 W. Cortland Ct., Addison, IL 60101. Phone: 312/629-3100.
- **Thin stock.** 3/8" walnut. Catalog no. W9725, \$3.98 per square foot. 1/4" bird's-eye maple. Catalog no. W9112, \$3.95 per square foot. Craftsman Wood Service (address above).
- **Router accessories.** *Rabbet bit:* catalog no. 9HT25581, \$6.49. *Arbor set:*

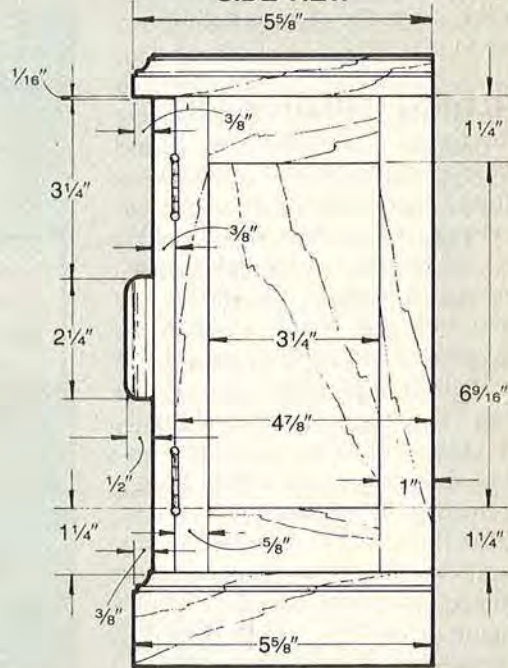
catalog no. 9HT25601, \$4.69. To order, call your local Sears store. You will need a 1/4" straight bit, 1/4" round-over bit, 3/8" core box bit, 3/8" cove bit, and 1/2" straight bit.

- **3/8" guide bushing.** Check with your local dealer for a template to fit your make of router. If not available, order a Router Guide Bushing Set, which includes a universal base-plate and four guide bushings. Catalog no. 11V12-VA, \$9.95. Woodcraft, 41 Atlantic Ave., P.O. Box 4000, Woburn, MA 01888. Or call 800/225-1153.

FRONT VIEW
(Shown without doors)



SIDE VIEW



Continued

24-Karat Jewelry Case

Drill a $\frac{1}{8}$ " pilot hole $\frac{3}{8}$ " deep at the marked center point.

2 Cut the hardboard back (J) to size. Glue and clamp the top, base, two side frames, and the divider together. Place the back in position, but do not glue it in place yet — it helps hold the case square.

3 Miter-cut the strip of base molding to length for parts G and H, and cut the back stretcher (I) to length. Then, glue parts G, H, and I to the case.

4 Cut the right-side panel (K) to the size listed in the Bill of Materials. Then, apply a fine bead of clear silicone sealant to hold the panel to the frame (silicone sealant allows for expansion and contraction of the frame).

5 Using silicone sealant, attach the mirror to the divider.

6 Cut the drawer-support uprights (L) to size. Then, cut $\frac{1}{8}$ "-wide dados and a rabbet exactly where dimensioned in the drawing, *right*.

7 Glue and clamp the uprights in the case (make sure they're flush with the back of the divider and side frame). Measure the length of the six drawer supports (M) so that they fit snugly in the uprights. Cut the inserts to size, and glue them in place.

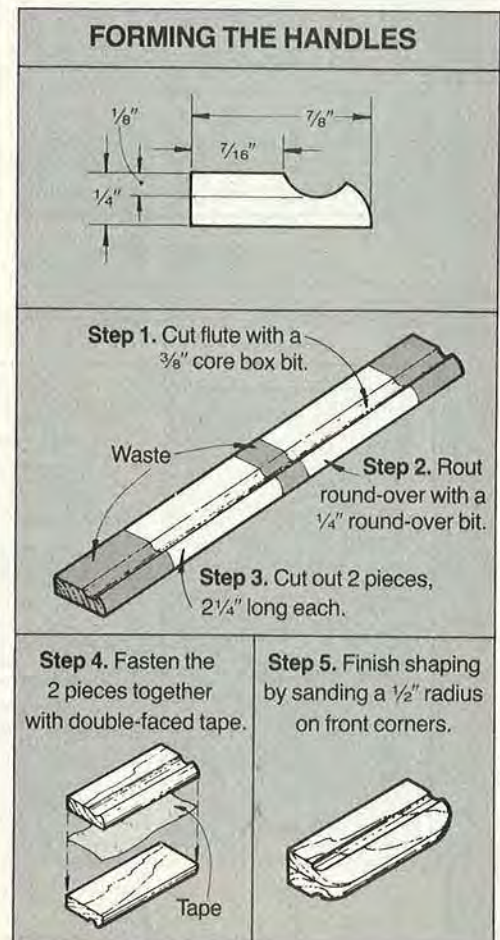
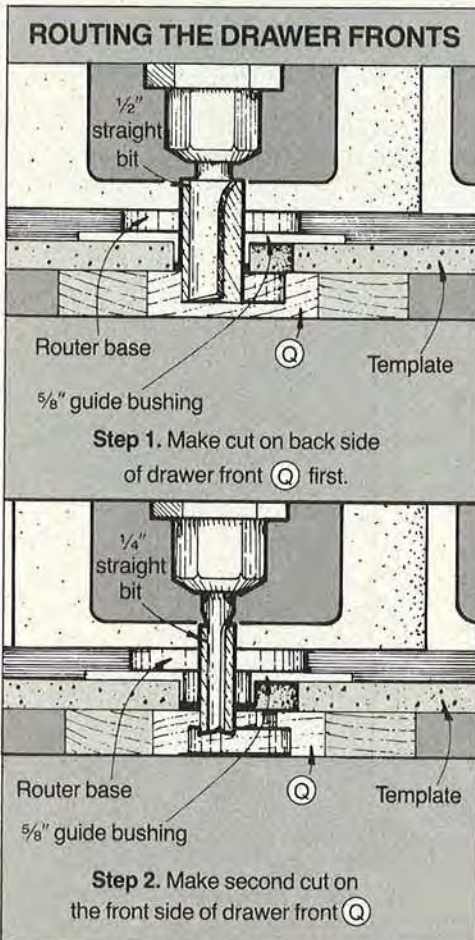
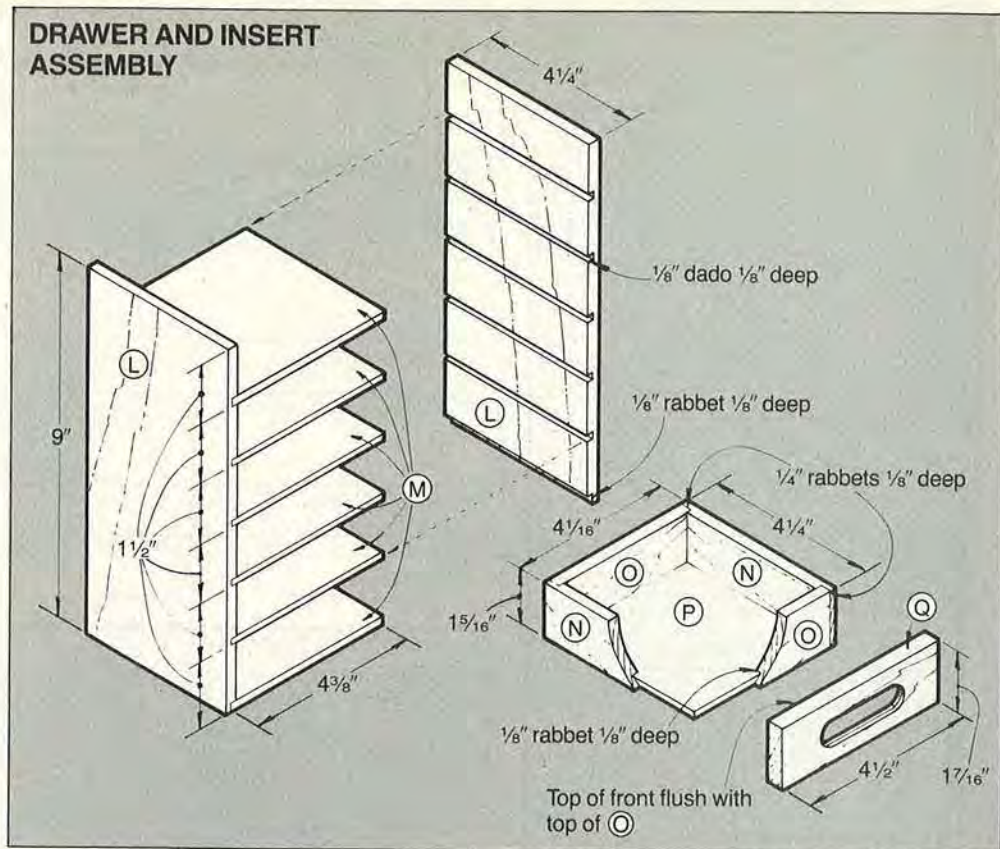
BUILDING THE DRAWERS

1 Rip three $1\frac{5}{16}$ " strips from $\frac{1}{4}$ " bird's-eye maple as laid out in the Cutting Diagram, *page 75*, for the drawer sides (N) and ends (O). Cut a $\frac{1}{8}$ " rabbet $\frac{1}{8}$ " deep along one edge of each strip to accept the drawer bottoms. Finally, cut the drawer sides and ends to length (see the Bill of Materials).

2 Cut $\frac{1}{4}$ " rabbets $\frac{1}{8}$ " deep along both ends of each drawer side.

3 Cut six drawer bottoms (P) to size from $\frac{1}{8}$ " hardboard.

4 Glue the drawers together, using a band clamp or rubber bands to hold each assembly together while the glue dries. Check each drawer for square while the glue is still wet.



5 After the glue has dried, remove the clamps and scrape off any excess glue. Sand each drawer smooth.

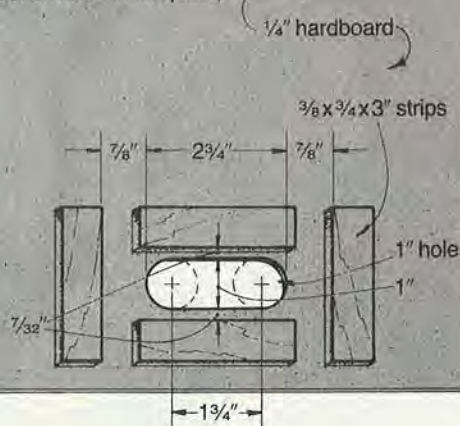
MAKING THE DRAWER FRONTS

1 Make the walnut drawer fronts (Q) by cutting $\frac{3}{8}$ " walnut to the dimensions listed in the Bill of Materials.

2 To form the finger pull in each front, start by making the template shown in the drawing, *below*. First,

DRAWER-FRONT TEMPLATE

(Bottom side of template)



drill two 1" holes $1\frac{3}{4}$ " apart on center through $\frac{1}{4}$ " hardboard. Then, cut out the section between the holes with a jigsaw, and smooth the edge of the opening with a rasp and sandpaper. (Take your time when forming the opening on the template for pleasing results on the actual drawer fronts later.) Glue wood strips to the hardboard so that each drawer front will be held firmly in place and centered on the template opening.

3 Install a $\frac{5}{8}$ " guide bushing (see the Buying Guide if you don't already have one) to the base of your router. Then, fit and adjust a $\frac{1}{2}$ " straight bit in your router to make a cut $\frac{1}{4}$ " deep in the drawer front, as shown in Step 1 of the drawing, *left*. Rout out the recess on the back side of each drawer front.

4 Replace the $\frac{1}{2}$ " bit with a $\frac{1}{4}$ " straight bit. Turn the drawer front (Q) over in the template and make the second cut as shown in Step 2 of the drawing, *left*.

ATTACHING THE DRAWER FRONTS AND CAROUSEL

1 Slide the drawers into the drawer openings. The front surface of each drawer should be flush with, or slightly shy of, the front edge of the insert assembly (L, M). If not, sand the drawer ends until you have a good fit.

2 Starting at the bottom and working up, glue and clamp a drawer front to the front of each drawer, centered from right to left and flush with the top edge (see the Front-View Drawing, *page 75*, for proper clearance around each drawer front). If the spacing is too tight, just sand the edge of the drawer front down a bit. When you're finished, remove the case back (J) and spacers.

3 Make the carousel (R) by cutting a $4\frac{3}{8}$ "-diameter disk to shape from $\frac{3}{8}$ " walnut with a band saw. Sand the edges smooth. Then, drill a $\frac{3}{16}$ " hole through the center of the walnut disk and a $\frac{1}{16}$ " pilot hole for each of the brass hooks, where shown in the Top and Carousel Drawing, *page 69*.

FITTING THE DOORS AND MAKING THE HANDLES

1 Using a table saw or small hand plane, size the doors by shaving equal amounts off opposite edges (be careful not to remove too much stock at one time). Fit the doors flush with the sides of the case. There should be a $\frac{1}{16}$ " gap between the two doors and between the top and bottom edges of the case.

2 Cut mortises for hinges in the doors and case where shown in the Side-View Drawing, *page 71*. Now, drill pilot holes for the hinge screws in both doors and sides (because the doors are so thin, use a stop on your drill bit). Check the length of the hinge screws against the thickness of the doors — you will probably need to shorten the screws with a file. Do *not* attach the doors yet.

3 To make the door handles (S), cut a strip of $\frac{1}{4}$ "-thick maple to $\frac{7}{8}\times 8$ " (be sure to use a push block

when ripping to prevent kickback). Then, follow steps 1 through 5 in the drawing, *opposite page*. Use a dado blade in your table saw to cut a notch in each door for the handles (see the Side View, *page 75*, for placement). Glue and clamp a handle to each door.

APPLYING THE FINISH AND FINAL ASSEMBLY

1 Use masking tape and paper to protect the mirror in the divider. Then, apply the finish of your choice to the drawers, doors, carousel, and case. (We sprayed on one coat of sanding sealer and followed up with two coats of lacquer. Whenever we use a spray-on finish, *especially* a lacquer, we always use a fume-respirator mask. The mask guards against vapors and dust.

2 Fit the back (J) onto the case, mark the position of the mirror, and remove the back. Glue the mirror to the hardboard back. Glue the back to the case. (We used rubber bands to hold the back in position until the glue dried so as not to mar the finish.) Attach the glass panes to the left frame and the doors.

3 Screw the cup hooks in place, and attach the carousel to the case top with a screw and washer (the washer goes between the carousel and top). Leave the screw just loose enough so that the carousel will turn easily.

4 Attach the doors and epoxy the magnet to the divider. Snip off all but $\frac{1}{8}$ " from two 1x17 flathead nails. Drill a pilot hole and epoxy the nailheads in place, one on each door, centered on the magnet. (When drilling the pilot holes, be careful *not* to drill through the door.)

5 Line the bottom of each drawer with velvet or felt. You can also custom-fit the drawers with either dividers or padded compartments for storing rings and other accessories. 🍀

Produced by: Marlen Kemmet with Yosh Sugiyama
Project Design: Inga Vesterby
Photographs: Hopkins Associates
Illustrations: Bill Zaun; Randall Foshee



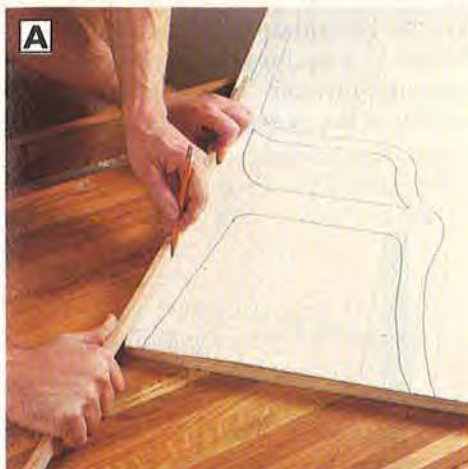


Tea for Two!

Print this article

Tiny Table and Chairs

Jill and Bailey, two very proper 4-year-olds, shared afternoon tea at *WOOD* Magazine not long ago. Our little table and chairs helped the occasion seem very grown-up indeed. Build this set from just one 4x8' sheet of plywood (we used ribbon-stripe mahogany) and delight someone special.



FIRST, CUT OUT THE CHAIRS

1 Cut your plywood panel into two 48x48" pieces. Noting the direction of the veneer grain in the Cutting Diagram, *page 76*, rip two 13x48" pieces from one of the pieces to yield the four chair sides (A).

2 Using a ruler and a straightedge, lay out 1" squares on a large piece of heavy paper to form a 15x30" grid pattern. Transfer the profile of the chair side from the Chair-Grid Drawing, *below*, to the full-sized pattern. (To form the long curve on the back leg, we worked with a helper and bent a flexible strip of wood as shown in photo A, *left*.)

3 Use spray adhesive or double-faced tape to secure the pattern to the plywood. Use a band saw or

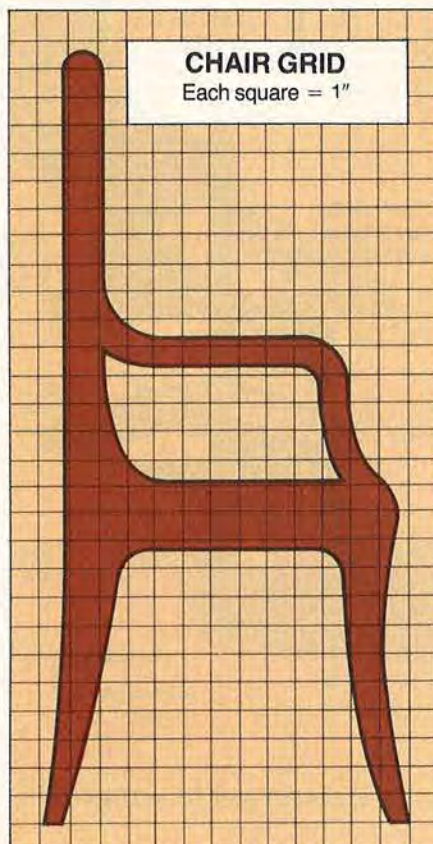
jigsaw fitted with a fine-toothed blade to cut the chair side to shape, cutting just *outside* the marked lines. To make the cutouts, drill a blade-access hole through the chair side, then cut just *inside* the marked line with a jigsaw.

4 Sand the chair side to finished shape. (This side will serve as a template for the others, so take your time.) Now, remove the pattern, and sand off any sticky residue.

5 Trace the outline of your template onto the 3/4" plywood for the three remaining chair sides. Cut the chair sides to shape, cutting slightly to the scrap side of the marked lines.

6 Use double-faced tape to stick the template to one of the rough-cut chair sides. Center the template on the rough-cut piece so that the excess of the rough-cut piece protrudes over both edges of the template. Then, fit your router with a 1/4" flush-trim bit. With the template on the bottom, lower the bit so that the pilot rides on the template, and trim the rough-cut side to shape as shown in photo B, *far left*. Now, separate the two chair sides, and repeat the routing procedure with the remaining chair sides, always using the same template. Sand the routed edges smooth.

7 Lay out the shape of the backrest (B) on a piece of paper (see the Front-View Drawing, *page 76*, for dimensions). Cut the pattern and secure it to the plywood as shown in photo C, *far left*. Trace the outline of the backrest onto the plywood, and remove the pattern. Drill 1/2" blade-access holes where necessary for the interior cuts, and cut



Continued

Tiny Table and Chairs

the backrest to shape with a jigsaw. Finally, sand all the edges smooth. **8** Using the first backrest as a template, make the second, just as you made the second chair side (refer back to steps 5 and 6).

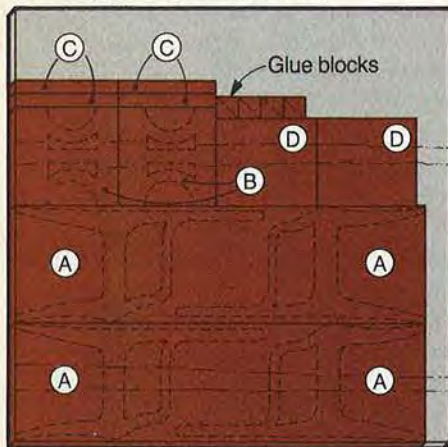
ASSEMBLING THE CHAIRS

1 Cut the stretchers (C) to the size listed in the Bill of Materials. Locate the center of each rail end, and drill a $\frac{1}{8}$ " pilot hole $\frac{1}{2}$ " deep for later ease in fastening between the chair

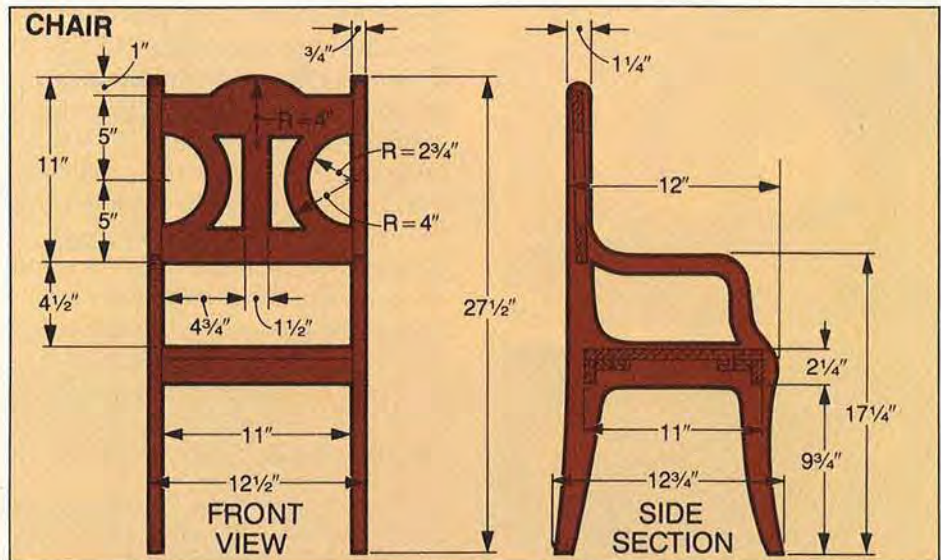
sides. Sand a slight round-over on the bottom edges of each stretcher. **2** Mark the location of the stretcher and backrest mounting-screw holes on one chair side where indicated on the Exploded-View Drawing. Stack the chair sides in pairs, and drill $\frac{5}{32}$ " pilot holes through both sides where marked. Switch to a $\frac{3}{8}$ " drill bit and counterbore the holes $\frac{3}{8}$ " deep on the outside face of each chair side.

3 Dry-clamp the chair sides, stretchers, and backrest together, tilting the backrest where shown in the Side-Section Drawing, below. (We used a small nail to help line up the holes in the stretchers with the holes in the chair sides.) Drive the screws into place. Switch back to a $\frac{1}{8}$ " bit and drill the mounting holes $\frac{1}{2}$ " deep into the backrest, centered through the $\frac{5}{32}$ " holes drilled in the previous step.

Cutting Diagram (Chairs)



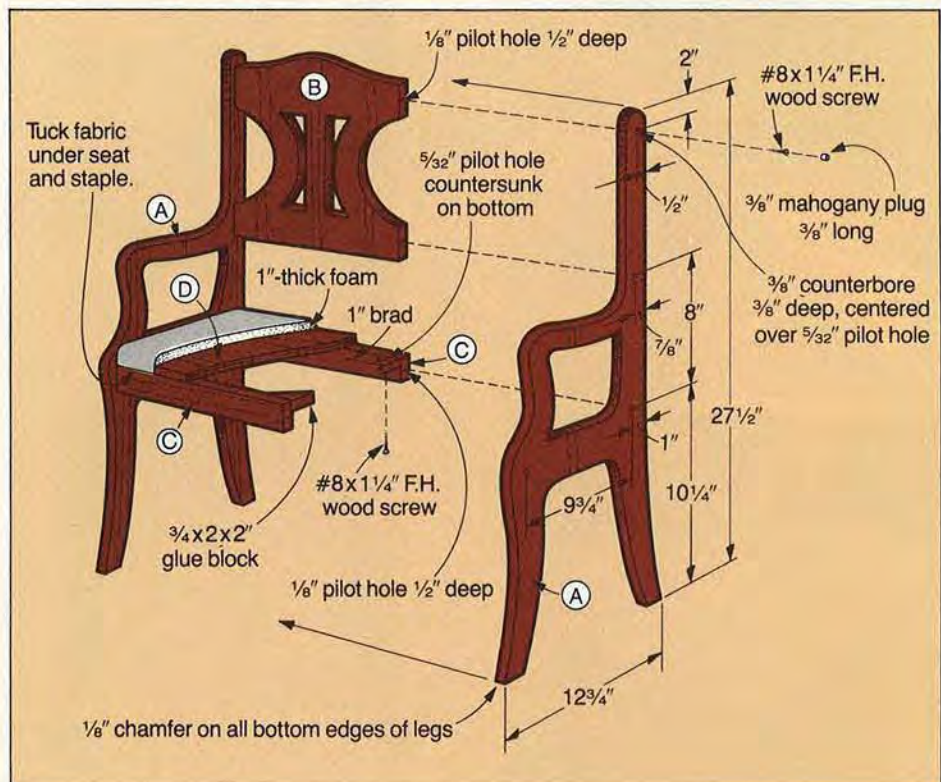
$\frac{3}{4}$ x48x48" Mahogany Plywood



Bill of Materials					
(FOR TWO CHAIRS)					
Part	Finished Size*			Material	Qty.
	T	W	L		
A*	$\frac{3}{4}$ "	$12\frac{3}{4}$ "	$27\frac{1}{2}$ "	mahogany plywood	4
B	$\frac{3}{4}$ "	11"	11"	mahogany plywood	2
C	$\frac{3}{4}$ "	$1\frac{1}{2}$ "	11"	mahogany plywood	4
D	$\frac{3}{4}$ "	11"	$10\frac{7}{8}$ "	mahogany plywood	2

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

Supplies: #8x1 $\frac{1}{4}$ " flathead wood screws, #8x1" flathead wood screws, 1" wire brads, wood filler, polyurethane-sanding sealer, stain, polyurethane, paste wax, #0000 steel wool, double-faced tape, heavy paper for grid patterns, 1" foam padding, 1 sq. yd. upholstery fabric



4 Back out the #8x1¼" rail mounting screws and apply glue to the stretcher and backrest ends. With the chair on a flat surface, screw the stretchers and backrest in position, checking the stretchers and backrest for square against the chair sides.

5 Using a ⅜" plug cutter, cut 16 plugs from solid mahogany stock planed down to ⅞". Glue a plug in place over each of the screws, matching the direction of the grain with the chair sides. When the glue dries, sand the plugs flush, being careful not to sand through the plywood veneer.

6 Cut the triangular glue blocks to the size indicated on the Exploded-View Drawing. Then, use glue and 1" brads to attach them to the chair frame flush with the top edges of the stretchers. Drill and countersink a ⅜" mounting hole on the bottom of the glue block.

7 Cut the chair seat (D) to the size listed in the Bill of Materials. (The seat measures ⅛" narrower than the completed chair frame to allow for the upholstery.) Then, use the seat as a template to cut a pad from 1"-thick foam. Now, cut two pieces of upholstery to 17x17", and staple the upholstery as shown in photo D, below.

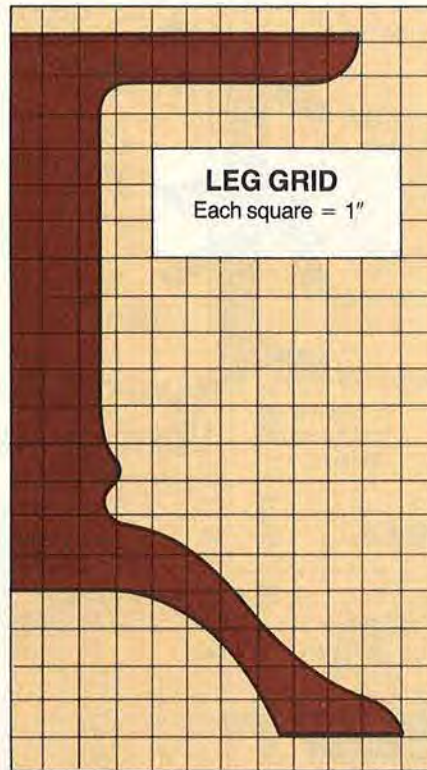
8 Position the seat where shown in the Side-Section Drawing, page 76, and drill ⅛" pilot holes ½" deep, using the previously drilled holes in the glue blocks as guides.

CONSTRUCTING THE TABLE

1 Cut two 22x19¼" plywood pieces for the table legs (E) as shown in the Cutting Diagram.

2 As you did with the chairs, lay out on paper a 1" grid pattern measuring 21x24". Mark the vertical centerline. Working from the right side of the centerline, transfer the half shape of the table leg to the grid (see the drawing, below).

3 Fold the grid paper along the centerline, and tape the top and bottom edges of the halves together.



Cut out the pattern, remove the tape, and unfold the paper to yield a full-sized leg pattern.

4 Tape or use spray adhesive to secure the pattern in place, then trace the leg outline onto the plywood. Use a jigsaw to cut the leg to shape, cutting just *outside* the outline. Sand the edges smooth.

5 Using the first leg as a template, follow the procedure in steps 5 and 6, page 75, to form the second leg.

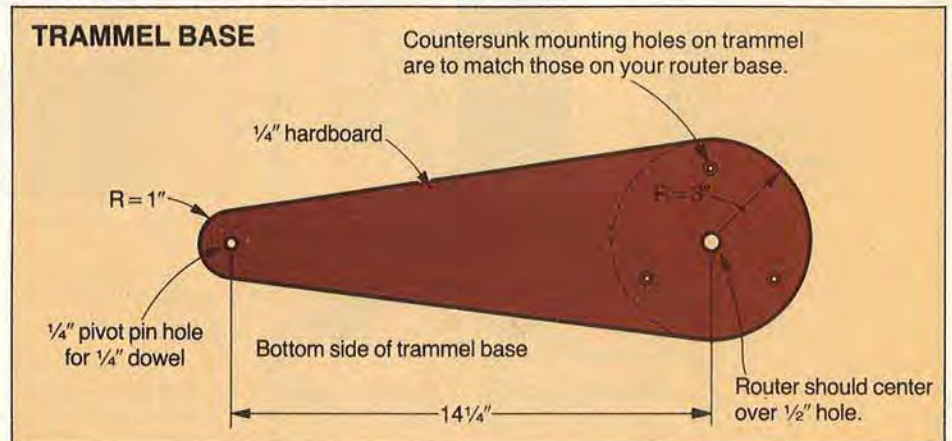
6 Lay out and mark a ¾" notch 7⅝" long on each of the legs where shown in the Exploded-View Drawing. Cut the notches with a jigsaw fitted with a fine-toothed blade.

Sand the edges of the notches smooth. (We wrapped sandpaper around a flat scrap of wood to keep the notches straight when sanding.) Glue and clamp the assembly together, checking for square.

7 Cut a piece of ¾" plywood to 28½x28½" for the tabletop (F). Place the top with the best face down on a clean work surface, being careful not to scratch the veneer face. Mark diagonal lines from opposite corners of the top to locate the center. Drill a ¼" hole ½" deep at the center point, taking care not to drill through the tabletop (we used a stop on our drill bit to prevent drilling too deep).

8 From ¼" hardboard, construct a trammel base like the one shown and described in the drawing, below, for your router.

Continued



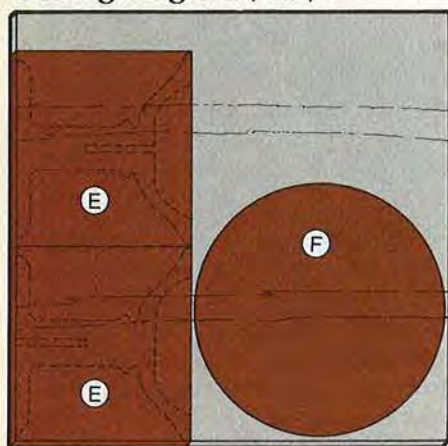
Tiny Table and Chairs

Bill of Materials					
(FOR ONE TABLE)					
Part	Finished Size*			Material	Qty.
	T	W	L		
E*	3/4"	22"	19 1/4"	mahogany plywood	2
F*	3/4"	28" diam.		mahogany plywood	1

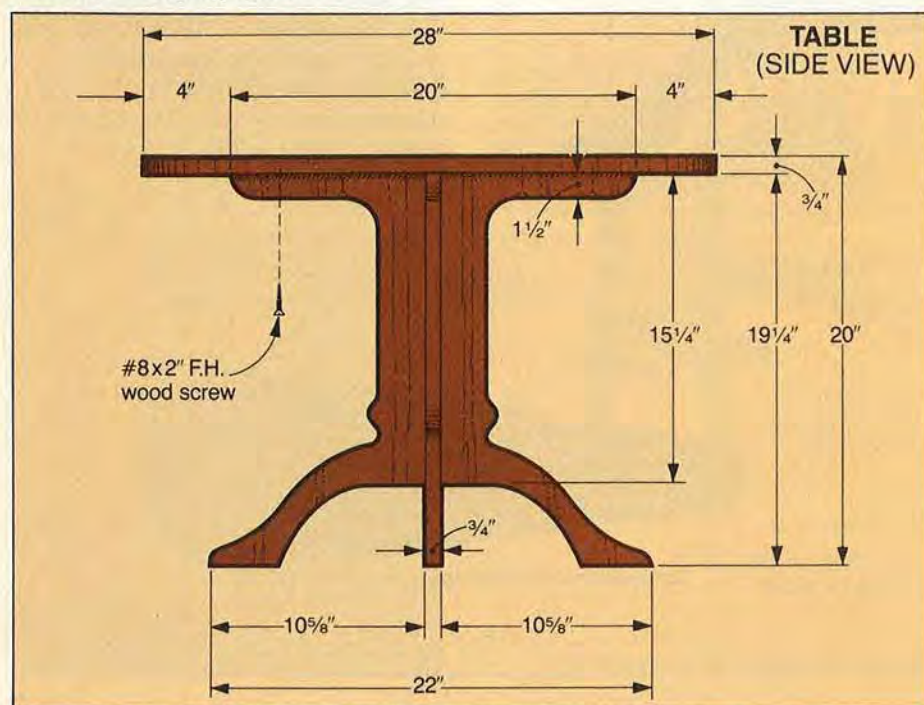
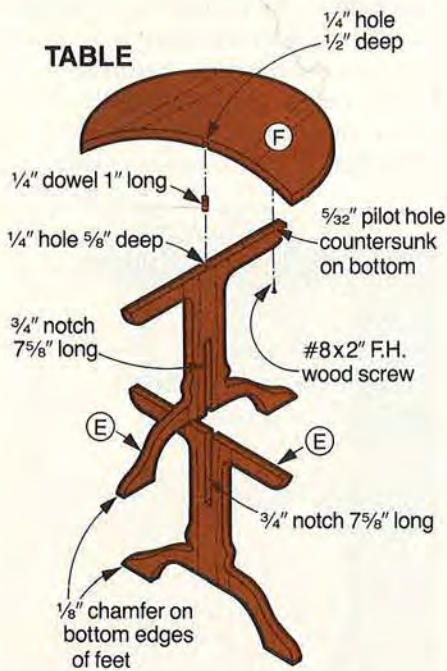
*Parts marked with a * are cut larger initially, then trimmed to finished size. Please read the instructions before cutting.

Supplies: #8x2" flathead wood screws, 1/4" dowel, same finishing supplies as chairs.

Cutting Diagram (Table)



3/4 x 48 x 48" Mahogany Plywood



9 Mount the trammel base on a 1/4" dowel pin in the centered hole in the bottom of the tabletop. With a 1/2" straight bit, slowly rout the round tabletop as shown in photo E, left. Set the router to cut 1/4" deep initially, followed by successively deeper passes (place a scrap piece of plywood below the tabletop blank to protect your workbench surface on the final pass).

10 Drill a 1/4" hole 5/8" deep centered in the top of the leg assembly, then glue a 1/4" dowel 1" long in the hole. Glue and clamp the top in place. With a 5/32" bit, drill, then countersink two holes in each leg where shown in the Exploded-View Drawing. Further secure the tabletop to the leg assembly with #8x2" screws.

THE PERFECT FINISH

1 Fill any voids or chips in the veneer with wood filler (we used mahogany-colored Fix Wood Patch). Finish-sand the chair frames and the table (we started with 150-grit and finished off with 220-grit sandpaper). Then, sand a very slight sandpaper break on all edges to prevent splintering. Using a sanding block, sand a 1/8" chamfer on the bottom edges of each chair leg and the feet of the table to prevent snagging carpets and rugs.

2 Stain the pieces. Apply two coats of polyurethane-sanding sealer, rubbing between coats with 220-grit abrasive.

3 Apply two coats of polyurethane finish, sanding lightly between coats. When the finish has dried, rub the pieces down with #0000 steel wool and paste wax. Put a final buff on the finish with a soft cloth. (We found that a piece of terrycloth mounted on a palm sander worked great.)

4 Screw the upholstered seats in place and deliver the furniture to its new owner. 🌳

Produced by Marlen Kemmet
with Kerry Gibson
Photographs: Jim Kascoutas
Illustrations: Kim Downing

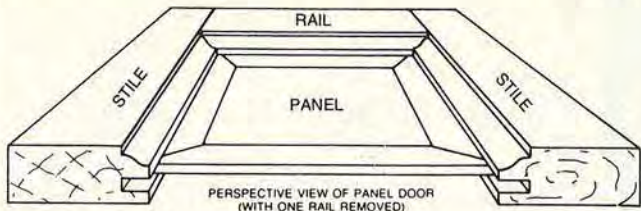
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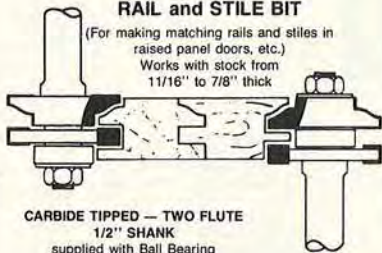


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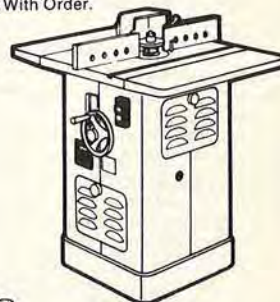
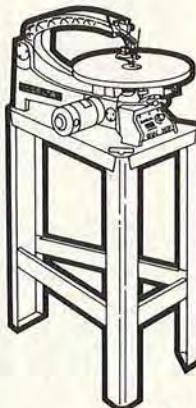
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S500A	3x5 1/2 Finish Sander	70	41
SU6200	Finishing Sand 1/2 Sheet	142	88
B7075	3x2 1/2 dustless Belt Sand	179	116
B7100	3x2 1/2 dustless Belt Sand	208	140
B7200A	4x2 1/2 dustless Belt Sand	269	165
D100VR	3 3/8" VSR 0-1200 rpm drill	91	49
W640	7 1/4" 13 amp circular saw	158	99
W740	8 1/4" 13 amp circular saw	171	109
J560	Jig Saw-Single Speed	172	99
J5660	Jig Saw-electronic v speed	198	123
R150	1 H.P. Plunge Router	138	86
R330	2 H.P. Router	220	138
R500	3 H.P. Router	265	163
E3800	Drywall screwdriver 0-4000	126	79
L1200	3 5/8" Planer	142	89
B0102R	3 3/8" 2-spnd Cordless Drill		
	w/ free holster-Xtra special buy	148	95
TS251U	10" Mitre Box	300	169
SG1150C	4 1/2" H.D. Mini-Grinder	99	59

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0234-1	1/2" drill 4.5A magnum	159	112
0244-1	1/2" drill 4.5A magnum	159	115
0222-1	3/8" drill 3.3A 0-1000 rpm	149	92
0228-1	3/8" drill 3.3A 0-1000 rpm	126	99
0375-1	3/8" close quarter drill		
	- NEW - 3.5 amp	175	118
0210-1	3/8" cordless drill		
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6539-1	cordless screwdriver		
	- NEW - 190 RPM	84	59
1007-1	1/2" drill 4.5A D-Hdle	199	145
1107-1	1/2" drill 4.5A D-Hdle	204	145
3300-1	magnum rt angle drive kit	249	170
3102-1	Pimbrs rt angle drill kit	263	180
1676-1	HD Hole Hawg w/cse 2 sp	333	235
5395	3/8" sgle sp hammer drill kit	203	150
5397	3/8" var sp hammer drill kit	208	155
5371-1	HD mag. hammer drill 1/2"	287	207
5373	HD mag. ham. drill 3/8"	240	175
6511	2 speed Sawzall w/case	181	122
6226	port band saw 2 sp w/case	382	280
6234	TSC band saw port w/case	382	280
6405	8 1/4" circ. saw 13 amp	179	127
6406	10 1/4" 15 amp w/case	349	245
6165	1 1/2" Chop saw 15 amp		
	4200 R.P.M.	285	189
6255	v/sp Jig Saw 3.8 amp	199	140
6245	sgle sp Jig Saw 3.8 amp	175	125
6012	1/2 sheet HD Orb. sander	159	110
6014	1/2 sheet HD orb. sander	169	112
5660	1 1/2 HP router 10 amp	265	175
5680	2 HP router 12 amp	314	220

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Univ. Bore — Professional Series			
CARBIDE TIPPED SAWBLADES			
Item No.	Description	Diam. Teeth	List Sale
PS203	Gen'l Purp. 7 1/2"	24	27.24 17.50
PS303	Fine cutting 7 1/4"	40	32.97 20.50
5/8" Bore — Industrial Grade			
CARBIDE TIPPED SAWBLADES			
Item No.	Description	Diam. Teeth	List Sale
LU72M010	Gen-l Purp. 10"	40	68.58 34
LU81M010	Gen-l Purp. 10"	40	69.30 35
LU73M010	Cut-Off 10"	60	79.65 36
LU82M010	Cut-Off 10"	60	86.40 44
LU84M010	Combination 10"	40	70.99 36
LU84M011	Combination 10"	50	74.51 37
LU85M010	Super Cut-Off 10"	80	110.88 62
LU87M010	Ripping 10"	24	64.85 34
DS 308	6" Dado		139.00 92
DS 308	8" Dado		170.00 105
TR 100	3 blades & Dado set		399.00 255

MAKITA CORDLESS FESTIVAL OF VALUES		List	Sale
Model	Jig Saw	158	99
43000DW	3 3/8" Saw Kit	174	95
5081DW	6 1/4" Circular Saw	224	125
5600DW	Finishing Sander	128	73
9035DW	3 3/8" Cordless Drill Kit	152	88
6010DWK	3 3/8" Cordless Drill	84	45
6010SDW	3 3/8" Hammer Drill	188	105
DA30000DW	3 3/8" Angle Drill	176	98
6010DL	3 3/8" Drill w/Flashlight	162	89
6012HDW	3 3/8" 2 spd Driver Drill w/Bat & Metal Case	178	98
DK1002	3 3/8" Drill w/Fluorint Lt	164	90
6710DW	Cordless Screwdrvr Kit	148	84

DELTA BENCH TOP TOOLS		List	Sale
Model	8" Bench Drill Press	124	100
11-950	8" Bench Band Saw	158	125
28-160	10" Scroll Saw	105	85
40-500	6" Grinder Bench	62	50
23-680	8" Grinder Bench	99	85

MAKITA TOOLS		List	Sale
BO4510	Sander	79	43
9900B	3" x 21" belt sander	198	119
9924B	3" x 24" belt sander	189	130
9924DB	3" x 24" b/sand. w/bag	214	130
9035	1/2 sheet finish sander	79	48
9045E	1/2 sheet finish sander	156	90
9045SN	1/4 sh ft. sand. w/bag	158	105
4200N	4 3/8" circ. saw 7.5 amp	152	93
5008NB	8 1/4" circ. saw 13 amp	178	105
5201NA	10 1/4" circ. saw 12 amp	348	215
4300NB	v/sp jig saw 3.5 amp	192	120
4301BV	orb v/sp jig saw 3.5 amp	208	125
JR3000WL	2 sp recip saw w/case	168	120
JR3000V	vs recip saw w/case	178	120

MAKITA TOOLS SPECIAL PROMOTION		List	Sale
LS1000	New 10" Mitre Box	348	198
792210-7A	Carbide Bid for above	45	31
9820-2	Blade Sharpener	244	159
741074-9	60 (coarse) Grdg Whl	33	23
741070-7	1000 (med) Grdg Whl	30	22
741071-5	6000 (fine) Grdg Whl	43	30

DELTA CONTRACTORS SAW		List	Sale
1900BW	3 1/4" planer w/case	154	92
1100HD	3 1/4" planer w/case	278	160
3608BK	3/4 hp router w/case	132	85
3601B	1 3/8 hp router	166	115
3700B	1/2 hp trimmer		
	28,000 rpm	124	82
804530	6" Round Sander	84	48
0A3000	3 3/8" angle drill	158	105
0P4700	1 1/2 v/sp w/rev 4.8 amp	154	92
HF1030W	3 3/8 v.s.r. hammer drill w/case	145	98
6300DLR	1 1/2" angle drill w/rev.	229	152
841988-2W	1 1/2" s. sp. hammer drill w/case	238	150
GV5000	Disc Sander	79	53
6800DB	2500 rpm 3.5 amp	123	79
6800DBV	0-2500 rpm 3.5 amp	133	89
6801DB	4000 rpm 3.5 amp	123	79
6801DBV	0-4000 rpm 3.5	133	89
2030n	12" planer/jointer	2160	1475
2040	15 3/8" planer	1780	1195
1805E	6 1/8" planer kit w/case	416	265
JV1600	var. speed jig saw	145	89
JV2000	var. speed orb. jig saw	165	100
5005BA	5 1/2" circular saw 8 amp. with brake	154	98
9207SPC	7" var/sp speed electronic sander/polisher	209	130
9303BH	4 1/2" sander-grinder kit	146	95
4014NV	var/speed blower	128	79

DOWL JIGS		List	Sale
MODEL	DOWL-IT		
1000		32.95	23.95
2000		42.95	32.95
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52D	7" jaw - 8" Opening	69.00	51.00
5212D	9" Jaw - 13" Opening	92.00	76.00
3M Co. Respirators			
#8500 Box of 50 - 10.00-Case of 600		89.00	
#8560 Box of 15 - 13.50-Case of 180		135.00	
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Model	STANLEY	List	Sale
33-116	PL-316 3/4" x 16" Rule	15.95	7.50
33-320	PL-320 3/4" x 20C Rule	16.95	7.95
33-425	PL-425 1" x 25" Rule	18.95	8.95
33-430	PL-430 1" x 30" Rule	20.95	9.95

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SAW-ATHON by PORTER-CABLE		List	Sale
#314	4 1/2" Trim Saw		
List 180		SALE 109	
#346-1	6 1/2" Top Hdle		
List 161		SALE 100	
#617	7 1/4" Push Hdle		
List 166		SALE 96	
#587	7 1/4" Speedronic		
List 199		SALE 125	
#315-1	7 1/4" Top Hdle		
List 166		SALE 96	
#368-1	8 1/4" Top Hdle		
List 176		SALE 110	

BELT SANDERS by PORTER-CABLE		List	Sale
#363	4" x 24" w/o Bag		
List - 280		SALE - 185	
#362	4" x 24" w/Bag		
List - 295		SALE - 198	
#503	3" x 24" w/Bag		
List - 510		SALE - 350	

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Model	DRILL KITS		
1930	3 3/8" rev/hl speed	165	110
1950	3 3/8" High Torque	165	110
5930	Reversible Hammer	179	120
1970	3 3/8" rev/hl torque screwdriver	179	120
1980	Rev/adj. clutch Scruddr	179	120

BRAND NEW! SUPER SPECIALS from MILWAUKEE		List	Sale
0214-1	3 3/8" c/less drive drill	159	109
8975	H.D. Heat Gun, 11.6A Low 570°F - High 1000°F	74	49
5920	belt sander 3x24 w/o bag	289	199
5925	belt sander 3x24 w/bag	309	215
5930	belt sander 4x24 w/o bag	299	209
5935	belt sander 4x24 w/bag	319	214

PORTER-CABLE = NEW ITEMS +		List	Sale
Model			
655	Drywall Driver 0-4000 Rev	115	85
367	3 1/4" Plane 6.5A	170	115
5009	Mortise & Tenon Jig	50	34
351	3" x 21" Belt Sander	189	125
352	3" x 21" Belt Sndr w/bag	199	135
9810	Cordless Screwdrvr kit	175	115
320	Abrasibe Plane 3A	129	91

* ROUTER RIOT * by PORTER-CABLE		List	Sale
Model			
100	7.7 H.P. 6.5 amp	141	98
630	1 H.P. 6.8 amp	150	100
690	1 1/2 H.P. 8 amp	194	130
691	1 1/2 H.P. D-Hdle 8 amp	218	145
536	1 1/2 H.P. Speedmatic Double Handle	300	190
537	1 1/2 H.P. Speedmatic Double Handle	315	215
520	3 H.P. Production	460	270
518	3 H.P. Microcompressor 5-sp	490	345

TRIMMERS by PORTER-CABLE		List	Sale
309	3.8 amp laminate trimmer	130	90
310	3.8 amp laminate trimmer	190	135
312	off-set base laminate trim	205	140
319	lilt-base laminate trim	215	150

* X-TRA SPECIALS * MAKITA TOOLS		List	Sale
6010DL	C/less Drill w/flashlight-charger & case	162	90
DP3720	3 3/8 drill Rev 0-1800 rpm	90	47
6510LVR	3		

DRUM-SANDING TABLE

Continued from page 53

HOW TO USE THE DRUM-SANDING TABLE FOR EDGE-SANDING

Fasten the drum-sanding table to your drill-press table with the machine screws, washers and wing nuts. Then, chuck a 3x3" sanding drum in the drill-press chuck. Use a straightedge to align the edge of the sanding drum with the *outfeed* side of the fence. Once the fence is in position, clamp it to the drum-sanding table. Attach the vacuum hose to the vacuum-hose adapter and start the vacuum and drill press. Feed the stock along the *infeed* side of the fence in the direction noted in the Exploded-View Drawing. The stock will come in contact with the sanding drum and have 1/32" sanded off when it reaches the outfeed side of the fence.

BUYING GUIDE

- **Vacuum-hose adapter.** (Called a "flange ferrule" by Shopsmith.) 2 1/4" interior, 2 1/2" exterior diameter, stock #AE-0135. Sold in sets of four. \$10 plus \$4 shipping and handling. Shopsmith, Inc., 6640 Poe Ave., Dayton, OH 45414, or phone toll-free 800/543-7586.
- **3" sanding drum.** 3x3", 3/8" shank, catalog #129-010, \$21.50. Abrasive sleeves for 3x3" drum, 120-grit, catalog #129-040, \$1.45 each. Woodworker's Supply of New Mexico, 5604 Alameda Pl. N.E., Albuquerque, NM 87113, or call 800/645-9292 to order.
- **Drum-sander kit.** Kit includes four drums: 2x1 1/2", 1 1/2x1 1/2", 1x1", 1/2x1". All 1/4" shanks. Sixteen assorted sleeves in 50, 80, and 120 grit. Catalog #500-1640, \$11.95. The Fine Tool Shops, Inc., P.O. Box 1262, 20 Backus Avenue, Danbury, CT 06810, or call 800/243-1037 to order.

Project Design: Gary Hood
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90303	Plunge Base Router, ¾ hp	472.50
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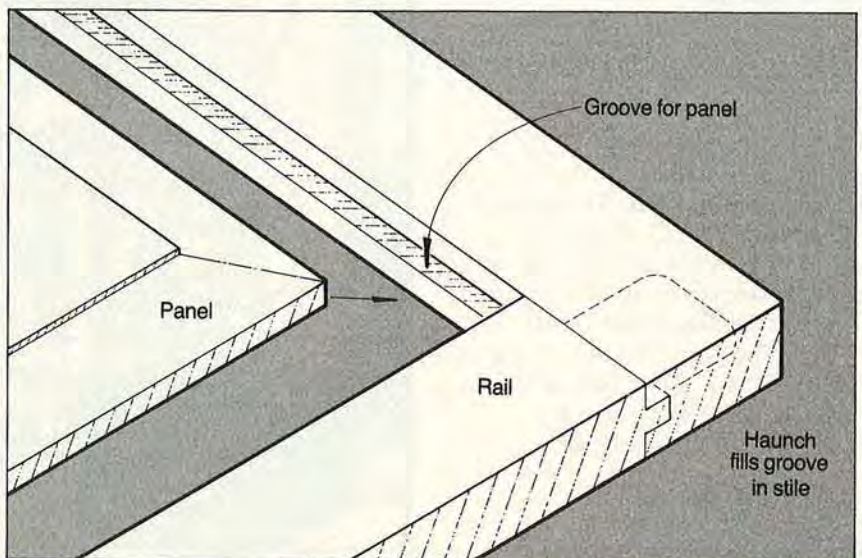
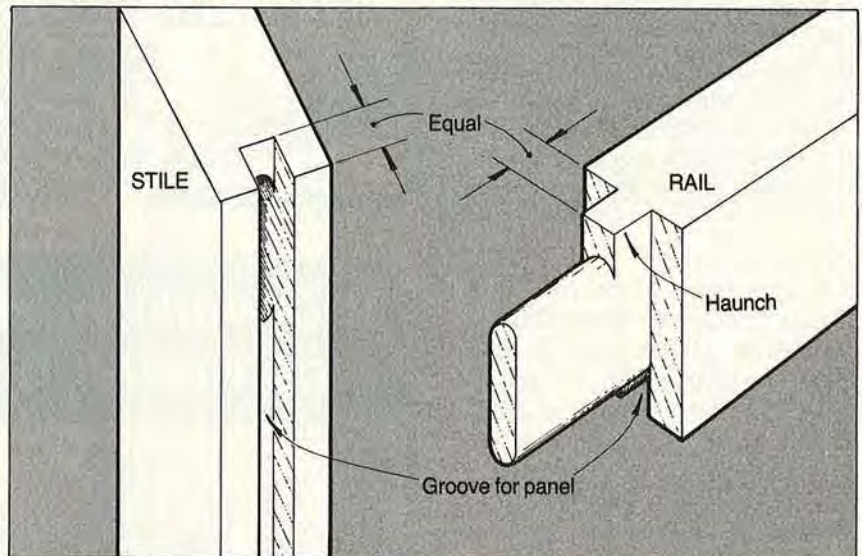
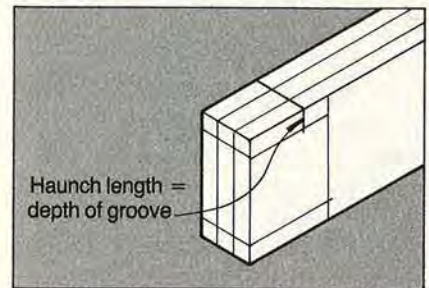
Raised-panel door and table and chair joints each call for a slightly different layout strategy.

THE HAUNCHED MORTISE AND TENON

When building raised-panel doors, it's common practice among woodworkers to cut a groove along the inside edge of each frame member to accept the panel. When faced with this situation, you need to create a haunch, or lip, on the tenon to fill the void created by the groove.

To do this, start by laying out the borders of the tenon as explained on page 38. Then, measure the depth of the groove in the frame, and lay out the haunch where

shown in the detail drawing below. Remember that the length of the haunch equals the depth of the groove. Cut away the material only back to this line, and you will have created the haunch you need.



THE MORTISE AND TENON WITH REVEAL

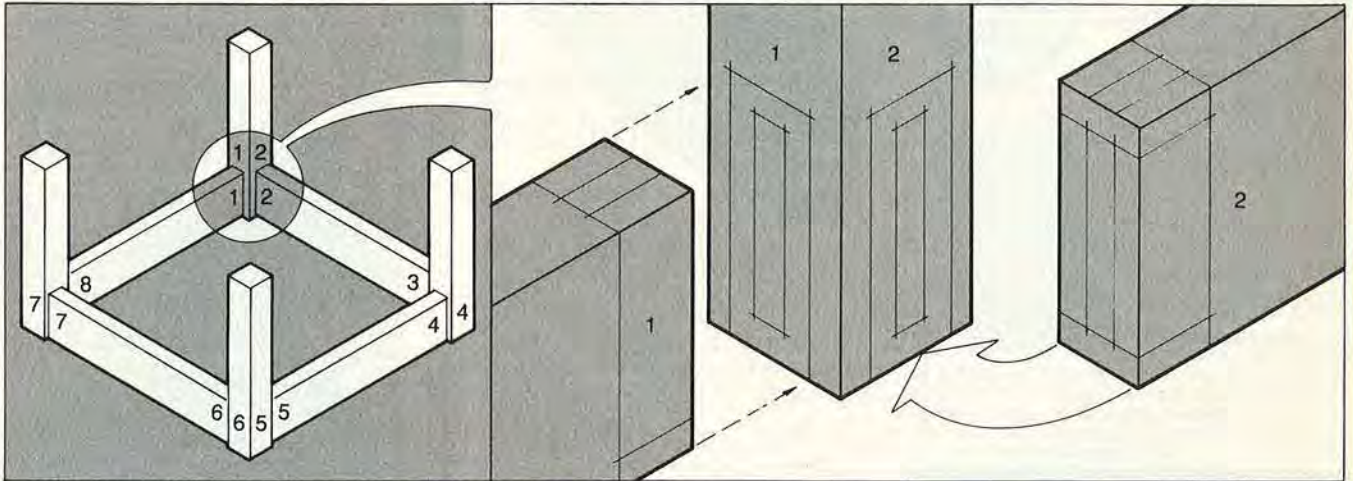
Lots of experienced woodworkers favor the mortise and tenon joint when joining the legs and aprons of tables (and for the legs and rails of chairs) because of its great strength. When laying out the location of the mortises on the legs, you must first

decide how much of a reveal (or setback) suits you. Aprons typically set back about 1/8" from the outside edge of the legs.

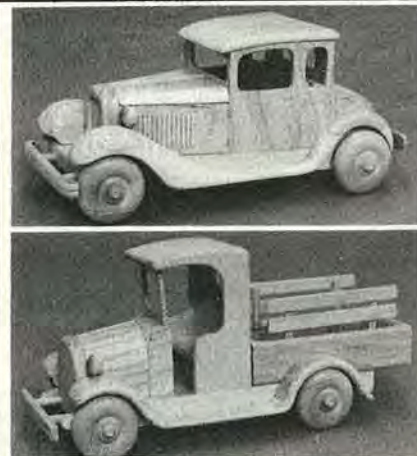
Then, in the case of a table, lay out the legs and aprons as shown in the detail below, number each of the joints for easy identification, carefully mark the outline of the

aprons on the legs, and layout the mortises and tenons as instructed on page 38.

When laying out a leg/rail joint for a chair, you follow pretty much the same procedures. However, you will have to clamp the legs and rails together when marking the outline of the rails on the legs. 🌲



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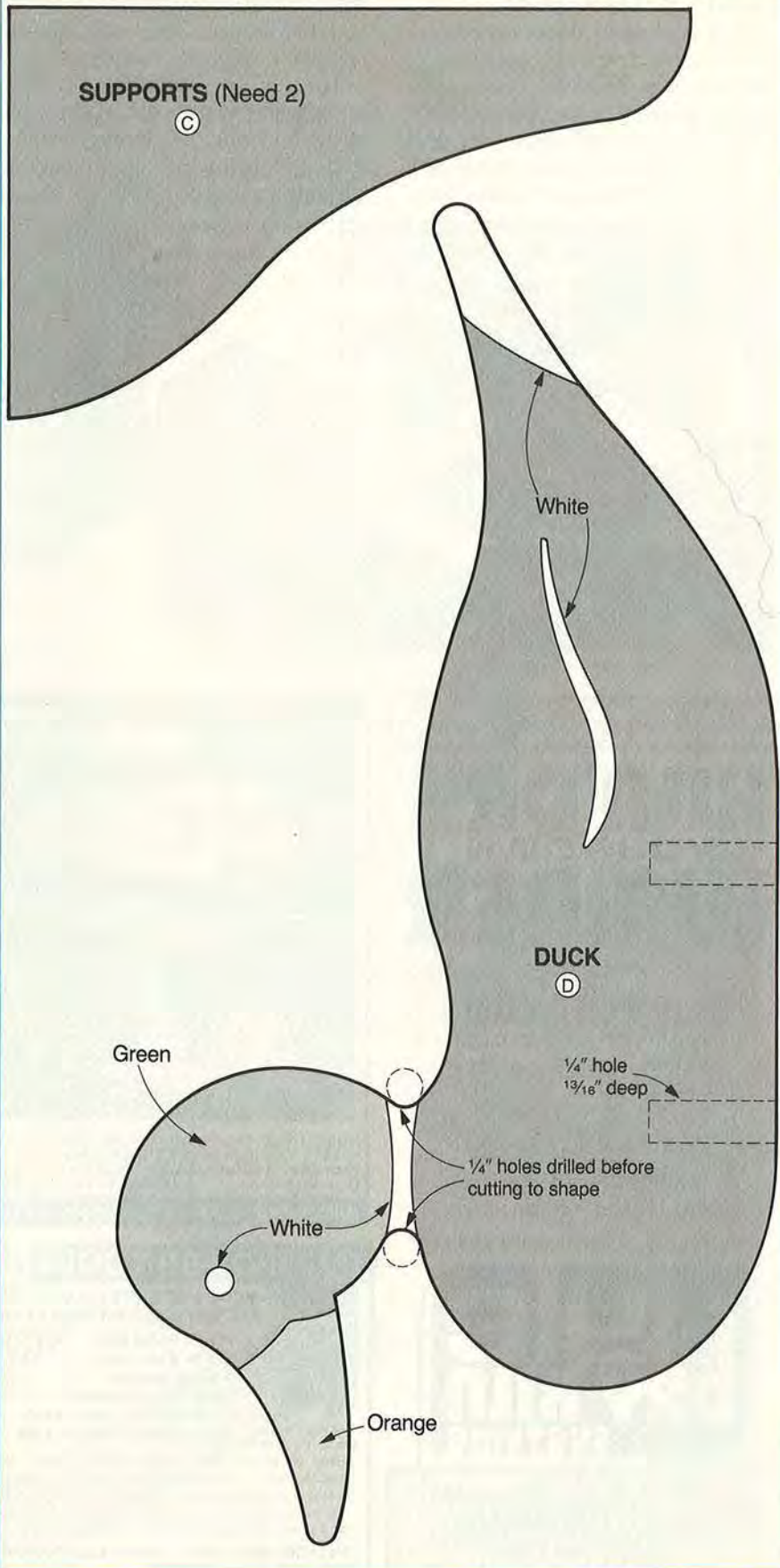
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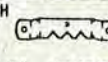
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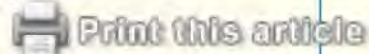
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Bringing home the wood

By Leon Powell, who brought us his warm memories of "The Christmas Wagon" in WOOD Magazine, December, 1985



The history of many an amateur craftsman is written in his woodpile. For years I've been bringing home wood from country sawmills, broken furniture, fallen barns, and bargain purchases. Looking back, I relate events and places to some prized piece of wood I've happened upon. Each trip or vacation has usually produced something — a rosewood board, maybe a walnut log, or a maple burl. I think many woodworkers do this. We're always looking for something more magnificent than we've ever used.

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Continued on page 88

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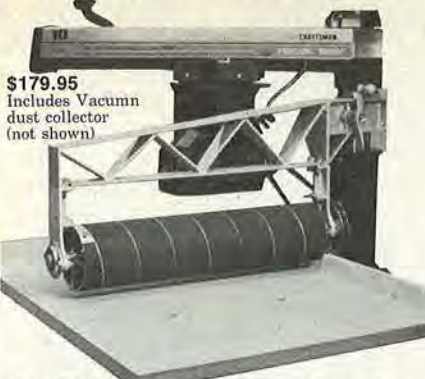


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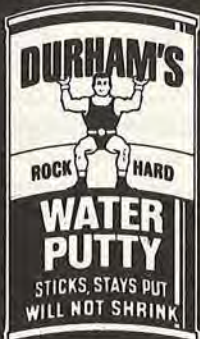


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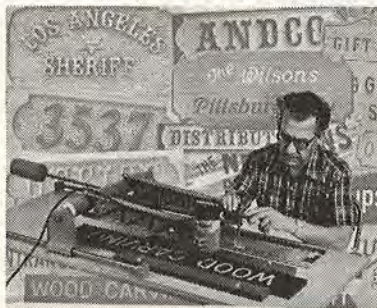
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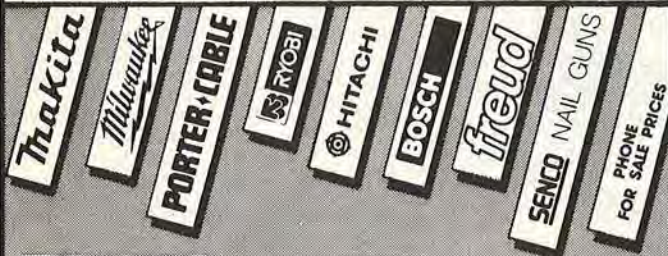
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Bringing home the wood

Continued from page 86

hardwoods and pine along a graveled road, into a dirt farm road that ended a mile later at a sagging barn.

Inside the barn, walnut lumber was stacked several planks deep on the ceiling joists. The boards had been plain-sawed about 1 1/2" thick, from 12-20" wide, and averaged 18' in length. "This is what it is," he told me. "It's been here for years. I'll never use it."

One batch of the lumber had been sawed from trees blown down in a 1924 tornado, but the remainder of it was newer, he explained, sawed after the trees were cut during land clearing in 1936. We agreed on price and he promised to deliver it.

At daybreak the farmer and a helper arrived with the walnut on a flatbed truck. The load looked bigger than it had in the barn, and prompted a "Where will you put it all?" from my astonished wife. "In the garage," I said. "Where else?"

The load half-filled the large garage, yet I steadfastly defended the purchase on grounds that such an opportunity might never come again. During succeeding days I frequently went out to admire those heavy boards, turning them over in my hands and dreaming of future projects. At the time I was doing a considerable amount of carving and part of the lumber went for that. It was a joy to work such well-seasoned wood.

I still had most of those walnut boards five years later when I moved 800 miles to a new job. Professionals moved the household goods, but I rented a truck and took the boards with me. Now, only about 20 remain.

“There is something uniquely appealing in the odd swirl of grain, in a certain tone or texture in the wood”

A recent survey of my woodpile, placed wherever I can find shelter for it, shows walnut crotches given by a neighbor, a walnut stump laboriously dug up with a shovel a few years ago, several 4x6" white oak timbers from pallets, and an unidentified species of yellowish wood with a reddish stripe running with the grain.

A bit added or taken and the woodpile changes. Some old cuts once considered ordinary have been opened to reveal something unusual. This happened not long ago when I turned two attractive bowls from spalted maple, which had previously been discarded and left to weather in the open air. Finding such surprises is why woodworkers collect wood. It all tells a story. This is the tree's memory of bygone summers, rains, winter storms, and stresses. The character of the tree, created from such natural forces, evokes a response in us and brings fulfillment when we work the wood.

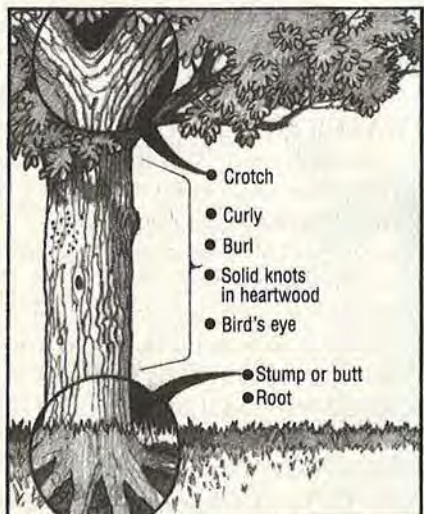
The only problem is where to store the next batch I'm sure to hear about soon. 🌲

FACTS ABOUT FIGURE

Want to work with figured wood? In most cases, it requires special care. Here's advice. For color photos and more information about figured wood, see page 42.

- Thick green slices of crotch wood and stump wood must dry very slowly. Coat them on all sides with paraffin or another sealer. Then follow this rule of thumb: Allow one year of drying time for every 1" of thickness.
- Avoid tearing out the hard "eyes" in bird's-eye by planing with abrasives only. Or, run the board through your planer at a slight angle. Reversing feed direction sometimes works, too.
- Stump, crotch, and burl often develop small splits along the grain. Use colored wood putty to fill.
- Figured wood doesn't stain evenly. Use clear finishes for best results.
- Figured wood from stumps, crotches, and burls really soaks up a finish, just as end grain does. Prevent this by applying a sealer first.
- Burl and crotch veneers aren't flexible. Handle with care.

Where to buy gunstock blanks:
Reinhart Fajen, Inc., Warsaw, MO 65355, catalog, \$5.
Johnson Wood Products, Rte. 1, Strawberry Point, IA 52076.



Figured wood and where you'll find it in the tree — if you're lucky! Loggers' trash can be your treasure.
 Illustration: Jim Stevenson [Print this article](#)



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BOATBUILDERS OF THE CHESAPEAKE

For thousands of years, Indians harvested the bounty of Chesapeake Bay, using boats made from trees felled along its shores. Their tools were seashells and fire — “somytymes burninge and somtymes scraping,” in the words of colonists who described the process.

Newly arrived English immigrants ridiculed the natives’ bevel-ended, hollowed-out canoes. Yet, even as

The Indians call this Watry Waggon canoo, a Vessel none can brag on; Cut from a Popular-tree or Pine and fashion’d like a Trough for Swine...

— Ebenezer Cook, 1708

the newcomers mocked, they couldn’t fail to notice that three Indians paddling a “hog trough” could easily outdistance eight of their own hard-rowing men. And it wasn’t long before the colonists, armed with iron-bitted axes and adzes, began copying the Indians’ canoe.

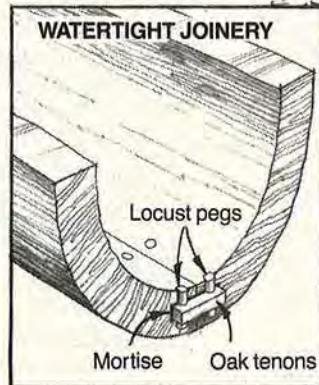
Occasionally, the settlers widened their canoes into vessels called “punts,” which a man pushing with a long pole could more easily maneuver than by paddling. They widened the canoe by filling the hollowed pine hull with water, then adding red-hot rocks until the water came to boiling. This wet-bending of the sides produced some stability, but only an experienced waterman cared to fire his musket broadside from such a vessel.

MAKING DO WITH SMALLER TREES

By the late 18th century, the huge trees used for canoes and punts in the early days became scarce. Those that remained were often far from the Bay and troublesome to move long distances.

In Virginia, local legend has it that a slave named Aaron was the man who solved the problem of how to continue making log boats in the absence of large trees. At his home on Lamb’s Creek in York County, he took two logs, maybe 20” in diameter, hewed them square with an ax, and placed them side by side. With a piece of charcoal, Aaron traced the lines of the boat on the top and sides. Then, he separated the logs and shaped them to the lines with an adze.

From time to time, the ingenious Aaron reassembled his log halves to study with his eyes the evolving grace and symmetry of the craft. No model or plan guided his work. As boatbuilders used to say, it was purely “winchum-squinchum.”



HEWING A CUNNER FROM FIVE LOGS

Top. Broadaxes in hand, two boatbuilders set about hewing a five-logged Chesapeake cunner.

Above left. Boatbuilders often used free tenons of oak with locust pegs to join watertight hulls.

Above right. Raising the gunwales from the original five logs took much piecing and fitting, but resulted in a sleek and handsome craft to clip the waves.

JOINERY FOR A WATERTIGHT HULL

After Aaron sculpted the timbers to 3”-thick half-shells, he faced fitting them together in a perfectly watertight seam. With time and a sharp blade, he could have worked the fit. But Aaron probably learned somewhere the shipwright’s trick of “kerfing in.”

Starting at one end of the seam between the temporarily rope-bound timbers, he ran his handsaw down the joint again and again. Each pass of the saw took an equal portion from each side of each tight place in the joint. When the sawteeth cut both sides for the whole length of the seam, the timbers were a perfect fit.

To join the halves, Aaron resorted to another ancient technique, the free tenon (see illustration, above). Into both faces of the seam he cut a series of 3”-long, 4”-deep mortises. Next, he set 8”-long oak tenons into each mortise in one of the halves. Finally, he forced the

Continued on page 93

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OLD HAND WAYS

Continued from page 90

two halves together with twisted ropes and locked the tenons into place by driving locust pegs into the holes bored through tenon and hull. Once in the water, the swelling timbers, restrained by the long grain of the oak tenons, forced the seam as tight as a Chesapeake oyster, and no water-proofing was used.

IMPROVEMENTS IN SPEED AND SIZE

Aaron later built a larger canoe from three logs, then an even larger one from five. Soon scores of the swift, graceful craft, copied from Aaron, were coursing the Bay — some as long as 50' and made from as many as seven logs!

Eventually, Aaron's successors added sails to speed the day's catch of fish or oysters to market far ahead of conventional sail-boats. The wider boats, however, presented a new problem.

Their keel logs could come from straight trees, but their outer "wing logs", forming the outward — then inward — curving gun-wales, required trees with the appropriate curves. Specimens such as these could only be found after days of searching. Yet, the rewards were many. In addition to speed, the boats were well-suited to fishing and oystering because they had no internal ribbing, making net- and trap-handling an obstacle-free chore.

These boats came to be called "cunners," and were still being made the original way into the 1930s. You can probably still find one or two skimming along today on the Chesapeake's waters. 🌿

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

Illustrations: Jim Stevenson, with the assistance of The Mariners Museum, Newport News, Va.

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We felt like Alice in Wonderland stepping through the Looking Glass when we walked into our first woodworking tool and machinery show. It's a golden opportunity to touch, use, and buy all those mail-order tools you've only read and dreamed about.

Woodworking shows have really caught on in just the past few years (Woodworking World, the Woodworking Show, and the Working with Wood Show are the three leading promoters). Now, they are held in many major cities across the U.S. Retailers, distributors, and manufacturers of tools, machinery, hardware, and supplies show off the latest in everything from multi-machines to lignum-vitae mallets.

In addition to products, you'll find a variety of instructional seminars, lectures, and technique workshops.

The wealth of information in the presentations and at the displays alone makes the trip well worthwhile. And you can pick up some great tips by just rubbing elbows with fellow woodworkers.

MAKE IT A DAY — OR A WEEKEND!

Come early, stay late, and bring your billfold. These three tips alone can make the difference between enjoying yourself and really enjoying yourself. Most of the shows start on a Friday and run through Sunday afternoon, so you may even want to combine the show with a

weekend getaway trip.

Many exhibitors offer "show specials" that are tempting even to the woodworker who thought he had everything. Don't be afraid to ask questions — or, if you're really interested, a hands-on demonstration. The exhibitors are extremely knowledgeable and usually more than happy to share their opinions, techniques, and tips.

In addition to all the seminars, you'll find many free brief demonstrations and workshops on the exhibit floor. All three principal sponsors charge \$5 admission; Woodworking World Shows and The Woodworking Show offer \$1 off that price if you bring their magazine advertisement offering the refund.

CALENDAR OF MAJOR TOOL SHOWS

Here's a listing of sponsors, upcoming shows, and where to write for more information. (Because show names are so similar, be careful to keep the shows straight.)

- **Woodworking World**, sponsored by the Woodworking Association of North America (WANA), currently offers nine shows a year with an average of 50 exhibitors per show. One-hour seminars throughout the day are included with admission to the show. A sampling of the seminars includes "Table-Saw Techniques" with Roger Cliffe and "Scroll Saw Use" presented by Wolfgang Derke. Two-hour lectures are \$20, with speakers such as noted cabinetmaker and furniture designer Ian Kirby. Day-long workshops (10:30 a.m. - 4:30 p.m.) also are offered for \$50.

For information, write:
Woodworking World, Woodwork-

ing Association of North America, P.O. Box 706, Route 3 and Cummings Hill Rd., Plymouth, NH 03264. Or call: 603/536-3876.

- **Upcoming shows:**
Stanford, Conn., Sept. 26-27-28; Chicago, Oct. 17-18-19; Charlotte, N.C., Nov. 21-22-23.
- **The Woodworking Show** sponsors eight shows a year with an average of about 100 exhibitors per show. You'll find free hour-long workshops throughout the day, ranging from decoy carving to routing. Seminars lasting 2½ hours and costing about \$25 run throughout the day. It's well worth the seminar fee to see and hear such furniture-making notables as James Krenov and Sam Maloof in person.

For information, write:
The Woodworking Show, 1516 South Pontius Ave., Los Angeles, CA 90025. Or call: 1/800-826-8257.

Upcoming shows:

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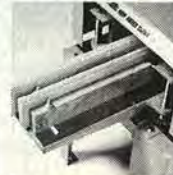
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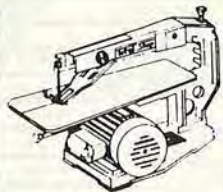
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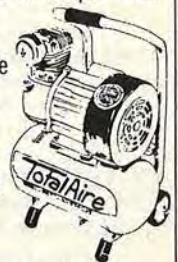
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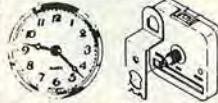
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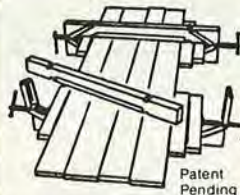
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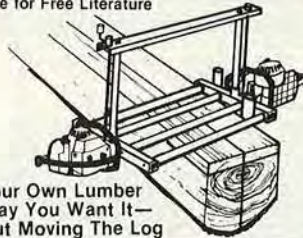
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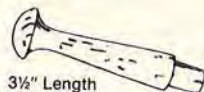
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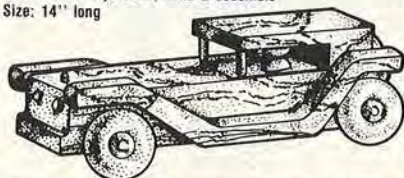
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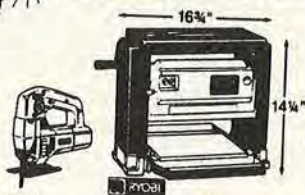
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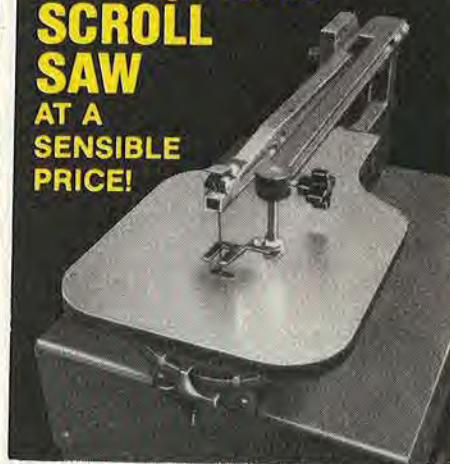
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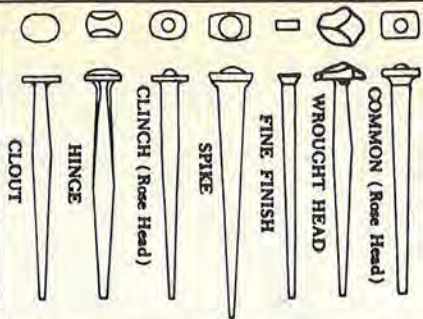
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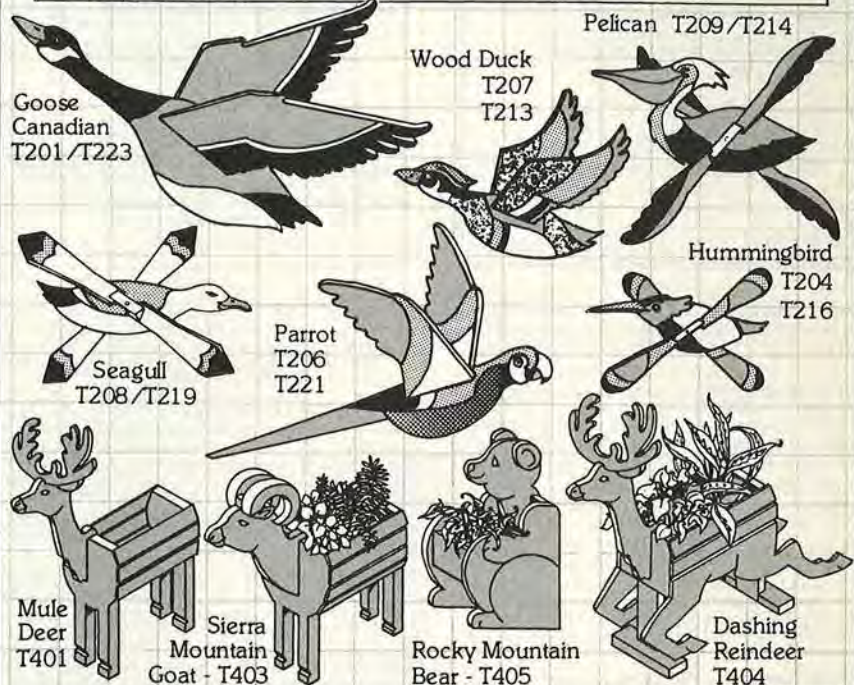
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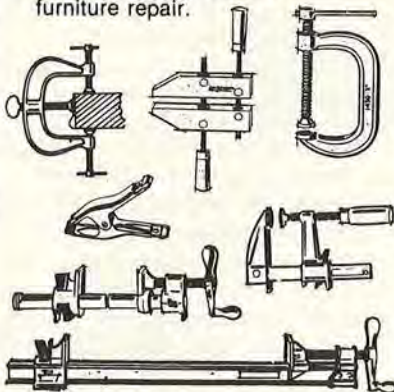
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"HOW TO WORK WITH LATTICE" — This 32-page book shows many traditional and untraditional uses for lattice wood moulding and alternative profiles. The many uses illustrated are for both interior and exterior application. Find such projects as accent walls, decks, fences, furniture trim, lighting fixtures, mail boxes, picture frames, room dividers, and many, many more. WOOD MOULDING AND MILLWORK. 75¢. Circle No. 2093.

"HOW TO FINISH WOOD MOULDINGS" — This brochure instructs the individual interested in applying a professional-looking finish to wood mouldings. The brochure explains the differences between paints, stains, clear finishes, and miscellaneous finishing products. Illustrations show how to finish new wood. Tools necessary to do a professional-looking job are also covered. WOOD MOULDING AND MILLWORK. 40¢. Circle No. 2094.

WOODWORKERS SUPPLY — Offers high quality tools and supplies for skilled, amateur, and professional woodworkers. Our complete catalog includes machinery, hand tools, plans, router bits, shaper cutters, wood specialties, and more. For your two year subscription send to WOODWORKERS SUPPLY OF NEW MEXICO. \$2.00. Circle No. 2125.

WOODWORKING ASSOCIATION OF NORTH AMERICA — First international association for woodworkers. Benefits include our quarterly magazine *International Woodworking*, specials from selected manufacturers, group health and life insurance, access to the woodworking network. WOODWORKING ASSOC. OF NORTH AMERICA. 50¢. Circle No. 2127.

QUALITY AMERICAN-MADE WOOD TURNINGS — such as shaker pegs, spindles, toy wheels, toy parts, craft items, and dowel rods in birch, oak, walnut, and cherry. Send for complete 32-page catalog. WOODWORKS. \$1.00. Circle No. 2130.

WOODWORKING MACHINERY CATALOG — Workbench Tool Co. is now offering the Powermatic 26 spindle shaper, 3 hp., 1 ph., 1/2 to 3/4 in. spindles, reversing switch for only \$1625 FOB. Send for catalog. WORKBENCH TOOL CO. \$2.00. Circle No. 2145.

PROJECT PLANS FOR WOODWORKERS — Professionally designed projects include furniture, playthings, and accessories, to more complex projects such as storage sheds and gazebos. These plans are designed using readily available materials, keeping in mind standard sizes of lumber. Instructions are clear and concise, and occasionally include tips that will make your job easier. Some plans have a cut-out materials list to take with you to the lumber yard. All plans are current, and we are constantly adding to our line. Order our catalog now and get started! THE WORKSHOP BLUEPRINT CO. \$2.00. Circle No. 2150.

EXOTIC HARDWOODS — Wyndham Woods offers the finest exotic hardwoods, precision cut and dried to our specifications at a modern European mill. As a direct importer we can offer substantial savings on such fine woods as padouk, mahogany, shedua, doussie, zebra wood, and many others, as well as domestic species and veneers. For the best wood at the best prices, send for our catalog. WYNDHAM WOODS, INC. \$1.00 (Refundable with order). Circle No. 2160.

IS THIS THE WORLD'S BEST JOINER-PLANER? — We think so and invite you to take a closer look! MiniMax's new FS-35 joiner-planer combines industrial quality with an affordable price that will appeal to professionals and amateurs alike. THE XYLOPHILES CO. \$1.00. Circle No. 2170.

DOOR SHOP® MANUAL AND CATALOG — The 37-page Door Shop® manual is clearly written and beautifully illus-

trated with over 150 detailed drawings covering the complete process of door building. Each section covers proper methods and exact set-ups for the router, including how to recognize and correct for errors. There are sections covering design, lumber selection, measuring, panel raising, rail and stile fitting, guides, clamping, gluing, and finishing. This is the most comprehensive manual out today. When you purchase the Door Shop® manual for \$5.00 you also receive Zac's 26-page router bit and shaper cutter catalog free. And as an extra bonus you receive a hardwood door corner sample with your catalog order. \$5.00 rebated with purchase. ZAC PRODUCTS INC. \$5.00. Circle No. 2195.

MAKING WHIRLIGIGS AND OTHER WIND TOYS, S. Pierce — Practical! Find out how to get the wind to hit them right, balance the paddles. Make 3 different kinds of whirligig arms, 22 patterns: soldier, mermaid, penguin, Santa, unicorn, and more plus wind toys — windmills, racing jockeys, and even a tireless fellow milking an endlessly patient cow. 4 pages in color, 132 pages 7 1/2 x 9 1/2. STERLING PUBLISHING CO. \$8.95. Circle No. 2250.

OUTDOOR PLAYHOUSES AND TOYS — Projects and Plans, Staff of *Workbench* magazine. From the pages of *Workbench* instructions for making classic toys, child-safe, many never in a book before. Every project has finished photo. Extensive over-sized plans for entire playground set, kiddie cars, sleighs, scooters, wagons, doll houses, cradles, 53 more. 112 pages, 8 1/2 x 11, many photos and diagrams. STERLING PUBLISHING CO. \$7.95. Circle No. 2251.

MAKING WOOD BANKS, Harvey E. Helm — 38 different coin banks, some even have cleverly hidden closure plugs. Easy-to-follow patterns include a whale, penguin, owl, camera, doll, football helmet, plus many others. 128 pages, 6 1/2 x 8 1/4. STERLING PUBLISHING CO. \$6.95. Circle No. 2252.

TABLE SAW TECHNIQUES, R. Cliffe — Essential bench reference. Every model blade accessory techniques plus maintenance, sharpening, etc. Learn basic advanced cuts, mitering, joinery problem solving, special set-ups. Projects: picture frames, nightstands, clocks, trunks, chests, and much more. 352 pages, 8x10, over 700 photos and detailed line drawings. STERLING PUBLISHING CO. \$14.95. Circle No. 2253.

MAKING ROCKING HORSES, A. Dew — Illustrated step-by-step directions, scale plans, cutting lists for simple hobby horses through true rocking horses include basic joinery, turning, carving leather and metal work (for saddle bits), painting, finishing, restoration. 128 pages, 5 3/4 x 9 3/4, 100 photos, 50 illustrations. STERLING PUBLISHING CO. \$9.95. Circle No. 2254.

BLIZZARD'S WONDERFUL WOODEN TOYS, Richard Blizzard — From a 1907 Rolls Royce that's 3 feet long to a truck with a working fork lift — there are full-color photos, step-by-step instructions and detailed cutting lists, for the more than 30 projects. 134 pages of extravagantly detailed plans. 48 photos (9 in color), diagrams, 224 pages, 8 1/4 x 11 3/4. STERLING PUBLISHING CO. \$9.95. Circle No. 2255.

MAKING FOLK TOYS AND WEATHER VANES, S. Pierce — Classic running horse weather vane, miniature rocking horse, and many others. Simple wood projects and patterns that have a real Colonial look. Explicit instructions for pattern making, cutting, drilling, sanding, staining, assembly, painting, more. 112 pages, 7 1/2 x 9 1/2, 20 photos, patterns. STERLING PUBLISHING CO. \$7.95. Circle No. 2256.

WOOD FINISHER'S HANDBOOK, S. Allen — State-of-the-art! 150 photos and drawings show how to prepare new wood by hand and machine, repair imperfections, revive old finishes, stripping using stains, plus the new two-part finishes. Includes new products, treating difficult woods, wood graining, stenciling, and more. 192 pages, 8x10. STERLING PUBLISHING CO. \$9.95.

MAKING WOOD SINGS, Patrick Spielman — Heavily illustrated. Covers basic handcarved signs, cutout or sawn letters, routed signs. Included are tips, shortcuts, and advice on subjects of design, material selection, tools, machines, finishing, project ideas. 144 pages, 6 1/2 x 8 1/4. STERLING PUBLISHING CO. \$7.95. Circle No. 2258.

ROUTER HANDBOOK, P. Spielman — Author of *Making Wood Signs*. The definitive book on the router, which has done more to revolutionize the craft of woodworking than any other tool. Including step-by-step techniques for every operation, information on accessories and gadgets to expand the router's usefulness, patterns and instructions for dozens of handsome projects. 600 photos and illustrations, 224 pages, 8x10. STERLING PUBLISHING CO. \$9.95. Circle No. 2259.

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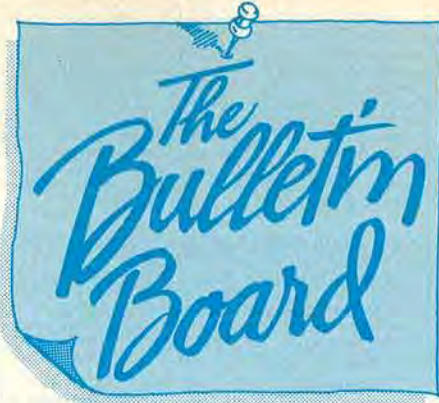
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FORESTS UNDER SAIL



Building sailing ships in the mid-18th century consumed incredible quantities of oak. A 74-gun warship required the equivalent of 3,700 oak trees. A 100-gun ship needed an 80-acre forest!



FACTS, FACES & FABLES
OF INTEREST TO HOME WOODWORKERS

TOP TURNERS LAUNCH NEW ASSOCIATION

If tool collectors, carvers, and exotic wood enthusiasts can have associations, why not woodturners? That's what David Ellsworth, Dale Nish, Bob Stockdale, Del Stubbs, Rude Osolnik, and other top turners asked themselves a year ago when they formed the American Association of Woodturners (AAW).

You don't have to be a professional turner to join. Membership now totals about 1,000 artisans, tool and equipment suppliers, gallery owners, collectors, and hobbyists. Members are united by their fondness for woodturning, desire to learn more about it, and willingness

to promote it as an art and craft.

So far, AAW, which operates on a nonprofit basis, has developed a newsletter, a quarterly journal called the *American Woodturner*, and several directories. The guides list sources for wood and tools, galleries featuring turnings, and instructors and demonstrators. With all the talent AAW has on tap, the learning potential should be high.

For more information, write: *American Association of Woodturners, Dept. W, P.O. BOX 982, San Marcos, TX 78667, or phone 512/396-8689 (annual membership is \$15).*

FEUDAL FIREWOOD

In feudal England, peasants were allowed to gather only downed wood, or dead wood from standing trees that they could reach with a

hook or a crooked shepherd's staff. They got their wood by "hook or crook," and the saying still credits their resourcefulness.

HOMER FORMBY: REFINISHING'S DOWN-HOME ANSWER MAN

"Shucks, you don't have to go to all that work," Homer Formby, 62, sometimes responds to an oft-asked question. "Lots of old furniture simply doesn't need refinishing."

He sounds absolutely convincing,

When it comes to refinishing, Homer Formby aims to tell it like it is.



even when you know his business is selling Formby furniture finishing and refinishing products. It might be that, like most of us, Homer really doesn't look forward to refinishing furniture. At least, not unnecessarily.

At age nine, in Florida, Homer worked after school in his father's antique and furniture refinishing shop. By the time he was 40, Homer had his own shops.

To speed up the refinishing process, he set about developing a formula that was not only fast, but easier and safer. In 1969, his new furniture refinisher reached the public.

Today, Homer directs the busi-

AROUND THE NATION

Heart of Dixie Woodcarving Show, Sept. 19-21. Montgomery Mall, Montgomery, Ala. Third annual show and sale sponsored by P-M Chippers, the area's woodcarving club. Phone 205/272-7503.

Ohio Duck Hunters Decoy Contest, Sept. 28. Magee State Wildlife Area, State Rt. 2, Oak Harbor, Ohio. Exhibition of decorative and functional decoy carvings, sales. Write Robert Lund, 140 Southwood Dr., Perrysburg, OH 43551.

Mid-West Tool Collectors Fall Meeting, Oct. 9-11. Holiday Inn South, Louisville, Ky. From barbed wire stringers to double-claw hammers, old tools will be everywhere. Seminars on specific areas of collecting and use. Members only (join at door for \$15). For details, contact Gale Zerkle, 511 Cookston Ave., Springfield, OH 45503.

Note: For a listing of woodworking shows usually found in this column, see the article, "Woodworking Tool Shows" on page 96.

CHEMISTRY, NOT JACK FROST, CREATES FALL COLOR

Two chemical phenomena cause leaves to change color. Carotenes and xanthophylls are yellow pigments that leaves have all summer, but green chlorophyll pigments hide them. Cold destroys the chlorophyll and yellow emerges.

Reds and purples come from pigments called anthocyanins, produced by sugar in the sap. Lower temperatures and short daylight hours cause them to build up in the leaves.

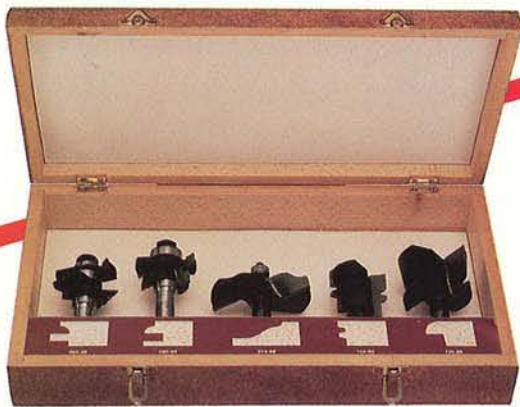
ness from Olive Branch, Mississippi. Formby products are promoted in national magazines, on television, and stocked in 30,000 stores.

Homer still advises you not to refinish if you don't have to:

- "Just lift off embedded dirt with a good cleaner, then rub in lemon oil to bring out the luster."
- "Test to see if you need paint remover by dabbing a spot on an unblemished area of finish with a cotton ball moistened with fingernail polish remover. If the ball sticks, use refinisher. If it won't soften, use paint remover."

You can send refinishing questions to Homer at *Dept. W, P.O. Box 667, Olive Branch, MS 38654.*

NEW FROM **freud**® FOR...



ROUTING

Freud's new 5 piece router bit door system allows you to produce raised panel cabinet doors with your 1/2" chuck router. Each bit is made with the finest carbide available and sharpened with a 600 grit diamond wheel.

The bit profiles are: rail and stile , raised panel door lip , glue joint . The bits come in a wooden box jointed case for ease of storage. As a set, the 94-100 list for **\$24800** Sale Price **\$19900**



SHAPING

Freud's new 5 piece cabinet set for the 3/4" - 1/2" shaper comes with rail and stile, raised panel, door lip and glue joint cutters. A box jointed wooden case is included for ease of storage and prevention of damage.

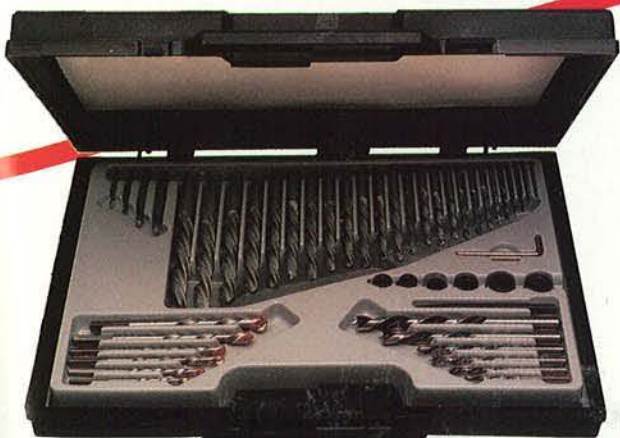
The cutter profiles are: rail and stile , raised panel door lip , glue joint . The cutters are made with the highest of manufacturing standards and materials. If purchased individually, they would cost \$510.00. As a set, the EC-900 list for **\$44900** Sale Price **\$34900**



BORING

Freud's new 16 piece Forstner bit set comes in a box jointed wooden storage case. These bits, guided by their rim, will create a clean flat bottom hole in wood. A special heat treated steel is used in their production to assure long lasting edges.

The 16 bits range in size from 1/4" to 2 1/8" in 1/8" increments. These bits will fit any stationary or portable drill using a 3/8" or larger chuck. The FB-100 Forstner bit set list for **\$24900** Sale Price **\$19900**



DRILLING

Freud's new 50 piece drill bit set comes with a heavy duty carrying case for ease of storage and protection. This set consists of: A) 25 high speed steel bits (1/16" - 1/2" in 1/16" increments) B) 4 high speed steel bits for use in sheet metal (1/4", 3/16", 1/8", 3/32") C) 6 chrome vanadium steel brad point bits for use in wood (1/8", 5/32", 3/16", 1/4", 5/16", 3/8") D) 6 carbide tipped masonry bits with hex shanks (5/32", 3/16", 7/32", 1/4", 5/16", 3/8") E) 1 center punch, 2 Allen keys and 6 depth stops to set bits at pre-determined depths.

These bits will fit any stationary or portable drill using a 3/8" or larger chuck. The DB-050 drill bit set list for **\$8900** Sale Price **\$6900**

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