

The Woodworker's Journal

Vol. 14, No. 6 \$3.95

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November/December 1990



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The Woodworker's Journal

NOVEMBER/DECEMBER 1990 VOLUME 14, NUMBER 6

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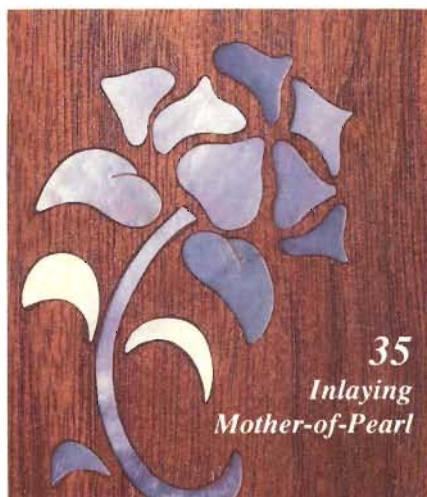
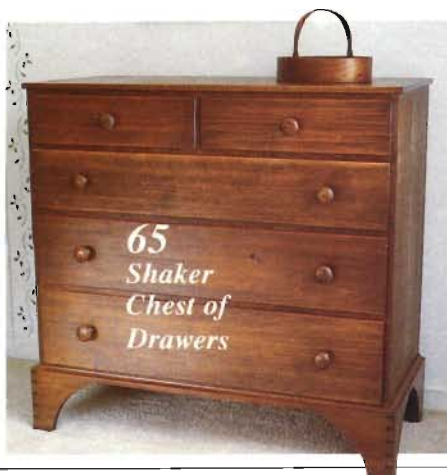
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Shoptalk

My Circulation Manager sometimes chides me for being too laid back when it comes to promoting the virtues of *The Woodworker's Journal*. "We don't blow our horn enough," she says, and she's probably right. As we start our 15th year of publishing, and consider the number of woodworking magazines that have appeared in the past few years, our continuing growth is no small achievement.

I've always preferred to believe that a product should be able to stand on its own merits, but today it also takes a lot of loud horn blowing to be heard above the increasing clamor of the competition. Promotion (and Phineas T. Barnum would have agreed) can be a key strategy.

With this in mind, I'd like to take the opportunity to sound a trumpet fanfare loud and clear by saying that *The Woodworker's Journal* is, and always has been, the magazine that provides a bigger selection of new projects per issue than any other woodworking periodical. Moreover, we continue to provide a range of projects designed for woodworkers of all skill levels, and we back up our plans with the techniques needed to build from them.

In this issue we have nine projects for you, from a simple bird feeder to a four-poster bed. We've always realized that our readers are extremely diverse, not only in the types of projects you prefer, but also in your levels of aspiration. There's no need for snobbery or elitism here. We all wish to excel in our craft, but I believe that personal satisfaction is really the bottom line. Whether you build beds or bird feeders; as long as you do the best you can and enjoy what you're doing, you are a woodworker and a productive person, and Heaven smiles on you!

Back Issue Sale

Each new issue we print adds to our back issue inventory and our warehouse is starting to bulge at the seams. We need more space, so I'm offering an unprecedented sale that will provide you with over 50 projects (six issues) plus lots of woodworking information for more than 50% off our regular back issue price. Some issues are in short supply and we've got to put a time limit on this sale, so if you're interested, check the details on page 72 and act soon! There's still time for making Christmas gifts. Work safely and above all . . . enjoy your woodworking.

The Woodworker's Journal

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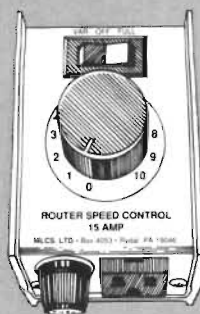
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#230		1/4" Round Over	1/4" R	1"	1/2"	1/4"	\$12.00
#353		5/16" Round Over	5/16" R	1 1/8"	1/2"	1/4"	\$14.00
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#205		1/4" Cove	1/4" R	1"	1/2"	1/4"	\$12.00
#206		3/8" Cove	3/8" R	1 1/4"	5/8"	1/4"	\$13.00
#207		1/2" Cove	1/2" R	1 1/2"	5/8"	1/4"	\$14.00
#208		3/4" Cove	3/4" R	1 7/8"	3/4"	1/2"	\$26.00
#460		1/4" Bull Nose	1/4" Dia. of Circle		3/8"	1/4"	\$14.00
#461		3/8" Bull Nose	3/8" Dia. of Circle		3/4"	1/4"	\$15.00
#462		1/2" Bull Nose	1/2" Dia. of Circle		7/8"	1/4"	\$16.00
#464		3/4" Bull Nose	3/4" Dia. of Circle		1 1/8"	1/4"	\$19.00
#506		1/2" Pattern	Flush Trim	1/2"	1"	1/4"	\$15.00
#507		5/8" Pattern	Flush Trim	5/8"	1"	1/4"	\$16.00
#508		3/4" Pattern	Flush Trim	3/4"	1"	1/4"	\$17.00
#366		1/8" Slot Cutter	3/8" Deep	1 1/4"	1/8"	1/4"	\$14.00
#368		1/4" Slot Cutter	3/8" Deep	1 1/4"	1/4"	1/4"	\$14.00
#204		3/8" Rabbeting	3/8" Deep	1 1/4"	1/2"	1/4"	\$13.00
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#211		3/8" Core Box	round nose	3/8"	3/8"	1/4"	\$10.00
#212		1/2" Core Box	round nose	1/2"	1 1/2"	1/4"	\$13.00
#418		3/4" Core Box	round nose	3/4"	5/8"	1/4"	\$15.00
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#215		3/16" Straight	plunge cutting	3/16"	1"	1/4"	\$ 6.50
#216		3/8" Straight	plunge cutting	3/8"	1"	1/4"	\$ 6.50
#217		7/16" Straight	plunge cutting	7/16"	1"	1/4"	\$ 6.50
#474		1/2" Straight	plunge cutting	1/2"	1"	1/4"	\$ 7.00
#775		1/2" Straight	plunge cutting	1/2"	2"	1/2"	\$14.00
#218		5/8" Straight	plunge cutting	5/8"	1"	1/4"	\$ 7.00
#219		3/4" Straight	plunge cutting	3/4"	1"	1/4"	\$ 9.50
#220		1" Straight	plunge cutting	1"	1 1/2"	1/2"	\$11.00
#500		3/8" Flush	Trimming	3/8"	1/2"	1/4"	\$ 7.00
#502		1/2" Flush	Trimming	1/2"	1/2"	1/4"	\$ 7.50
#503		1/2" Flush	Trimming	1/2"	1"	1/4"	\$ 8.50
#221		1/2" Flush	Trimming	1/2"	1 1/8"	1/2"	\$ 8.00
#545		Tongue & Groove	Straight	1 5/8"	1"	1/4"	\$29.00
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#546		Tongue & Groove	Wedge	1 3/8"	1"	1/4"	\$29.00
#846		Tongue & Groove	Wedge	1 5/8"	1"	1/2"	\$29.00
#450		1/8" Beading	1/8" R	3/4"	3/8"	1/4"	\$11.00
#451		3/16" Beading	3/16" R	7/8"	1/2"	1/4"	\$11.00
#233		1/4" Beading	1/4" R	1"	1/2"	1/4"	\$13.00
#453		5/16" Beading	5/16" R	1 1/8"	1/2"	1/4"	\$14.00
#454		3/8" Beading	3/8" R	1 1/4"	5/8"	1/4"	\$15.50
#455		1/2" Beading	1/2" R	1 1/2"	3/4"	1/4"	\$17.00
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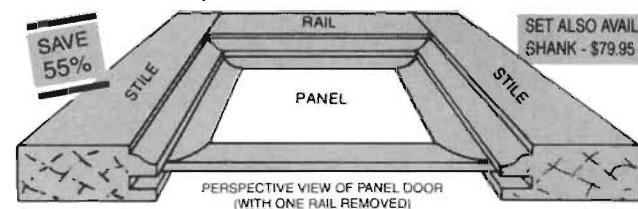
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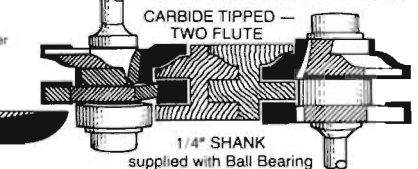
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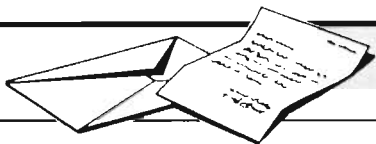


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Letters

In your September/October 1990 issue you have a plan for a Portable Tool Chest. In the finishing instructions you say to apply a coat of sanding sealer followed by two coats of polyurethane varnish. However, many manufacturers, including Sherman Williams and Pratt Lambert, specifically instruct not to use polyurethane over sanding sealer. What brands did you use?

Gerald G. Laukhue
Bowling Green, Ohio

Many polyurethane finishes are not compatible with sanding sealers, so it's important to read the labels before starting. However, the two we used work together just fine, and both are sold by True Value hardware stores. Use their Enrich Sanding Sealer (No. 015) and Enrich Satin Poly-Varnish (No. 039).

Your dovetail jig "Shop Test" in the September/October 1990 edition suffered, as do many such articles, from

some unevenly applied positive and negative connotations and "apples and oranges" comparisons.

Obviously, my vested interest is in the Leigh jig, but I am also concerned with accurate and even-handed reader information when comparing fine products such as Keller, Leigh, and Omni jigs.

Yes, of course, there is a longer learning curve with the Leigh and Omni jigs, they both complete many more types of joints than does the Keller. To say the Keller "setup procedure is far easier than the other jigs" is only collectively true, it certainly isn't so if comparing only the through-dovetail which is all the Keller does.

I am not sure why it took six attempts to get the correct depth of cut in half-blind dovetails when using the Leigh. Precisely the same setup (which takes most people 2-3 tries) is also required on every half-blind dovetail jig and template on the market. Particularly galling is that this is a router, and not a jig adjustment.

To go on to say "you will have to go through the procedure whenever you change variables such as drawer side thickness" is just not so.

In the section on the Keller template, there was one "important," even "huge benefit," implied as exclusive to the Keller which, in fact, is shared equally by both Leigh and Omni. The stock thickness on all three systems "can vary without any effect on how the joint fits."

Your readers will be interested to know that the Leigh also has a highly praised instructional video available, as provided for your reviewer, but not mentioned.

Kenneth M. Grisley
President
Leigh Industries, Ltd.

The dovetail jig tool review in your September/October 1990 issue listed an address for Sears that is out of date. Readers looking for more information about our dovetail template should write

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Jackie Bitowt
Sears, Roebuck and Co., Chicago, Ill.

I liked the Santa Fe style bench in your March/April 1990 issue. Are there any books available with plans or ideas for this style of furniture?

Paul Roozeboom, Knoxville, Iowa

We are not aware of any books that feature measured drawings of Santa Fe style furniture. However, the book New Mexico Furniture, 1600-1940, may be of interest to you. It contains some 300 photographs of authentic furniture from the Hispanic Southwest. Many of the photographs are in color. Overall dimensions of the furniture accompany each photograph. It is written and published by and available from the Museum of New Mexico Press, P.O. Box 2087, Santa Fe, NM 87503. The current price is \$48.39, shipping included.

In the "Letters" section of your July/August 1990 issue you described a procedure for determining the moisture content of wood. In the example given, the oven-dry weight of wood (10 grams) was used to calculate the percentage of moisture. I think you should have used the weight of the original sample (12 grams), which would have made the moisture content 16.7 percent, not 20 percent.

Warren Burger
Mt. Horeb, Wis.

Although a number of readers questioned us on this one, we are happy to report that the formula we used is correct. The confusion is understandable, though, as percentages are usually calculated in the manner you suggest. However, the moisture content of wood, as defined by the United States Forest Products Laboratory, is the weight of water in wood expressed as a percentage of oven-dry wood. This means, in some cases, wood can have a moisture

content of more than 100 percent. In fact, the moisture content in some trees may range from around 30 percent to as high as 200 percent.

I'd like to see *The Woodworker's Journal* shop-test some of the finishing sanders that are on the market.

R. L. Judd
San Diego, Calif.

We are preparing to shop-test several pad sanders for our March/April 1991 issue.

The Blue Mountain Woodworking Club was recently formed in Collingwood, Ontario, Canada. The members meet on the third Wednesday of each month at the Admiral Public School. New members are welcomed. For more information contact Glenn Carruthers, Box 795, Stayner, Ontario, Canada L0M 1S0; tel. (705) 444-1752. 

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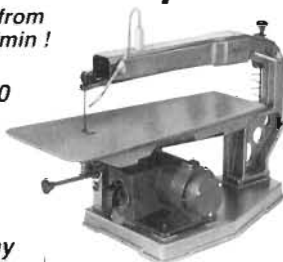
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Item #PKN **\$25.00/set** (•)

Dust Chute

For vacuum takeoff of wood chips.

#PDS .. (reg \$24), On Sale... **\$15** (UPS \$3)

Planer Stand (Heavy duty)

Drilled for Super 125 Planer. 27-1/4" High. #PST ... (Reg \$44), On Sale... **\$39/ea** (UPS \$6)

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HTC brand support stand w/heavy duty ball bearing roller. Height adjusts from 25" - 44". #PRS ... (reg \$40), On Sale ... **\$35** (UPS \$4)

Ball Bearing Rollers

(Minimum purchase 2 rollers). Build a roller stand, infeed/outfeed table etc. with these 13" X 2" Heavy Duty rollers. Includes **FREE** plans for roller stand shown above.

Item #BBR **\$6.50/ea** (\$3 UPS /order)

DC-1 Dust Collector

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Hose & Fittings)

On Sale ... **\$199.95**

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Keep your shop clean and safe from saw dust with this large capacity, commercial style system.

SPECIFICATIONS:

1HP • 110/220V (pre-wired 110V)
• 610 CFM air flow • 2 ea 20 gal bags
• 4" inlet • Castors on base • WT.: 75 lbs

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Dust collection hose • 4" to 3" rigid adaptor • 4" to 2" flex adaptor • Plans for 2 stage setup • Sources for accessories

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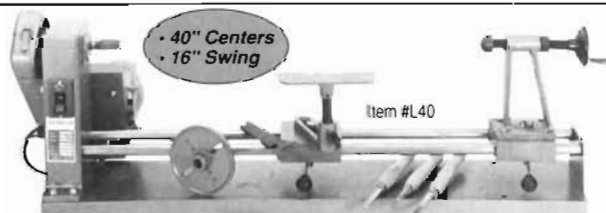
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Reg \$299.95, **On Sale \$249.95**

Includes **FREE** 8 piece Wood Chisel Set ... **\$34 Value**

Our new XL-40 Wood Lathe surpasses every lathe in its price range with quality & features you would expect from machines many times its price. **FEATURES**

Heavy Duty cast iron construction provides smooth turning action • **40" Centers • 16" Swing** for turning larger bowls • Smooth toolrest movement on 1" solid steel rails • **"Live" center** on tailstock • **Motor mounted for easy positioning** and belt changes • **Sturdy 52" steel base** mounts on table top or optional stand.

PURCHASE INCLUDES:

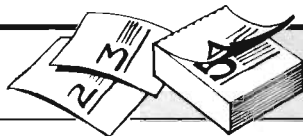
• Lathe with Motor & Base • Toolrest
• 6" Faceplate • 8 pc wood turning chisel set

SPECIFICATIONS:

• MOTOR: 1720 RPM. 1/2HP, 8AMP, 110V
• 3 Speeds: 660, 1500, 2850 RPM
• Headstock thread - 3/4" x 10 tpi
• Overall length: 60" • Weight: 100lbs
Item # L40 On Sale **\$249.95** (UPS \$20)

Lathe Stand

Heavy duty. Wt. 25Lbs
Size: 28"H X 56"L X 21" W
Item #LST **\$44/ea** (UPS \$6)



Events

We will gladly list as many events of interest to woodworkers as space permits. Listings are free and may include shows, fairs, competitions, workshops and demonstrations. The deadline is eight weeks before publication—November 5 for the January/February 1990 issue. Please address announcements to the Events Department. Readers planning on attending events should call ahead if possible. Scheduled dates and locations sometimes change between publication and the date of the event.

California:

The Woodworking Shows, Northern California, Nov. 9–11, San Mateo County Fairgrounds, San Mateo; Southern California, Nov. 30–Dec. 2, Long Beach Convention Center, Long Beach. For more information call 1-800-826-8257.

Connecticut:

Brookfield Craft Center Workshops: Nov. 3–4, 18th Century Woodworking Methods, Eugene Landon. For more information contact the center at P.O. Box 122, 286 Whisconier Road, Brookfield, CT 06804; tel. (203) 775-4526.

12th Annual Holiday Festival of Crafts, Nov. 3–Dec. 23; Songbird Carving

Workshop, Mary Worrilow, November 8–11. For more information write to Guilford Handcrafts Center, P.O. Box 589, Guilford, CT 06437; tel. (203) 453-5947.

Florida:

Juried show, Sixth Annual Fine Handcrafted Furniture Show, Feb. 6–16, Florida State Fair, Tampa. Open to Florida residents only. Entry deadline: Jan. 11. For information contact Lynn Keiter, 4536 West Kennedy Blvd., Tampa, FL 33609; tel. (813) 877-9585.

Massachusetts:

Woodworker's Alliance for Rainforest Protection (WARP), first official meeting, Nov. 16–18, University of Massachusetts, Amherst. For more information

contact John Shipstad, P.O. Box 133, Coos Bay, OR 97420.

Woodworking classes, The Boston Center for Adult Education, 5 Commonwealth Ave., Boston, MA 02116; tel. (617) 267-4430. Various classes throughout the year.

Worcester Center for Crafts, 25 Sagamore Road, Worcester, MA 01605. Woodworking classes throughout the year.

Michigan:

The Woodworking Shows, Metro-Detroit, Dec. 7–9, Cobo Hall, Detroit. For more information call 1-800-826-8257.

(continued on page 11)

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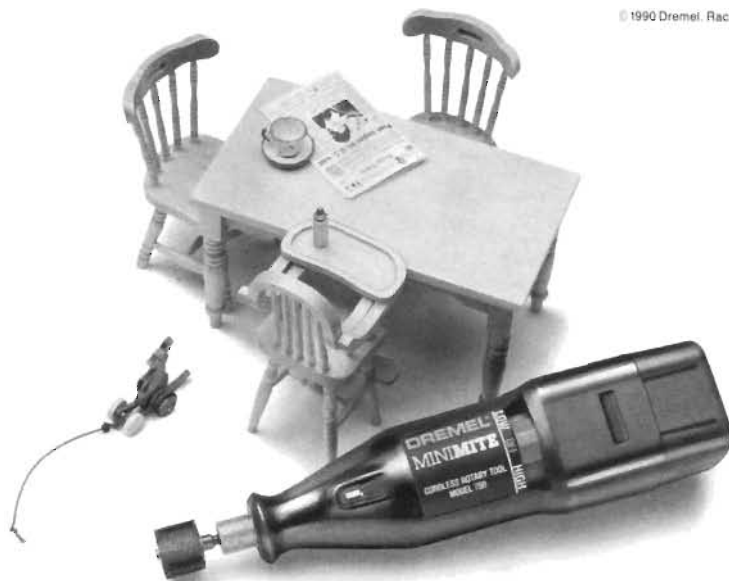
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	FT213	1/2	1	1/4	6.50
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	DV210	3/8	3/8	1/4	4.60
	DV213	1/2	1/2	1/4	4.60
	DV413	1/2	1/2	1/2	4.60
	DV419	3/4	7/8	1/2	6.50
	DV425	1	7/8	1/2	7.50
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	CB210	3/8	5/16	1/4	9.00
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	RO204	5/32	15/32	1/4	15.00
	RO206	1/4	3/4	1/4	16.00
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	CV203	1/8	3/8	1/4	11.00
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	CV419	3/4	3/4	1/2	25.00
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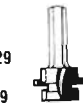
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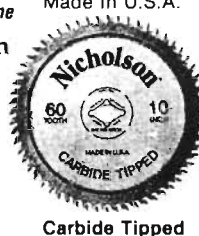


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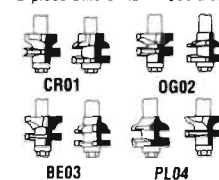
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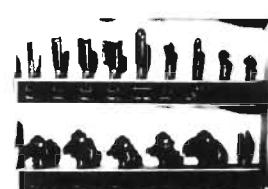
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Woodworking World, The Grand Rapids Show, Jan. 25-27, Stadium Arena, Grand Rapids. For more information call 1-800-521-7623.

New Jersey:

South Jersey Wood Carvers 5th Annual Fall Show, Nov. 10-11, Mt. Holly National Guard Armory. For more information call (609) 829-8731.

New York:

Woodworking World, The Central New York State Show, Nov. 3-4, New York State Fairgrounds, Syracuse; The Albany Show, Nov. 9-11, New Scotland Ave. Armory, Albany; The Long Island Show, Jan. 18-20, Hofstra University, Hempstead. For more information call 1-800-521-7623.

Ohio:

Woodworking World, The Columbus Show, Jan. 11-13, Veterans Memorial Hall, Columbus. For more information call 1-800-521-7623.

Oregon:

Oregon School of Arts and Crafts, Fall Workshop: November 10-11, Design, Production, and Marketing of Fine Furniture, Thomas Moser. For more information contact the school at 8245 S.W. Barnes Road, Portland, OR 97225; tel. (503) 297-5544.

Pennsylvania:

Woodworking World, The Central Pennsylvania Show, Nov. 16-18, Pennsylvania Farm Show Complex, Harrisburg. For more information call 1-800-521-7623.

Tennessee:

Woodturning: Vision and Concept II, a juried exhibition, Oct. 24-Dec. 8., Arrowmont School of Arts and Crafts, Box 567, Gatlinburg; tel. (615) 436-5860.

Virginia:

Woodworking World, The Virginia

Show, Jan. 4-6, Norfolk Scope, Norfolk. For more information call 1-800-521-7623.

Washington:

The Woodworking Shows, Western Washington, Nov. 16-18, Seattle Center, Seattle. For more information call 1-800-826-8257.

Northwest Carver's Association, 10th Annual Woodcarving Show, Nov. 10-11, Western Washington Fairgrounds Expo Hall, Puyallup. For more information call (206) 564-3278.

Wisconsin:

Furniture Restoration Workshops. Two-day programs, November 1-2; November 12-13; and December 6-7. There is no charge for the workshops. For more information write to the Minuteman Institute, 115 North Monroe Street, Waterloo, WI 53594 or call 1-800-733-1776. 

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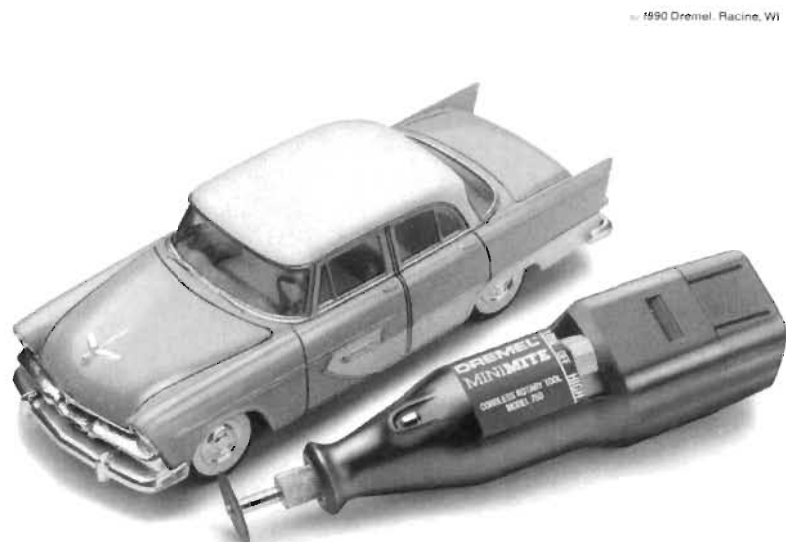
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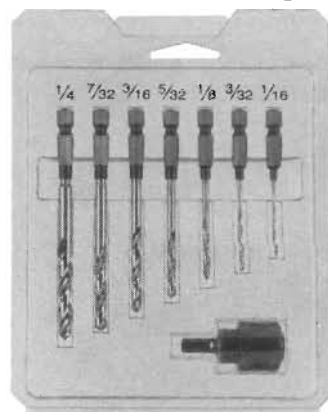
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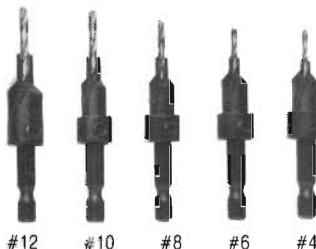


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Readers' Information Exchange

Looking for an owner's manual for an old hand saw? Need a bearing for a hand-me-down table saw? Can't find a source of supply for an odd piece of hardware? Maybe our readers can help. Send along your request and we'll try to list it here—and perhaps one of our readers will have an answer for you. Due to space limitations, we'll be unable to list all requests, but we'll include as many as we can.

I need an owner's manual and parts list for a Craftsman table saw model no. 113.29960.

Kent Davis
1106 S.W. 34th Terrace
Palm City, FL 34990

I'm looking for an owner's manual and parts list for a Craftsman wood shaper, model no. 103.23922.

Bob Myczkowiak
4153 Hackberry
Bridgeport, MI 48722

I'm looking for owner's manuals and parts lists for a Rockwell-Delta 14 in. band saw, model no. 28-300, and a Sears scroll saw, model no. 103.23440.

Frank A. Wudinich
9 East Parkway
Virginia, MN 55792

I need an owner's manual and parts list for a Craftsman radial-arm saw, model no. 113.29510. I will gladly pay charges for any copying, etc.

Vance L. Layton
13417 Bracken St.
Arleta, CA 91331

Where can I find plans for a full-size operational spinning wheel?

William F. Kyle
4009 Guadalupe Creek Rd.
Mariposa, CA 95338

Can your readers help me locate an owner's manual and parts list for a Montgomery Ward Powr-Kraft lathe, model no. TMG 2020A?

Robert Christensen
3440 Drake Dr.
Santa Maria, CA 93455



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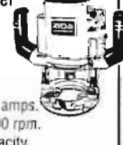
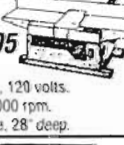
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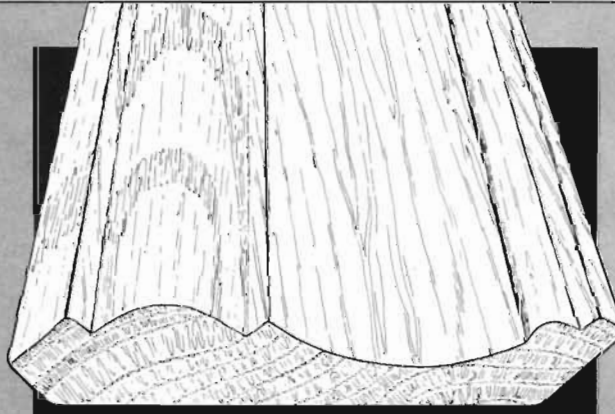
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8-1/4" Portable Radial Arm Saw  \$259.95 #RA200 •11 amp motor. •5/8" arbor. •5,000 rpm	3" X 21" VS Electronic Belt Sander  \$139.95 #BE-321 •5.4 amp motor. •Six settings. •775-1148 (spfm) speed.	2-1/4 HP Plunge Router  \$149.95 #R500 •13.3 amps. •22,000 rpm. •1/2" collet capacity.
3 HP Electronic Plunge Router  \$209.95 #RE-600 •115 volts, 15 amps. •10,000 -20,000 rpm. •1/2" collet capacity.	10" Miter Saw  \$179.95 #TS25IU •12.5 amps. •5/8" arbor. •5,000 rpm.	9.6 Volt Torque Force Cordless Driver Drill Kit  \$159.95 #TFD170VRK •3/8" keyless chuck •0-400/0-1200 rpm •6 position clutch.
10" Table Saw  \$299.95 #BT2500 •13.8 amps. •4,500 rpm. •0-45° table tilt to the left.	6-1/8" V. S. Jointer  \$319.95 #JP-155 •10.5 amps, 120 volts. •8,000-16,000 rpm. •6-1/8" wide, 28" deep.	3/4 HP Laminate Trimmer  \$89.95 #TR-30U •3.8 amps. •29,000 rpm. •1/4" collet capacity.

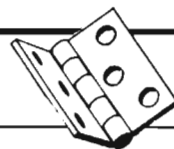
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Cabinetmakers' Supplies

Stationary Equipment Suppliers

As a service to our readers, *The Woodworker's Journal* periodically lists sources for various woodworking products. In this issue, we are listing companies that specialize in mail-order sales of stationary woodworking equipment, along with a code to indicate some of the equipment they carry. Codes: belt/disk sander (BDS), bench grinder (BG), band saw (BS), drill press (DP), jointer (J), lathe (L), multi-tool (MT), shaper (S), scroll saw (SS), thickness planer (TP), table saw (TS). This is by no means a complete listing, and we hope to include additional companies in the future.

Advanced Machinery Imports Ltd. . . . BG, BS, J, L, MT, S, SS, TP, TS
 P.O. Box 312, Dept. 347
 New Castle, DE 19720
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American Machine & Tool Co. . . . BDS, BG, BS, DP, J, L, S, SS, TP, TS
 4th Ave. & Spring St.
 Royersford, PA 19468
 Catalog free

Ashman Technical Ltd. . . . BDS, BG, BS, DP, J, L, MT, S, SS, TP, TS
 351 Nash Road N.
 Hamilton, Ontario
 Canada L8H 7P4
 Catalog free

Emco-Maier . . . BDS, BS, J, L, MT, S
 2757 Scioto Pkwy.
 Columbus, OH 43221
 Catalog free

Foley-Belsaw Co. . . . BDS, BG, BS, J, MT, S, SS, TP, TS
 6301 Equitable Rd.
 Kansas City, MO 64120
 Catalog free

Grizzly Imports . . . BDS, BG, BS, DP, J, L, S, SS, TP, TS
 P.O. Box 2069, Dept. WJ
 Bellingham, WA 98227
 Catalog free

Shopsmith, Inc. . . . MT, BS, DP, J, L, S, SS, TP, TS, BDS
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Treatise on Stairbuilding and Handrailing (Mowat) \$21
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Identifying Wood (Hoadley) \$29

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Woodjoiner's Handbook (Allen) \$14

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Sam Maloot, Woodworker \$38 (soft)
Contemporary American Woodworkers \$28
Tage Frid Teaches Woodworking-Books 1, 2, or 3 \$20 ea. All for \$57
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Artistic Woodturning \$17
Master Woodturners \$19. All 3 for \$46
James Krenov - 4 Titles \$14 ea. All 4 for \$52
Roy Underhill - 3 Titles \$12 ea. All 3 for \$35

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Band Saw Handbook (Duginskel) \$18
The Bandsaw Book (deCristoforo) \$16
Biscuit Joiner Handbook (Foster) \$14
Router Jigs & Techniques (Spielman) \$14
Sainsbury's Router Workshop \$29
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The Complete Book of Portable Power Tool Techniques (deCristoforo) \$14
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The Portable Router Book (deCristoforo) \$14
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Cabinetmaking (Calhoun) \$31

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Chiffe-Radial Arm Saw-Book & Video \$44
Rick Butz-2 Carving Books & Video \$55
Sam Maloot-Woodworking Book & Video \$64
Savage-Trim Carpentry Book & Video \$44
Frank-Wood Finishing Book & Video \$50
Barton-2 Chip Carving Books & Video \$45
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Trouble Shooting and Repairing Power Tools (Davidson) \$17
Woodturning for Cabinetmakers (Dunbar) \$14
Victorian Scroll Saw Patterns (Spielman) \$12

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Making Small Wooden Boxes (Jacobson) \$9.50
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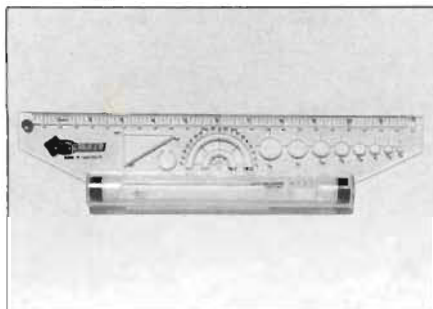
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Making Whirligigs & Other Wind Toys (Pierce) \$9
Making Classic Cars in Wood (Hicks) \$10
Making Dinosaur Toys in Wood (Wakefield) \$12

Product News

To keep our readers up-to-date, this column features brief descriptions of new tools and supplies on the market. The product descriptions are provided by the manufacturer and are not a result of tests or reviews by the editors of *The Woodworker's Journal*.

The Wizard

A single time-saving instrument that combines a ruler, circle and semi-circle templates, protractor, T-square, angles, compass and more. With the exclusive "tracking wheel" assembly, all of the



Wizard's functions can be performed on smooth surfaces such as wood, plastic laminate, sheetrock, glass, etc. Price for the Wizard is \$19.95 plus \$3.50 shipping and handling. For more information, contact The Wizard, 883 Cape Haze Lane, Naples, FL 33962; (813) 643-0696.

Dremel Model 750 MiniMite

Dremel's new MiniMite Model 750 compact cordless rotary tool provides its users with pinpoint accuracy for precision woodworking, woodcarving, refinishing, model building and other detail-oriented craft projects. The lightweight Model 750 features two-speed operation, 5,000 and 10,000 RPM, and is powered by a 4.8 volt motor and a three-hour rechargeable, replaceable battery pack consisting of four nickel cadmium batteries. It boasts a run time of up to one hour (depending on application) and with an additional battery



pack, down-time is nearly eliminated. The tool will accept standard Dremel collets and Dremel bits sized 1/32 in. to 1/8 in. diameter. The Model 750 comes complete with five precision tool bits, a removable battery pack and the three-hour wall-mounted charging unit. Write to Dremel, 4915 21st Street, Racine, WI 53406-9989.

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shaft, five spare Velcro faces and fifty 2 in. abrasive disks in grits ranging from 60 to 400. Price is \$33.50 postpaid. For more information, contact Albert Con-

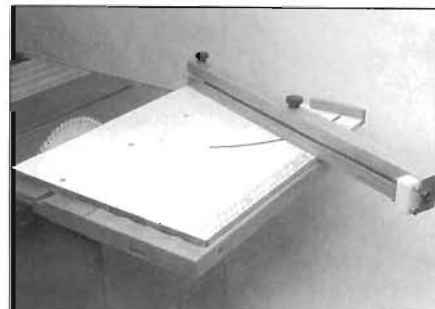
stantine & Son, Inc., 2050 Eastchester Road, Bronx, NY 10461; tel. (212) 792-1600.

Insty-Bit

Change drill bits almost instantly with the Insty-Bit system. You don't need a chuck key. The system consists of the Insty-Bit chuck (which attaches to your drill) and an assortment of hex drive accessories. The accessories include 1/16 in. through 1/4 in. diameter twist drill bits, 7/16 in. through 1 in. diameter spade bits, countersinks, screwdriver bits, nut-setters and more. To attach a drill bit (or any accessory), simply slide back the chuck sleeve, insert the bit, then release the sleeve. The bit is locked in place and ready to use. The system can also be used with a drill press. Chucks range in price from \$11.95 to \$16.95. For more information and prices on accessories, contact Poly-Tech Industries, P.O. Box 29207, Brooklyn Park, MN 55429; 1-800-334-7472.

Dubby Cutoff Fixture

The Dubby Cutoff Fixture improves table saw accuracy by replacing your saw's miter gauge with a fixture that includes a sliding stopblock and an infinitely adjustable swing arm. Placing the angle markings on a scale at the perimeter of the fixture table greatly



improves the accuracy, compared to a standard miter gauge. Once set up, tasks such as 22 1/2-degree angles for octagons become routine and repeatable. For more information, contact In-Line Industries, 661 S. Main St., Webster, MA 01570; tel. (508) 949-2968.



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1/4-20 x	40mm	13mm	\$ 1.31	\$ 4.54	\$ 7.27
1/4-20 x	50mm	13mm	\$ 1.31	\$ 5.08	\$ 8.12
1/4-20 x	60mm	13mm	\$ 1.62	\$ 6.10	\$ 9.77
1/4-20 x	70mm	13mm	\$ 1.76	\$ 6.78	\$ 10.84
1/4-20 x	80mm	13mm	\$ 1.91	\$ 7.55	\$ 12.08
1/4-20 x	90mm	13mm	\$ 2.10	\$ 8.50	\$ 13.60
1/4-20 x	100mm	13mm	\$ 2.27	\$ 9.34	\$ 14.94
1/4-20 x	110mm	13mm	\$ 2.35	\$ 9.79	\$ 15.67
1/4-20 x	120mm	13mm	\$ 2.89	\$ 12.43	\$ 19.88

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INSIDE THREAD	PKG. 25	PKG. 100	PKG. 500
8-32	\$1.40	\$ 5.60	\$26.00
10-24	\$2.42	\$ 8.80	\$37.00
1/4-20	\$2.42	\$ 8.80	\$37.00
5/16-18	\$3.20	\$12.00	\$48.00
3/8-16	\$3.20	\$12.00	\$48.00

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MADE IN U.S.A., ZINC PLATED



INSIDE THREAD	PKG. 25	PKG. 100	PKG. 500
8-32	\$1.48	\$ 5.12	\$22.40
10-24	\$1.48	\$ 5.12	\$22.40
1/4-20	\$1.72	\$ 6.08	\$26.60
5/16-18	\$2.60	\$ 9.60	\$42.00
3/8-16	\$2.60	\$ 9.60	\$42.00

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PB03	8 X 1 1/2	\$ 2.68	\$10.59	\$16.64
PB04	8 X 2	\$ 3.56	\$14.69	\$21.15
PB05	8 X 2 1/2	\$ 4.80	\$20.78	\$28.85
PB06	8 X 3	\$ 5.65	\$24.88	\$33.36

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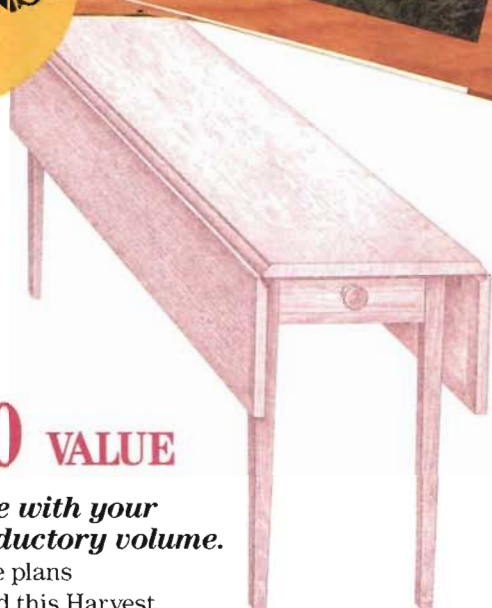
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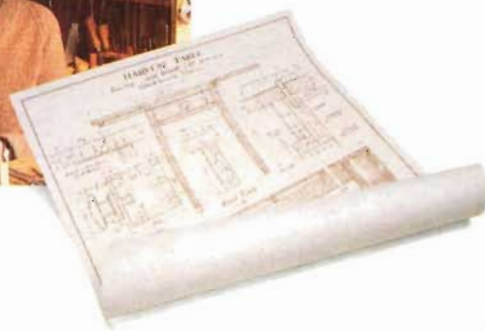
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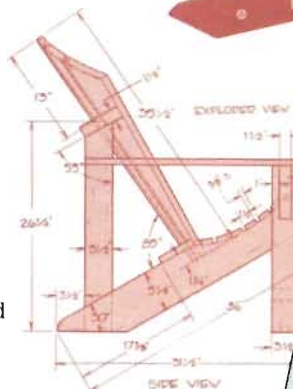


A—Adirondack chairs are timeless and attractive. See page 116 for complete details on building one for *your* yard.



B—For courting or contemplation, this contoured porch swing will turn any house into a country home. See page 24.

C—This garden bench, with its gently curving arms, gives you a comfortable place from which to enjoy the beauty of your yard. Step-by-step details start on page 54.



Materials List

PARTS

A. Back legs (2)	1 1/2" x 5 1/2" x 30"
B. Front legs (2)	1 1/2" x 3 1/2" x 28 1/2"
C. Back slats (2)	1 1/2" x 3 1/2" x 28 1/2"
D. Seat slat	1 1/2" x 3 1/2" x 20 1/2"
E. Upper back support	1 1/2" x 5 1/2" x 28"
F. Arms (2)	1 1/2" x 3 1/2" x 30"
G. Arm braces (2)	1 1/2" x 2 1/2" x 21"
H. Lower back support	1 1/2" x 5 1/2" x 28"
I. Back slats (7)	1 1/2" x 3 1/2" x 28 1/2"
J. Seat slat	1 1/2" x 3 1/2" x 20 1/2"
K. Side rails (2)	1 1/2" x 3 1/2" x 28 1/2"

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You can scribe the arcs on the back supports and seat slat with a compass made from a yardstick and a compass. A compass is nothing more than a long, thin board with a wooden yardstick a few inches longer than the board. Put a sharp point in the board at the hole in the compass. Put a sharp point in the board at the hole in the compass. Measure along the board from the sharp point to the second hole. Then swing the arc.



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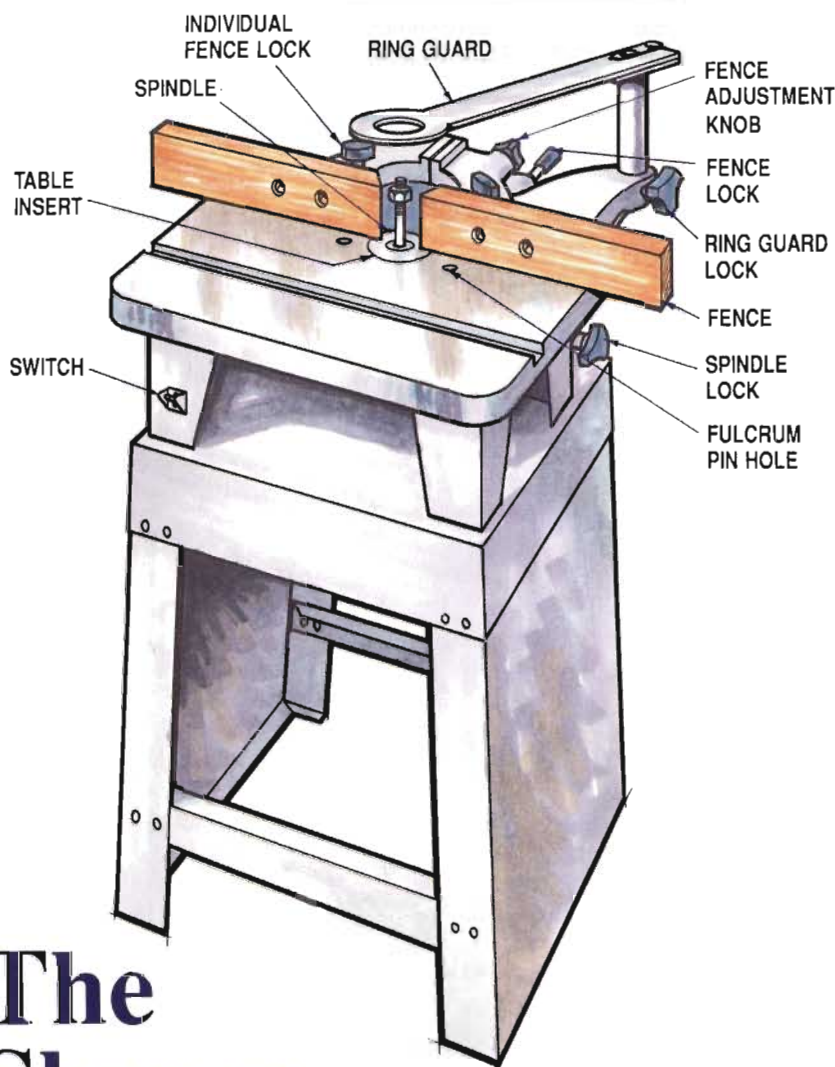
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The Shaper

By R.J. DeCristoforo

Check any home, and its contents, and you will discover a multitude of structural and decorative details that were produced by shaping operations. The commercial components were probably extruded by an industrial machine, usually called a "sticker," but it's exciting to know that duplication is possible even in a small home shop because of the availability of smaller tools called spindle shapers.

The tool is often erroneously labeled as one for professionals or is categorized, as the portable router often is, for decorative cuts only. Maybe it's the name "shaper" that throws us since it's almost a synonym for "decorative" which, in woodworking parlance, might

be thought of as non-essential embellishment.

Embellishments like fancy edges on case and table tops, or structural and decorative moldings, have their place and a shaper can be used to produce them in unlimited variety, but the tool's repertoire doesn't shun practicality. Think about chores like precise lips on cabinet doors, sharp edged tenons, graceful hinged joints on drop-leaf tables, expert production of paneled doors like the example in Photo 1, and a more realistic view of a shaper emerges.

Many woodworkers use a router table to produce the same kinds of cuts as a shaper. And in recent years, there's been an explosion in the number of router bits

available, so you may ask: Why buy a shaper? There are two reasons: versatility and ruggedness. Although router bits can duplicate most shaper operations, the design of the shaper allows more flexibility. For example, shaper cutters are stacked on a fairly long spindle, so you can arrange them to produce many different molding designs from the same cutters. You can do somewhat the same thing by changing router bits, but that requires multiple passes. Also, shapers have a built-in fence system that allows

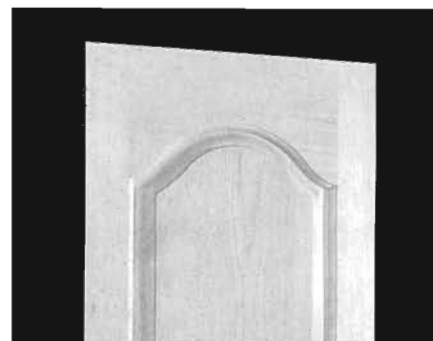


Photo 1

you to adjust the infeed fence separately from the outfeed fence. So the shaper can be used to joint edges and cut perfectly machined glue joints.

Besides increased flexibility, the shaper offers a step up in the scale of work from a router table. If you're planning on putting a half-round nosing on a set of stair treads, for instance, the shaper gives you the power to do it easily without straining the machine. Ease of use usually translates into safer operation.

The shaper opens new horizons. While you might have been designing frames for paneled doors with tenoned rails and grooved stiles since they are easy to do on a table saw, you might advance to more professional coped joints since they are also easy to do—but on a shaper. Easy is a relative term. Once the setup is arranged, the machine does the work, but the results depend on the operator's diligence when organizing cutters in relation to the workpiece. This is especially true when mating shapes are required on connections. The unique lock miter cutter makes a precise joint but only when the wood/cutter relationship during the shaping is correct (Photo 2).

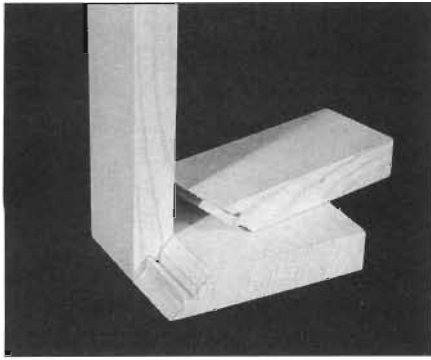


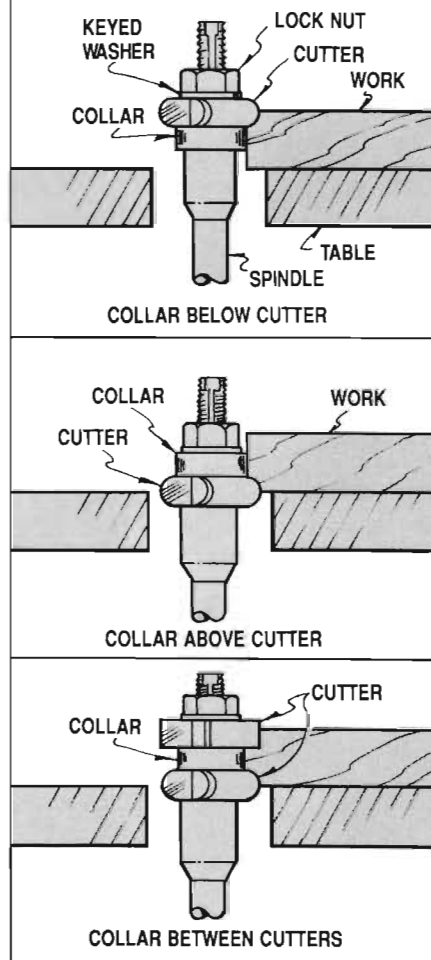
Photo 2

Luckily, though, the only secret for efficiency is accepting the tool's disinterest, twice checking setups before cutting, and when necessary, making test cuts on scrap stock before going on. There is magic in the tool, but you wield the baton.

The Tool

Essentially, a shaper consists of a table with an underside motor that rotates a vertical spindle on which cutters of simple or complex design are mounted. The spindle is a vertically adjustable, grooved, threaded shaft that receives a keyed washer and lock nut (Fig. 1A). The adjustability of the spindle, plus collars of various thicknesses and diameters that are placed over, under, or between cutters, allow positioning the cutter in relation to the table's surface and thus the workpiece (Fig. 1B). Collars, as will be demonstrated, are critical

FIG. 1B



dle adjustment with height gauge, and rugged construction throughout. And, as an add-on safety feature, it also includes a disk-shaped clear plastic guard. The guard, which has a ball-bearing center, mounts on the spindle to help keep hands away from the cutter. To exploit this type of wood shaper, a 3 hp reversible motor is recommended. Reversibility might be required for particular jobs, but more importantly, makes any cutter you buy more versatile.

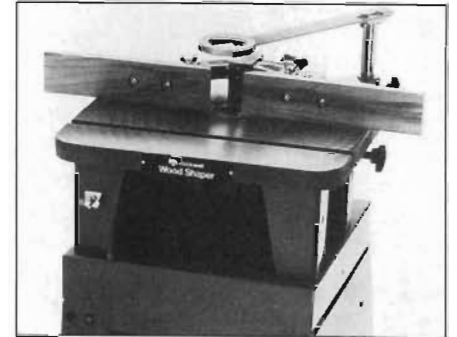


Photo 4

An example unit that might be more applicable for home-shop use, because of price if nothing else, is displayed in Photo 4. Its $\frac{1}{2}$ in. spindle can be interchanged with a stub spindle that makes it possible to use a particular type of cope cutter. A unique feature is an accessory router spindle that allows mounting $\frac{1}{4}$ in. and $\frac{1}{2}$ in. conventional router bits. A 1 hp motor with a reversing switch is recommended. Spindle speed should be about 9,000 rpm. A safety ring guard, mounted to the back of the table, helps to keep hands out of harm's way.

Shaper Fence

The shaper fence is a two-piece affair, each component being adjustable to-and-fro and laterally. Either part can be the infeed or outfeed fence depending on the cutter's direction of rotation. When the cutter rotates clockwise, work is fed from left to right so the fence on the left is the infeed unit only. The opposite applies when the cutter has been reversed to turn counterclockwise.

The bearing surfaces of the fences are set on the same plane (in-line) when only part of the work edge is removed (Fig. 2A). When the entire edge of the stock is cut away, the outfeed fence is

FIG. 1A

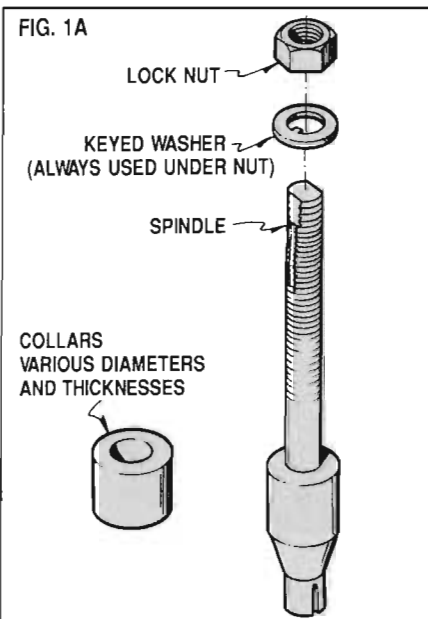
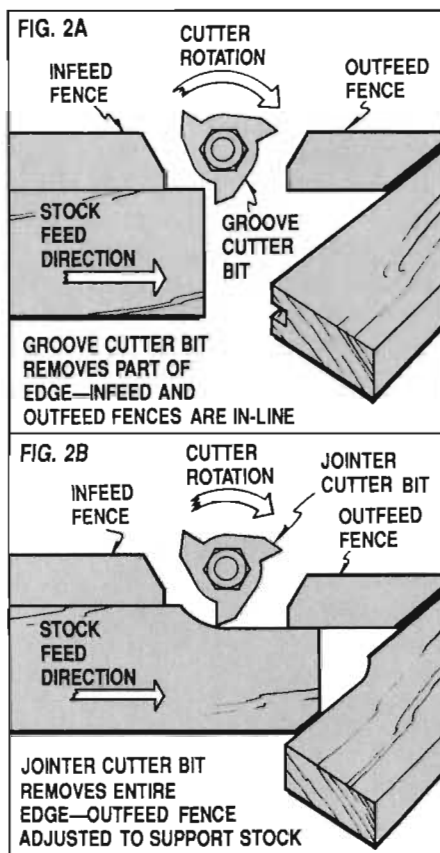


Photo 3

components when shaping is done free-hand.

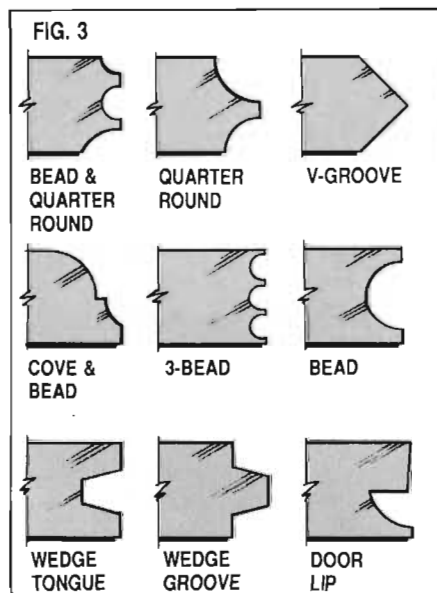
The unit that is shown in Photo 3 is common in school and cabinet shops and, quite often, in home shops. It's a heavy-duty machine that can accommodate $\frac{1}{2}$ in., $\frac{3}{4}$ in. and 1 in. spindles so there is little limit to the type and sizes of cutters it can handle. Other features include speeds of 7,000 and 10,000 rpm, an extra long spindle, hand-wheel spin-



adjusted to provide support for the work after the cut has been made (Fig. 2B). In either case, the fences are adjusted laterally to minimize the opening around the cutter.

Cutters

Shaper cutters are to a shaper what blades are to a sawing tool. The ma-



chine, in essence, is merely a support system. Without cutters, it can do nothing but hum.

There are many different cutter designs, but despite advances made in fabrication, the venerable three-lip solid cutters, which are practical and economical, are still popular. The examples displayed in Photo 5 and Fig. 3 don't approach the assortment of profiles that are available.

Cutters are either single-purpose, producing a shape for a particular job (like

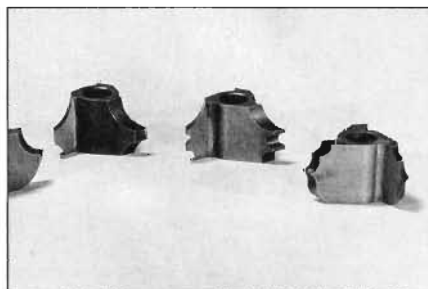
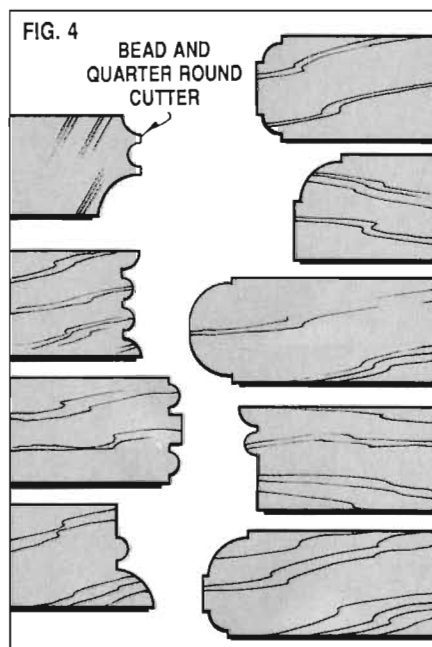


Photo 5



a cabinet-door lip), or are combination types intended for partial cuts. That is, a section of the profile will produce a usable form. The bead and quarter-round is a prime example, being able to form a bead or two sizes of quarter rounds. A few examples of what can be done with this single cutter are shown in Fig. 4. Results depend on cutter height (above the table), and cut-depth, which is determined by fence position.

Actually, any cutter, whether it's single purpose or combination, can be used for full or partial cuts, depending on the shape you want. It's also possible to exploit cutters by seeing them for more than their intended purpose. Photo 6 shows multi-applications for a tongue cutter (which can be part of a tongue-and-groove set or simply a 1/4 in. blank cutter).

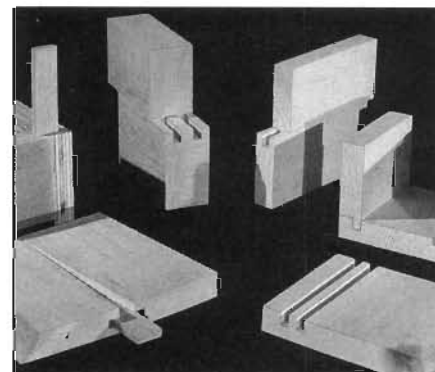


Photo 6

Carbide tipped cutters are to shaping what carbide-tipped blades are to sawing. Advantages are long-lived cutting edges and smooth cutting for long periods. A major disadvantage is difference in price, which is figured not in nickels and dimes, but in many, many dollars. "Super" cutters, like those for shaping rails and stiles (Photo 7), often consist of components that may be used individually or combined in various

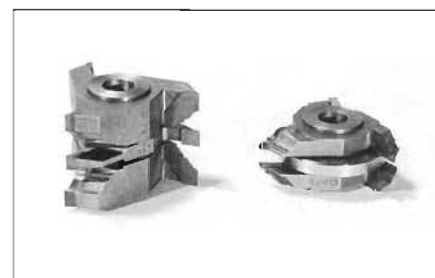


Photo 7

ways to produce the mating forms.

Always be sure that the cutter you are interested in can be used on the machine you own. It's likely, for example, that a cutter with a 3/4 in. bore is meant to be used on a heavy-duty machine. Even if the cutter is supplied with a 1/2 in. bushing, it's important to check whether your shaper is sufficiently powered to turn the cutter efficiently.

An idea that I find particularly useful is to have a collection of sample cuts.

It's a way to reduce setup time while assuring that the cutter/wood relationship is correct whenever you need to duplicate the operation. The thickness of the sample and work-stock must match, so a complete sample "book" may contain several examples of the cutter's profile but on different stock thicknesses.

At Work

It's often possible to choose whether the cutter should be over or under the work. When the cutter is topside you can see the cut, but an accidental lifting of the workpiece will mar it. You can't see the cut when the cutter is under the work, but an accidental lift won't cause a blemish and there is a safety factor in having the stock cover the cutter. Often, the cutter or the shape that's needed dictates position of cutter and work.

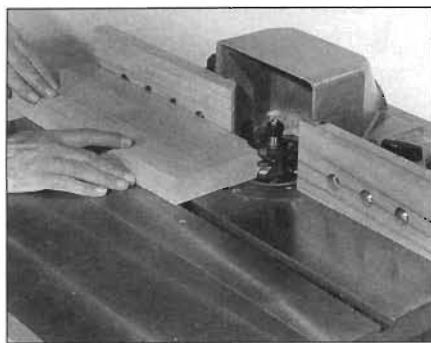


Photo 8

Always use the fences when doing straight-line shaping, and always feed the work against the cutter's direction of rotation. Keep the work down on the table and snug against the fence throughout the pass (Photo 8). The fact that the shaper is a high-speed machine doesn't mean that cuts should be rushed. A steady feed, moving the work only as fast as the cutter can handle, is good practice. If you have a light-duty machine and are making an exceptionally deep cut, it's perfectly acceptable to arrive at the final shape by making repeat passes.

Edges to be shaped should be in good condition: smooth and square to adjacent surfaces. Jointing the edge before shaping is a common practice among professionals.

Never shape pieces that are too small for safe handling. If you need narrow

moldings, do the shaping on wide stock and then rip off the part that's needed.

Always use a miter gauge when end-shaping narrow pieces or even wide pieces. If the gauge can be equipped with a hold-down, so much the better (Photo 9). Many times, an end-grain cut (like a cope cut) can be made on stock that is wide enough to supply the number of needed parts. An example: needing three rails 3 1/2 in. wide, do the coping on 12 in. stock and then saw it into individual pieces.

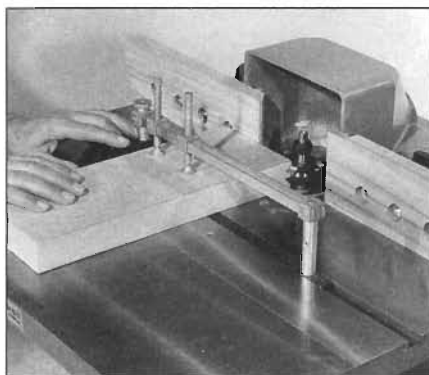


Photo 9

Make passes so cutting is with the grain whenever possible. There will always be a degree of splintering at the end of cross-grain cuts. This can be minimized by using a backup block, or it can be eliminated by shaping a piece a little wider than needed and then removing the flawed edge by sawing. Make cross-grain cuts first when shaping adjacent edges. When doing four edges, follow a sequence of passes that allows the final one to be made with the grain. The idea is for final cuts to remove flaws caused by cross-grain shaping.

Think in terms of supplying more than hand support for workpieces. For example, clamp a guide block to the

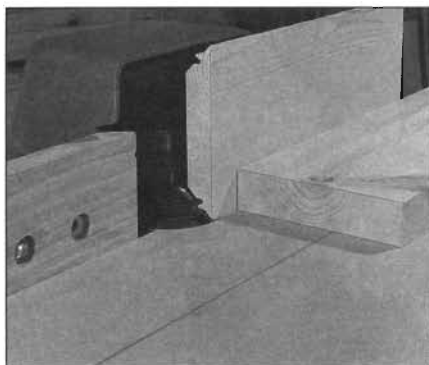


Photo 10

table when shaping is done with stock held on edge (Photo 10). The guideblock is short for the sake of clarity. In practice, it should be as long as the table's width. The precaution, in this case, will keep your hands away from the cut-area and will assure that the stock will be vertical throughout the pass.

Freehand Shaping

Freehand shaping is the technique to use when the form of work doesn't allow it to be guided by the fences (Photo 11). Smooth and irregular curves, even circular components are handled in this manner. The work is always done with collars that may be situated over or under the cutter. The collars are dual-purpose—they supply critical support for the workpiece, and they control the width of the cut. The disk-shaped clear plastic guard allows you to view the cut as it's made.

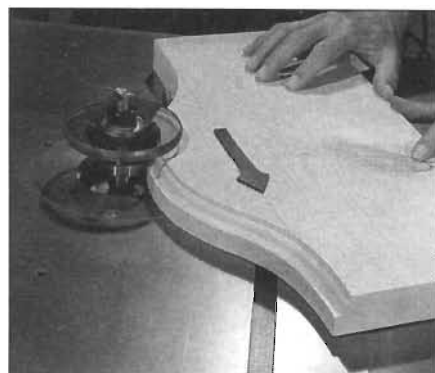
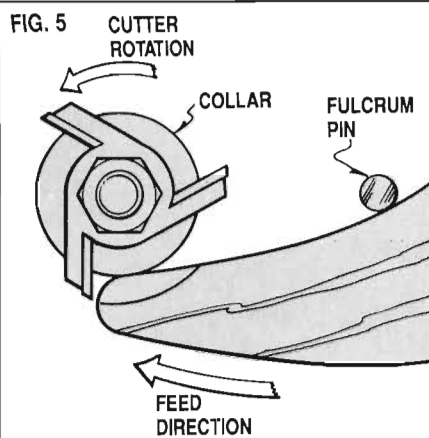


Photo 11

Setups are made so there is enough support or contact between collar and work to assure safety. Collars are available in steel or ball bearing design. Steel ones rotate with the cutter, so careful feed is needed to avoid work-burn. Ball bearing types are a better choice since they rotate as fast as the stock is fed. In either case, collars must be maintained with smooth, clean edges to avoid any possibility of marring the workpiece.

A second freehand-shaping factor is the use of fulcrum pins. Shaper tables are drilled or tapped for short, sturdy pins that can be situated on the left or right, or on both sides of the cutter. Their purpose is to provide a bracing point for the work so it can be advanced slowly into the cutter until it is firmly supported by the collars (Fig. 5).



Some operators will swing free of the fulcrum pin after firm contact with the collars is established, but what's the point? So long as the shape of the work allows it, it seems more logical to accept fulcrum-pin support as much as possible. Some shapers are supplied with a single pin. If so, it's wise to buy a second one and to use both to provide maximum work support before and after it has passed the cutter.

Edges to be shaped should be in good condition, especially when using collars for support. Any roughness, bump or dent in the working edge will be followed by the cutter.

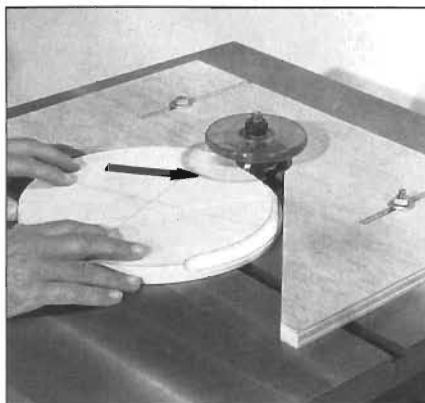


Photo 12

Circular components can be handled in a routine fashion, but it's more convenient, especially when similar pieces are needed, to work with a V-block (Photo 12). If the fulcrum-pin holes are tapped, it's a simple matter to

slot the V-block and use studs and nuts to secure the jig. If not, use C-clamps.

Be Safety Wise

Always work with guards that are supplied with the machine. If others are offered as accessories, buy them! Never shape pieces that are too small for safe handling. Keep your hands well away from the cutter. This seems obvious but the point must be made. Keep the machine, cutters, and collars in pristine condition. Dull or clogged cutters make it necessary to apply extra feed pressure, which is never a good idea. Also, cuts won't be of optimum quality.

Carefully read and follow all instructions by the manufacturer. When doing something new, or when you're in doubt about an operation, go through a dry run first. That is, go through the motions with the machine turned off so you can preview the procedure and judge the best position to take, and the wisest places for your hands to be.



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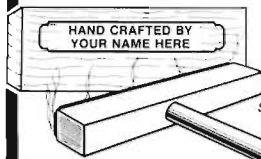
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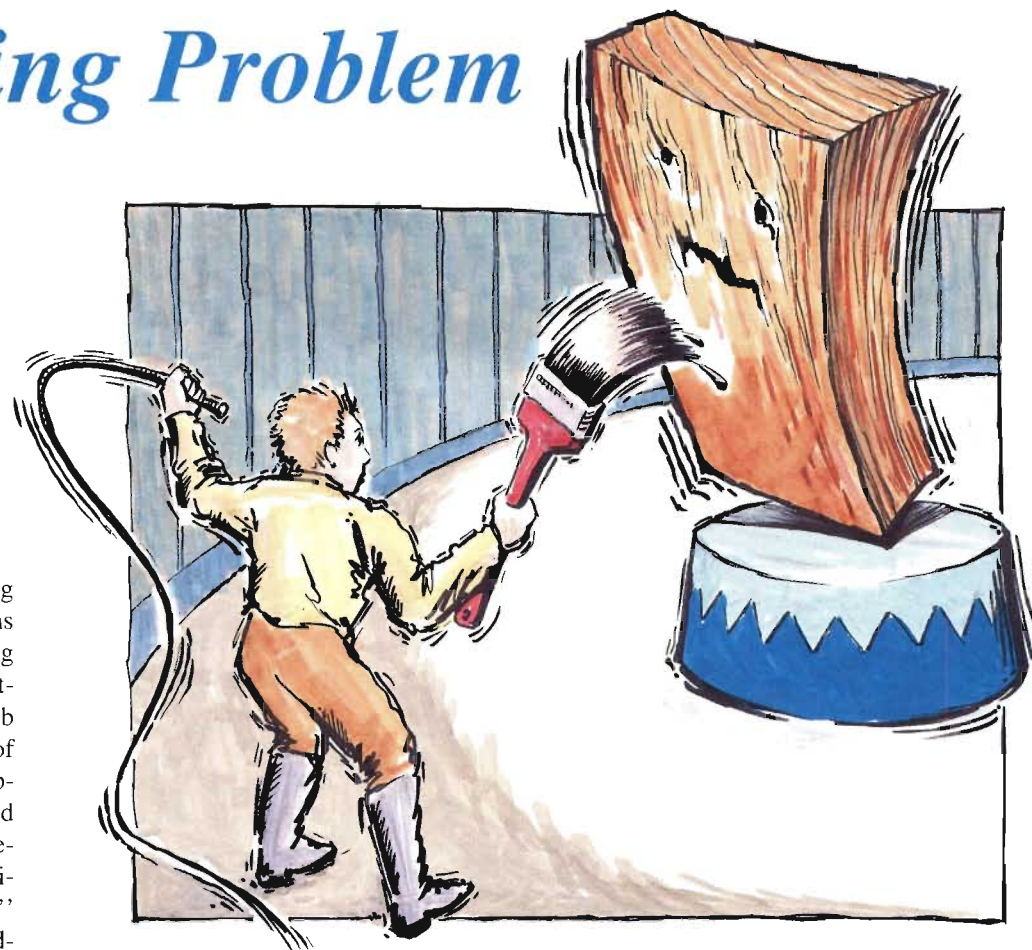


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Finishing Problem Woods

By Jim Barrett



For most woodworking projects, finishing is as simple as deciding whether or not to stain, selecting a finish, and getting the job done. But four specific types of woods can pose finishing problems. These four are: oily and resinous woods (teak, rosewood, and certain other tropical hardwoods); “bleeding” species (which include redwood, red cedar and padauk); hard-to-stain woods (pine, fir, cherry, and maple); and open-grained woods (oak, ash, mahogany). None of these woods present finishing problems if you’re willing to select an appropriate finishing system for them, but in doing so you often limit your options. Therefore, in addition to discussing the best finishes and finishing techniques for these woods, we’ll provide a few practical tips for those who want to “break the rules.”

Oily Woods

Many exotic tropical hardwoods, among them teak, rosewoods, wenge, cocobolo, and lignum vitae (to name a few) contain high amounts of natural oils and resins that are incompatible with surface finishes such as lacquer, oil and synthetic varnishes, and polyurethanes. The natural oils prevent good adhesion and often cause these finishes to dry unevenly (or not at all). Teak, cocobolo, and lignum vitae also contain high levels of silica, which reacts adversely with polyurethanes and some other plastic finishes. Oily woods are also notoriously difficult to glue, but fortunately we now have epoxies designed especially for them (brands include T-88 and G-2 epoxy; see “Gluing Oily Woods” in the May/June 1990 issue).

Penetrating oils (Danish oil, tung oil, and teak oil) are the finishes of choice for oily woods. They produce a soft,

hand-rubbed look and emphasize the natural grain characteristics. Although easy to apply and repair, these finishes aren’t as durable as clear surface finishes.

Penetrating oils work—as the name implies—by penetrating into the wood fibers. Once the oils dry, they harden and help protect the surface of the wood to the depth that they have penetrated. For some woods, penetrating oils can actually increase surface hardness up to 25 percent. Some penetrating oil formulas, called drying oils, contain driers and plasticizers that help dry and harden the natural oils in the woods for an even harder finish.

If your project calls for a clear surface finish such as lacquer, varnish or polyurethane, you’ll need to do two things. First, you’ll need to remove as much oil from the wood as possible, and second, you’ll need to apply a sealer to prevent any remaining oil from interacting with the finish. The process of removing surface oils can also be used prior to applying a penetrating oil finish, though it’s by no means mandatory.

To cleanse the wood of surface oils, wet the wood with lacquer thinner or acetone (a commercial dewaxer will also work), then vigorously wipe it down with soft absorbent rags. Keep rubbing off the oil until the surface takes on a whitish cast. A good cleaning should remove the oils to a depth of about 1/16 in., but since the remaining oil will start to migrate

to the surface almost immediately, you'll need to apply a sealer coat as soon as possible after the cleaning solvent evaporates. In most cases, we recommend a wash coat of finish thinned 50 percent with the appropriate solvent (specified on finish label). For interior applications, a 1-pound cut shellac makes an excellent sealer for lacquers and some oil varnishes, but should not be used under polyurethane unless the label indicates compatibility (remember to always check product labels for compatibility with shellac). Apply two thin coats of sealer, allowing the first to dry completely before applying the second.

In all cases, test your finishing procedure on a piece of scrap wood first, then wait a week or so to make sure no problems arise. Also, whenever possible, try to use finishes, sealers, and solvents made by the same manufacturer.

Bear in mind that no matter what finish you use, natural oils trapped in the wood will, over a period of years, migrate or "sweat" to the surface. They may eventually weep through a penetrating oil finish, or they may actually lift or cause a surface finish to lose adhesion. (This condition is aggravated by heat and direct sunlight.) The likelihood of this happening will be reduced if you follow our directions for first cleansing the wood of these natural oils, but cleansing and even sealing is no guarantee. This is another reason why we prefer a penetrating oil finish, which can be easily renewed. Should some of the natural oils start to show, just apply a fresh coat of penetrating oil and the finish should be good for a few more years. Over the years, as the process is repeated, the intervals between each fresh application should lengthen.

Bleeding Woods

Certain softwoods, notably redwood and red cedar, contain tannins which, when exposed to moisture, leach out of the wood. Chemically (and color-wise) the tannins are similar to those found in tea leaves or in tanbark oak (used to tan leather). Other bleeding softwoods include incense cedar, red cypress, and to a lesser extent, Douglas fir. The knots in knotty pine are also a common bleed-through problem, but with knots it's actually resins or sap that's weeping out and not tannins, so we'll cover that separately.

Ordinarily, the only time bleeding is noticeable is when you paint these woods with a white or other light-colored paint. And because the tannins (called extractants) are water-soluble, bleeding is more of a problem with water-based paints than with oil-based or alkyd paints. Bleeding is not a problem when the woods are stained or left natural. Of course, the ideal finish for these woods in exterior applications or outdoor furniture is penetrating oil. You'll not notice any discoloration from tannins, although the wood will naturally darken or gray as a part of the weathering process if the finish is not reapplied frequently.

For exterior applications, such as lawn furniture, decks, and siding, a quality exterior oil-based primer works best for sealing bleeding woods prior to painting. Water-based (latex and polyvinyl acetate) primers and water-reducible oil primers won't work nearly as well. But there is a trade-off: oil-based primers and paints don't hold up as well as modern latex

systems, especially when moisture is present. Also, they have a longer dry time, must be cleaned up with solvents, and their relatively high volatile organic compound levels may restrict their use in some metropolitan areas. We did find one stain-blocking latex primer that seals bleeding woods just as well as the oil-based primers: Fuller O'Brien's Latex Exterior Wood Primer. According to John Christiansen at Fuller O'Brien, the primer encapsulates the tannins in the surface film so they can go no further.

Charlie Jourdain at the California Redwood Association tells us that there are a number of stain-blocking primers on the market which retard extractive bleeding, but none of the manufacturers claim that their product is 100 percent effective in stopping bleeding. Two coats are suggested where bleeding is severe, and spraying the primer is more effective than brushing it on.

For most interior applications, bleeding is not a problem and the wood can be finished with any clear finish, or as in the case of cedar, be left unfinished to take advantage of its aromatic properties. But if an unfinished bleeding wood is subjected to extreme moisture conditions, such as in a kitchen or bathroom, the moisture will draw out the tannins, causing dark water marks. Jourdain notes that the best way to prevent water marks in damp situations is to apply several coats of polyurethane to all wood surfaces.

Some exotic hardwoods also bleed, notably padauk and rosewood. The dyes in these woods are activated by the solvents in lacquers, polyurethanes, and oil-based varnishes. In some cases, the dye in the wood will actually leach out and tint the finish, giving it a cloudy appearance. Another problem with these woods occurs when you laminate them against a lighter colored wood. For example, in a lamination of padauk and maple, the natural dye in padauk will dissolve in the finish, and in turn stain the adjoining piece of maple a lovely pink shade. The dye can also leach out and stain the adjoining wood through the glue joint.

The best way to deal with this problem is to remove as much of the natural dye in the wood as possible before gluing and finishing. Wipe down the piece with lacquer thinner or acetone before gluing. Wipe the wood down once more before finishing. Then apply several light coats of shellac or a wash coat of the finish you're using. If you have a spray outfit, spraying both the sealer and topcoat is preferable to brushing. Brushing tends to pull the dye out of the wood and mix it into the finish. If brushing is your only option, take extra care to avoid over-brushing the finish. If you aren't sure whether a particular finish may react with the natural dyes in the wood, test a scrap piece by brushing the finish in repeatedly.

For the woodworker who likes to work in knotty woods, especially resinous softwoods like knotty pine, the problem of the knots bleeding through the finish or telegraphing through paint is a common headache. The usual remedy calls for a wash coat of shellac (1-pound cut) to be applied over the knots. A second or even third coat may often be needed. However, remember to check for compatibility if you are planning to use polyurethane over the shellac. The shellac usually works, but in

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Finishing Continued

some severe cases you may still find beads of pitch oozing out years later. This is especially likely to occur if the piece of furniture is left in direct sunlight.

Hard-To-Stain Woods

Pine, fir, cherry, and maple are among the more difficult woods to stain with good results, but for different reasons. Pine is a highly absorbent wood, wicking up stain like a sponge. Blotchiness or uneven color is a common problem, and results can vary widely from one board to another. Dark stains, such as walnut, often take on a muddy appearance when applied to pine. Also, because pine absorbs stain quickly, it's hard to control color density.

Fir (especially fir plywood) tends to have a pronounced grain that contains alternating soft and dense wood. When a stain is applied, it is readily absorbed by the soft portion of the grain and repelled by the hard portion, resulting in a characteristic tiger-stripe effect. Cherry, although a denser wood, displays similar characteristics, making it hard to tame a flashy grain pattern and obtain even stain absorption.

If your aim is to produce an even stain color over grain variations in species that contain alternating soft, porous wood and then denser wood, you'll need to control the stain's penetration. Several companies, including Pratt & Lambert (Fabulon), Deft, Minwax, Fuller-O'Brien, and McCloskey, make a pre-stain controller which you apply to the wood before staining. With some of these products, the manufacturers recommend applying the stain immediately after using the stain controller; others recommend allowing the stain controller to dry completely before applying the stain. Stain controllers also work well on end grain, where you'll need to limit absorption to prevent out-of-balance darkening in relation to the other surfaces and edges. As an option to a stain controller you can apply several coats of sanding sealer, sand the surface smooth, and then apply the stain. But that's a lot more work than using the stain controller.

For soft, absorbent woods—especially pine—pigmented wiping stains are preferred over penetrating stains and aniline dyes because they do not penetrate as deeply, giving you more control over the evenness and depth of color. The pigments in wiping stains sit on the wood surface, much like a paint, obscuring the grain to some extent. This produces a more consistent appearance than penetrating colorants. The depth and intensity of color, and the degree to which the grain is obscured, depend on the color of the stain, the amount of pigment, and how heavily the stain is applied. Actually, most popular pigmented stains use mixtures of pigments with dyes and other colorants to provide maximum effect. But whatever the mixture, pigmented stains demand that you provide an evenly sanded surface for them to work properly.

Another method favored by some finishers to control color and stain absorption is to apply several coats of sanding sealer and sand thoroughly to achieve a smooth, scratch-free surface. Next, they apply a glaze stain. Glaze stains are made from Japan colors thinned with mineral spirits to a paint consistency. A heavy coat of stain is applied to the wood, then immediately

removed with dry brushes, going with the grain. The effect is similar to that which you would get with an "antiquing" kit. This procedure produces an even color and also enables you to control the amount of grain that shows beneath the finish. The brushing-off technique requires some practice to achieve a natural, realistic effect.

With maple, you have the opposite problem—the wood is so dense that most stains will not penetrate it easily. We found that the best stains to use are aniline dyes, which penetrate dense woods much better than pigmented stains, providing a deep, rich color without obscuring the grain. We generally recommend water-soluble dyes, or NGR (non-grain-raising) water-soluble dyes, such as the Solar-Lux dyes from Behlen's. (For more information on aniline dyes, see the November/December 1989 issue).

Open-grained Woods

To fill or not to fill—that's the first decision you must make. In most modern style furniture made of oak, mahogany, ash, and other open-grained woods, the pores are not filled, leaving a slightly textured surface. This is the route you would take for a natural look.

Don't expect to fill the pores with a sanding sealer or clear finish. You'll end up putting on many more coats than necessary, which then produces a cloudy surface that defeats the purpose of the clear finish you wanted to begin with. For a glass-smooth finish on open-pored woods, you'll need to use a wood filler.

Wood or pore fillers contain a non-shrinking filler medium called silex (finely ground quartz silicate) mixed with solvent driers, pigments, and binders. These products should not be confused with plastic wood fillers or putties made for filling large defects. Most fillers come in a concentrated paste form and must be thinned with solvent before use. You have two basic choices in fillers—a pigmented filler or a natural (neutral tone) filler to which you add stain or Japan colors to achieve the color you want. Some finish manufacturers offer colored fillers that match their line of stains; others have fillers which you mix with their stains for a one-step staining and filling process.

When buying a wood filler, make sure it's compatible with the stain and topcoat you're using. Many wood fillers are not compatible with polyurethane.

Bear in mind that when you use a filler, you're changing the natural look of the wood into something artificial. If you want the look of old oak furniture, use a dark brown filler (or black for mahogany). Some woodworkers see fillers as an opportunity to create special effects. In all cases, it's best to make several test pieces before you commit yourself to a particular color. The filler color will probably look different than you expected once you've applied a stain and topcoat.

There are more than a few techniques for applying wood filler, and most finishers will agree that it's one of the trickier finishing processes to do correctly. We generally recommend staining the piece first, sealing it with shellac, then mixing the filler with stain to match the already-stained wood before applying it. After filling, seal the surface with shellac or a

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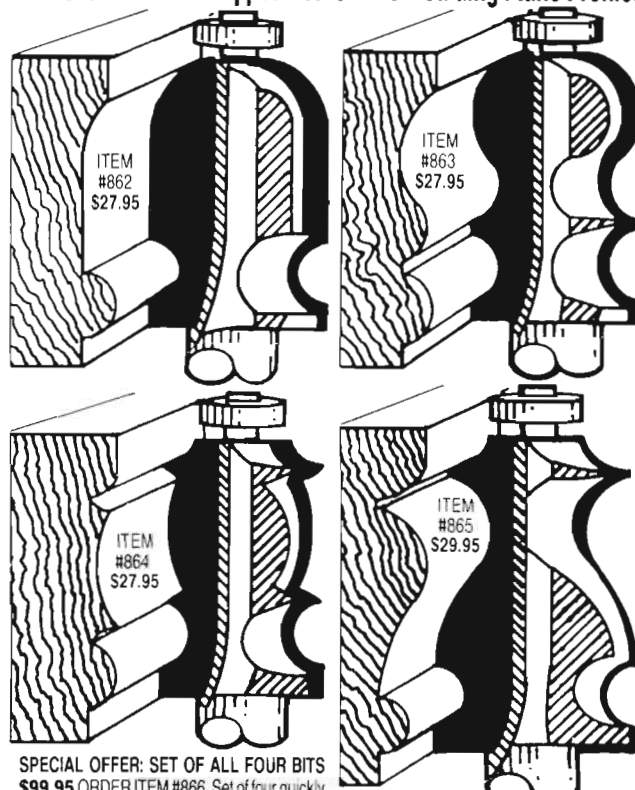
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wash-coat of the finish you're using. For a complete discussion on filling open-grained woods, see the Finishing column in the September/October 1988 issue.

Source List

The following companies distribute the finishes and products discussed in this article, or can direct you to a distributor in your area. Most paint and varnish companies distribute on a regional or local basis only, so you'll have to choose among brands available in your area.

Behlen's (Mohawk Finishes)

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Constantine's

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Latex exterior wood primer #220-08 (for bleeding woods), paste wood filler, sanding sealer/stain controller #62201

Lee Valley Tools, Ltd.

1080 Morrison Drive
Ottawa, ON Canada K2H 8K7
Tel. (613) 596-0350

Paste wood filler, aniline dyes, sanding sealer

The McCloskey Corp.

7600 State Road
Philadelphia, PA 19136
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Super Sanding Sealer (for polyurethane), stain controller

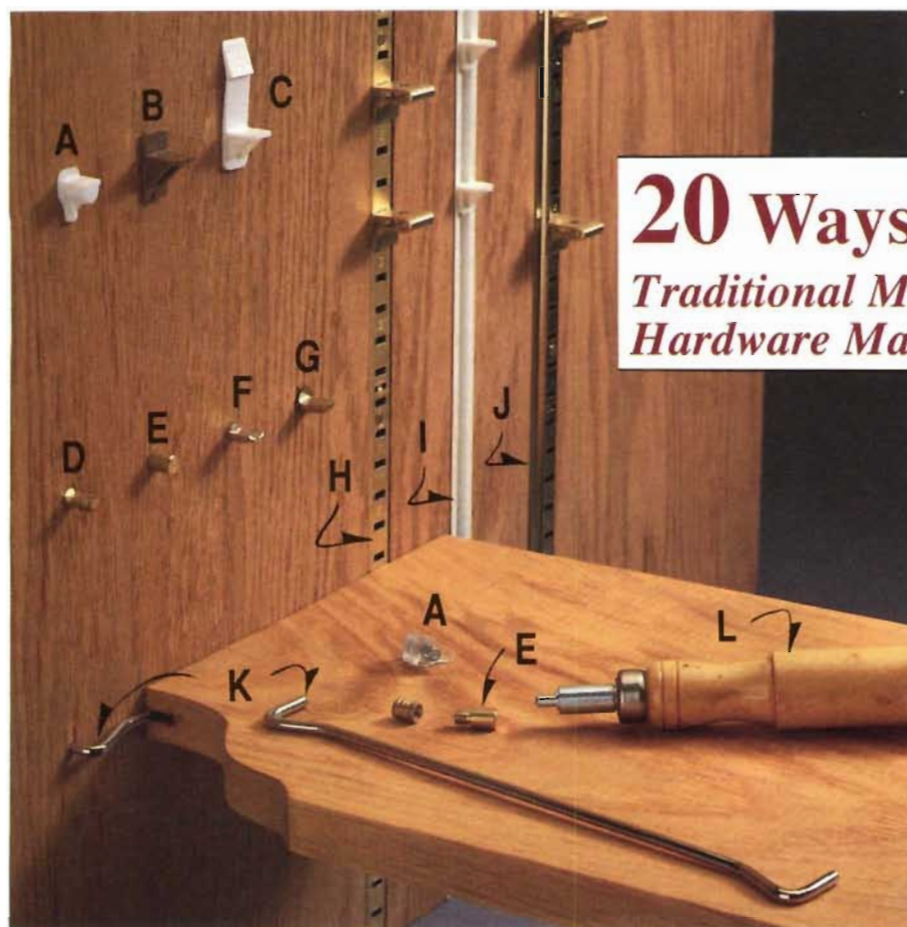
Pratt & Lambert

Specialty Products Division
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20 Ways to Hang a Shelf

Traditional Methods or Commercial Hardware Make Shelf Hanging Easy

Key for Commercial Hardware: A) Molded plastic over steel pin support; B) Plastic support; C) Plastic support with integral locking clip; D) Solid brass turned support; E) Solid brass tapped sleeve with threaded solid brass pin; F) Spoon-shaped support; G) Spoon-shaped "library" support with sleeve; H) Flush-mount steel standard with clip; I) Flush-mount plastic standard with clip; J) Surface-mount steel standard with clip; K) Invisible support wire; L) Sleeve-setting punch for setting solid brass tapped sleeve used with threaded solid brass pin.

Supporting a shelf, in many woodworking applications, is as basic as cutting a pair of dados, screwing a few cleats in place or drilling a series of holes for dowel pins. But to think of shelf support systems as limited to these traditional methods is akin to considering the butt hinge as the answer for all door hanging opportunities.

Woodworkers today are presented with a multitude of options for hanging shelves. There are the traditional methods, without any hardware, there are do-it-yourself methods involving shop-built hardware, and then there are the hardware store or catalog options, including a laundry list of devices from simple brass pins to flush-mounted shelf standards with matching clips.

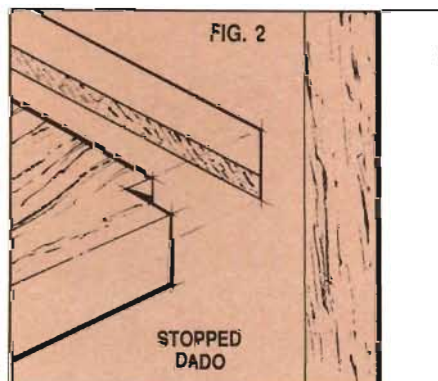
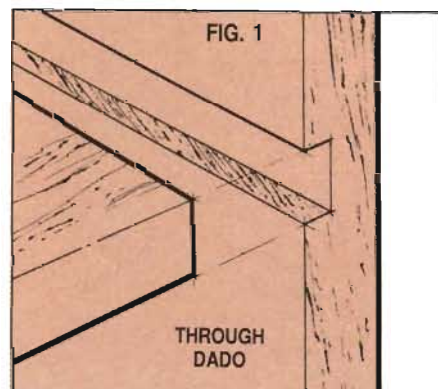
Deciding what to use is a simple matter if the plans call for a specific type of hardware or mounting system. But in most furniture any number of systems can be substituted successfully. Making up your mind may depend on considerations such as appearance, whether the shelf must include adjustability, and

which method is the easiest or least costly. When you are designing a piece from the ground up, deciding how the shelves will be supported takes on added importance, since machining for slots or pins is usually done before the piece is assembled.

Right-angle brackets and support systems that are used to mount shelves directly to walls don't usually require any woodworking expertise, so we've decided not to include them here. Instead, we've focused on shelf support systems used in case or furniture construction, where the support is provided at the shelf ends.

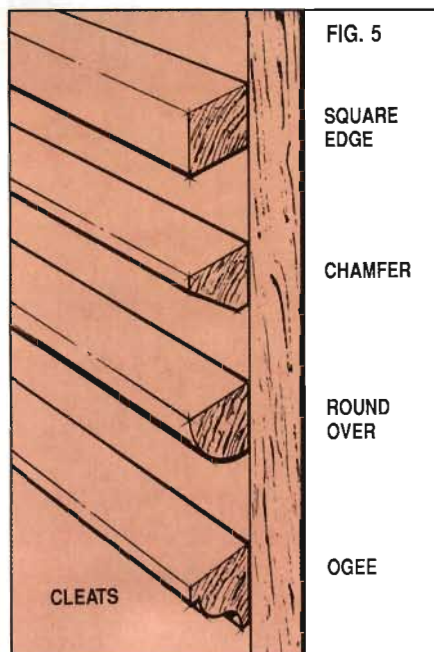
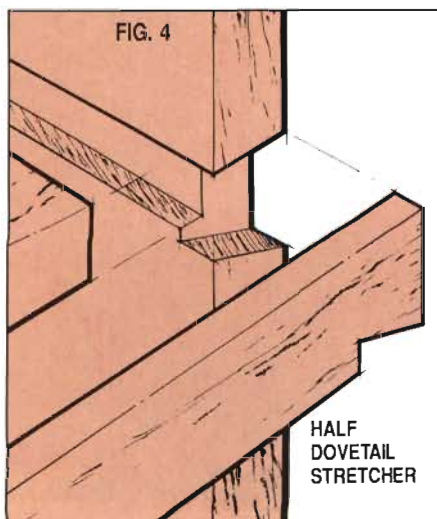
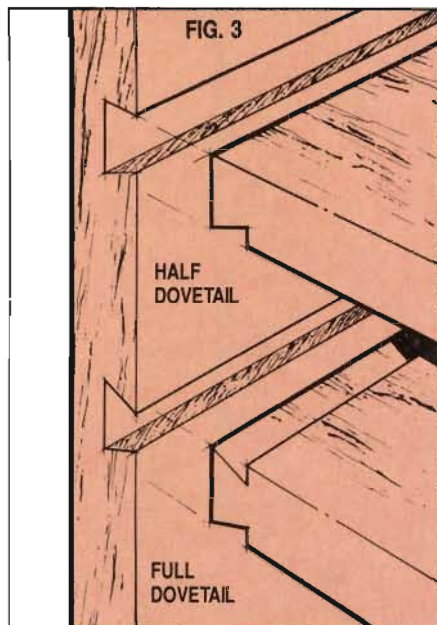
Traditional Methods

Where possible, it's usually best to locate a shelf permanently, as opposed to having to incorporate a system that permits adjustability. For a fixed shelf, you have several options. In case construction where there's a face frame to hide it, a through-dado (Fig. 1) is the simplest solution to mounting a shelf. In an open case, where the side edges are



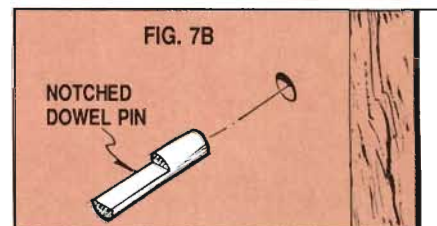
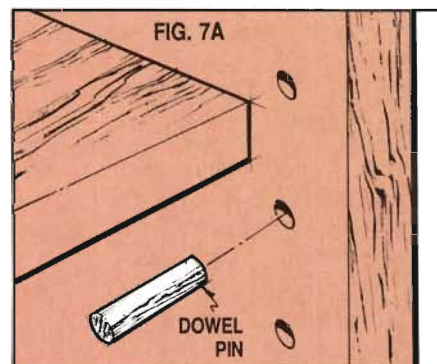
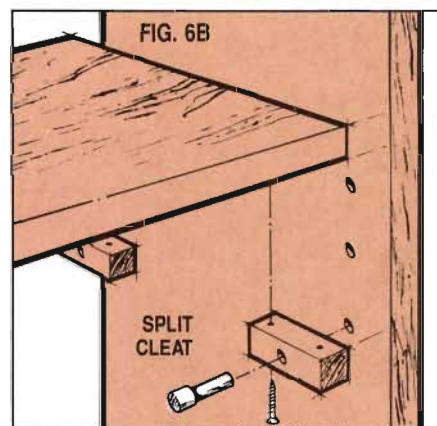
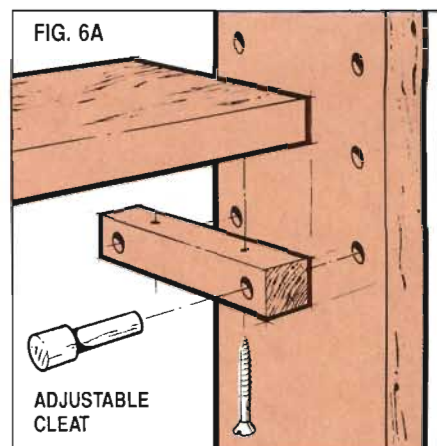
visible and a through-dado is undesirable, cut a stopped dado and notch the shelf to fit (Fig. 2).

In a high open bookcase the shelf may be needed to provide some side-to-side support. Half or full dovetails (Fig. 3) cut on the shelf ends enable the shelf to also act as a stretcher. This is usually preferable to screwing through the case sides and into the end grain. Where a long shelf is employed, a half-dovetailed stretcher notched into the front edges of the sides and glued to the shelf provides both lateral strength and support against sagging (Fig. 4). Making this stretcher from a contrasting wood adds interest.



A less desirable though usually adequate method of permanently mounting shelves is with cleats. The cleats can be as basic as a square-edged strip, or by adding detailing such as a chamfer, roundover or a molded edge, the cleat can become an element of design (Fig. 5). The downside of cleats is that in a solid wood construction they'll almost always be in a cross-grain orientation, which can be a problem with a very wide shelf. Consider mounting the cleats with screws through slotted holes if the shelf width exceeds 8 in.

If you've decided to use a cleat system to mount shelves, then you'll do well to consider the method shown in Fig. 6A. Here the cleats serve three purposes. First, they allow for adjustability; second, they prevent the shelf from sliding, tipping or lifting; and third, because they are screwed to the underside of the shelves, they stiffen the shelf against cupping. Cupping is a common problem with single-board solid stock shelves. As with the fixed cleats in Fig. 5, the length of the cleat is limited in situations that present a cross-grain problem. For wide shelves, split the cleat into two sections and locate each half close to the edge (Fig. 6B). Of course, by splitting the cleat you'll lose the anti-cupping advantage.

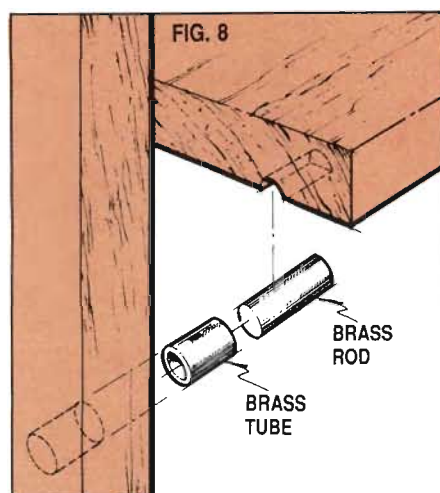


If you are a real minimalist, then you can use the easiest of all systems, the venerable dowel peg-in-hole method. In its bare-bones form, you just drill a series of matching holes, cut lengths of dowel, insert the dowel and rest the shelf

thereon (Fig. 7A). An improved version of this system is shown in Fig. 7B. Here, the dowel pin is notched. This provides a flat for the shelf to contact and keeps the dowel pin from accidentally working its way out. This latter feature is an advantage in situations where there's considerable vibration, such as a stereo cabinet adjacent to a pair of booming speakers.

Shop-made Hardware

Several years ago we had trouble locating top quality shelf pin hardware. Many companies sold the L-shaped steel pins and plastic shelf supports, but we wanted a system of solid brass supports set into brass sleeves. The sleeves are recommended for use in hardwoods, softwoods, particleboard, pressed board, MDF (Medium Density Fiberboard), or any application where a shelf pin is likely to deflect the material over time.



Our answer to the need for a quality shelf pin system was to use a section of $\frac{1}{4}$ in. diameter brass tubing as the sleeve, and a section of $\frac{3}{16}$ in. diameter brass rod as the pin. The brass tubing had a $\frac{1}{32}$ in. wall thickness, which made it a perfect fit for the $\frac{3}{16}$ in. diameter rod. A chamfer on the inside edge of the tubing made it easy to insert the pins, which fit snugly (if the fit is too snug, lightly sand the rod with 320-grit wet-or-dry sandpaper). We epoxied the tubing in place and notched the underside of the shelves so

they would lock over the pins, lending the shelf stability (Fig. 8). The notch also prevented the pins from working out.

Several companies now offer solid brass pin-and-sleeve shelf support systems, but by purchasing lengths of brass tubing and rod (sold by the foot, see Bill of Materials for source) and cutting your own shelf supports, you'll save considerably over the store-bought variety.

Commercial Hardware

There's a mind-boggling array of hardware for supporting shelves in a cabinet or case. All the hardware described here, and shown in the photo on page 31, is available through mail-order (see Sources). Although commercial hardware allows adjustability, much of what's available isn't what we'd call furniture quality. The plastic supports, metal L-shaped supports, and spoon-shaped shelf supports that are press-fit into a hole drilled into the sides of the case suffer one serious flaw. Because they are pressed directly into the material, without benefit of a supporting sleeve, they eventually work loose. Anyone who has experienced this problem with the plastic supports that are supplied with most commercial "boxed" kitchen cabinets knows just how frustrating this can be. The fact that the pin may be grooved for added holding power, or that the plastic support includes an integral clip to lock over the top edge of the shelf, fail to mitigate this most serious flaw. The plastic supports molded around a 5 mm galvanized steel pin, and the solid brass turned pins look a little fancier than the all plastic or steel supports, but fare no better since they too suffer from this fatal flaw.

We recommend a shelf pin that includes a sleeve or bushing. The spoon shaped "library" shelf supports can usually be ordered with a sleeve, but the best pin we've found is a system by Veritas that includes a solid brass sleeve that's tapped to accept a matching solid brass threaded pin. The sleeves, which

are available in two diameters—one for softwoods and another for hardwoods—are set with a special punch. But best of all, since the pin diameter is greater than the threaded post portion, when in place the pin covers the sleeve flange for a very clean look. The threaded feature also eliminates any chance that the pins may accidentally fall or vibrate out.

Another commercial shelf support solution is the shelf standard or bracket. These are usually stamped steel lengths of bracket, perforated to accept mounting screws and shelf support clips. The standards are available in either a flush-mount design, where the standard is installed in a groove or dado routed into the case sides, or a surface mount configuration, where they're simply screwed to the sides, no groove required. We prefer the flush mount standard, which results in a more finished look. Shelf support clips are usually predrilled so the shelves can be screwed down, or you can drill through them yourself. A variation of the shelf standard is the plastic flush-mount version, which is press-fit into a groove, or can also be reinforced with screws if desired. Most recently we used the plastic flush-mount standards in our Tool Chest (September/October 1990), and found them strong and easy to install.

All the commercial hardware shown thus far is in some way visible. You obviously wouldn't want to install a stamped-steel shelf standard in a Chippendale secretary, nor would you probably waste solid brass shelf pins in a plywood storage case for your finishing supplies. But in the right application, this hardware will fill almost all your needs for adjustable shelf support systems.

What about those applications where you need adjustability but don't want any hardware showing? Well, hardware designers have been at it again, this time coming up with the so-called invisible shelf support system. The system is just a heavy duty nickel-plated steel wire that is bent so it fits into a pair of matching holes drilled into the case sides. The shelf is routed with a half-blind dado or

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2" Wheel	\$ 3.10 / 12	\$16.00 / 100
Axle Pegs for above	\$ 3.50 / 100	\$30.00 / 1000
2-3/8" Little Man	\$ 1.40 / 7	\$12.00 / 100
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3/8" Round Bead	\$ 3.25 / 100	\$22.50 / 1000
1/2" Round Bead	\$ 3.50 / 100	\$25.00 / 1000
1/2" x 5/8" Spool	\$ 5.00 / 100	\$20.00 / 500
5/8" x 3/4" Spool	\$ 6.50 / 100	\$27.50 / 500
2" Puffed Heart	\$.80 / EA	\$12.00 / 25
2-1/2" Puffed Heart	\$.75 / EA	\$15.00 / 25
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1/2" Button	\$ 1.50 / 100	\$ 2.00 / 100
1-1/2" Spindle	\$ 8.00 / 100	\$12.00 / 100
2" Spindle	\$14.00 / 100	\$18.00 / 100
5-3/4" Spindle	\$.50 / EA	\$.65 / EA
3-1/2" Shaker Peg	\$14.00 / 100	\$24.00 / 100
1" Round Knob	\$ 4.50 / 25	\$ 6.00 / 25

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Woodworking Basics

Continued

slot on the ends, which enables it to slide in place over the wire. The spring tension of the wire creates a friction fit and insures the shelf can't tip, and the half-blind slot on the shelf ends completely conceals the wire. You'll need to size the shelf width to fit the length of the wire mount.

Tips

If there's one key to getting shelves right, whether they're permanently housed in a stopped dado or suspended via the latest state-of-the-art hardware, it's in getting those dados, dowel pins or hardware mounting holes to match up. There are several techniques that come in handy here. For dados, you can clamp the two sides edge to edge and rout the matching dados in a single pass, or if you are cutting those dados on the table saw you can cut each pair at the same fence or stopblock setting. Another option is to start with a board wide enough to yield both sides, then rip the board in half after the dados are cut. For the vertical grooves that house flush-mount shelf standards, cut each pair of grooves with the same rip fence setting to insure uniformity.

When cutting dados for fixed shelves, take careful note of stock thickness. Don't assume that the 3/4 in. thick stock you've just purchased measures exactly 3/4 in. thick. If you set your dado head for a 3/4 in. wide cut and go to work, you'll probably be in for a rude surprise. Always measure first, cut a test dado in some scrap and make a test fit, and only then get to work on your project stock.

For drilling dowel pin or hardware holes, one common technique to insure accuracy and alignment is to cut a length of pegboard to use as a template for your hole layout. Another technique, where standard peg board doesn't accommodate your layout, is to make a template from plywood and then use that template as your guide. A third option is to drill the holes in one side, then lay a sheet of paper over that side and use a pencil rubbing to transfer the hole layout to the paper. Tape the paper to the other side in

the proper alignment, drill the holes, and you'll have two sides with perfectly matched holes.

Or if you're planning to do a lot of shelf work, you'll do well to consider investing in one of the commercial shelf drilling jigs. The best system we've seen, from Veritas, makes use of rails, rods and clamp heads to insure perfect alignment in any application. The jig, which is available from Lee Valley Tools (see Sources for address), accepts different sized bushings to fit the shelf pin hardware you select. 

Sources

Constantine

2050 Eastchester Rd.
Bronx, NY 10461
Tel. 800-223-8087

Flush and recessed shelf standards and clips, molded plastic over steel pin supports, steel L-shaped supports, invisible shelf supports.

Woodworker's Supply

5604 Alameda Place, NE
Albuquerque, NM 87113
Tel. 800-645-9292

Spoon-shaped supports, library supports (with sleeves), plastic and locking-clip plastic supports, L-shaped steel supports, plastic flush-mount standards and clips, molded plastic over steel pin supports, solid brass turned supports.

Lee Valley Tools Ltd.

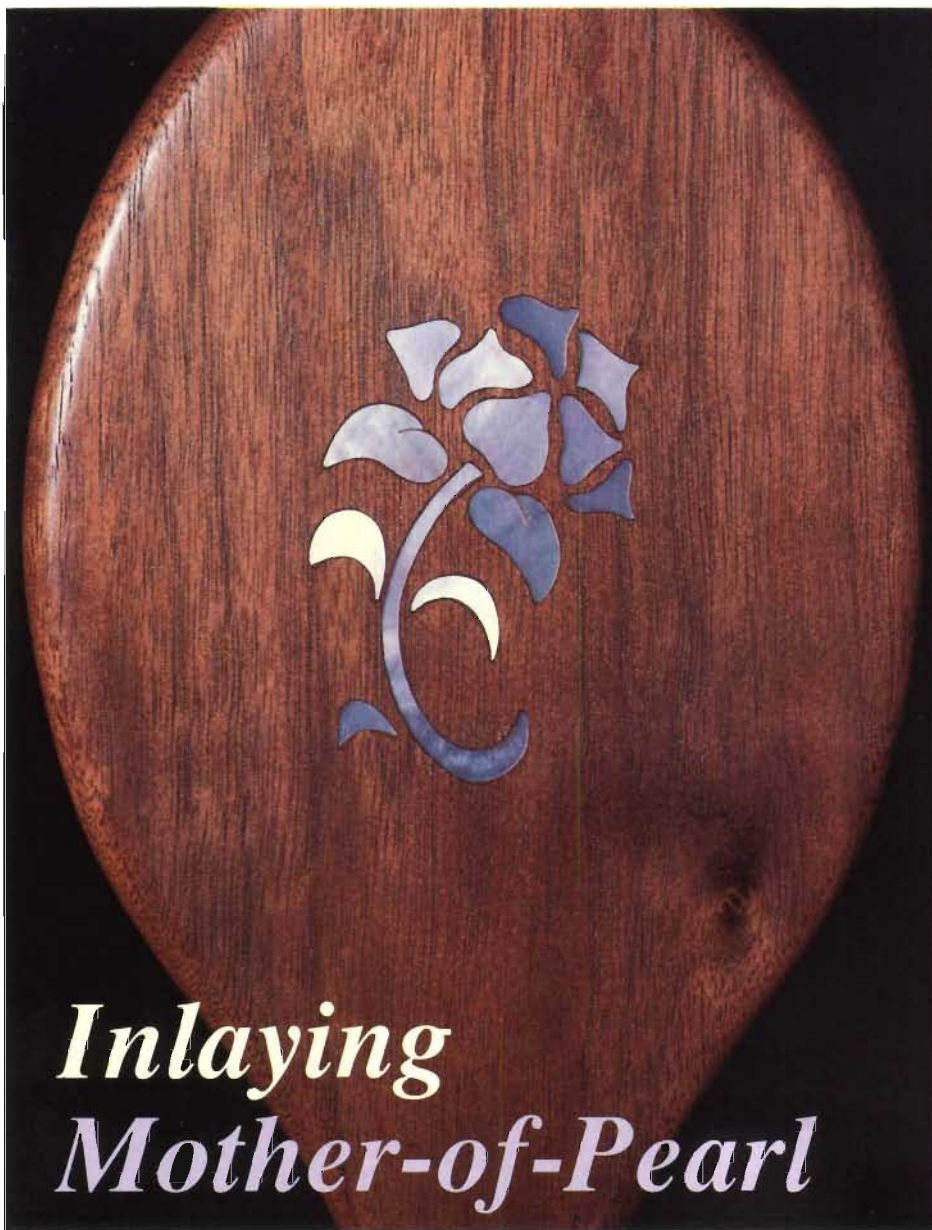
P.O. Box 6295 Station J
Ottawa, Ontario K2A 1T4
Tel. 613-596-0350

Veritas solid brass tapped sleeves with matching threaded pins, library supports (with sleeves), sleeve setting punch, Veritas shelf drilling jig.

Allcraft Tool and Supply

666 Pacific Street
Brooklyn, NY 11217
Tel. 800-645-7124

Solid brass 1/4 in. (OD) tubing, solid brass 3/16 in. rod.

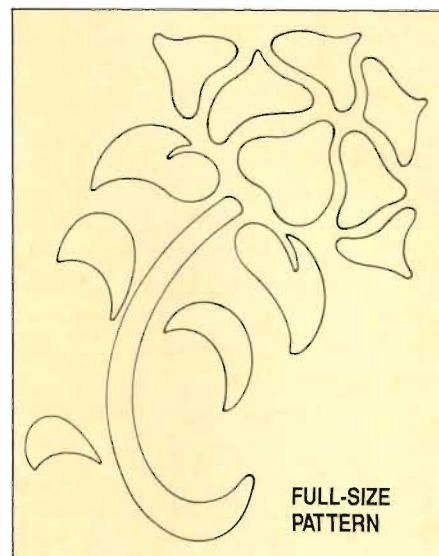


Inlaying Mother-of-Pearl

Mother-of-pearl is one of the oldest and most attractive forms of inlay. Cut from the shells of pearl oysters, mother-of-pearl is actually layers of calcium carbonate—called nacre—the same material as the pearls. Depending on the shape of the shell and the way the layers are formed, a variety of brilliant iridescent patterns are created. Skilled artisans use these patterns to build complex pictures or create special effects, but even without regard for the natural patterns, mother-of-pearl produces stunning inlays.

Historically, inlay was already well developed in ancient Egypt 4000 years ago. The Chinese were also highly

skilled in the use of mother-of-pearl to decorate furniture. More recently mother-of-pearl was popular in the 19th century, and during the Depression, when labor costs were low. Today, mother-of-pearl inlay is used mainly in jewelry and to decorate small boxes, high-quality furniture and musical instruments. Our Special Technique shows step-by-step illustrations for the mother-of-pearl inlay that decorates the back of the Hand Mirror project on page 54, but the general instructions apply to almost any inlay, whether pearl, bone, abalone, wood or metal. One cautionary note, though. Mother-of-pearl dust is a health hazard (see the Safety section).



Pearl inlay—or for that matter any inlay—is not a complex procedure. We tend to think of inlay as requiring artistic ability, but that is not necessarily the case. The art of inlay is in creating a design, not in the actual process of inlaying one material into another. When you have a design or a full-size pattern to work from, inlay is just a basic step-by-step procedure. You transfer the original pattern to the pearl, cut it out, trace the pattern from the cut pearl to your ground, rout the recess to accept the inlay, glue the inlay in place, and then sand smooth and finish.

Where traditionally inlay was very labor intensive due to the time required to mortise out the ground with hand tools, modern power tools have changed all that. The primary tool for inlay work today is the Dremel Moto-Tool equipped with a router base attachment. The router base essentially converts the Moto-Tool into a mini router, perfect for



Special Techniques

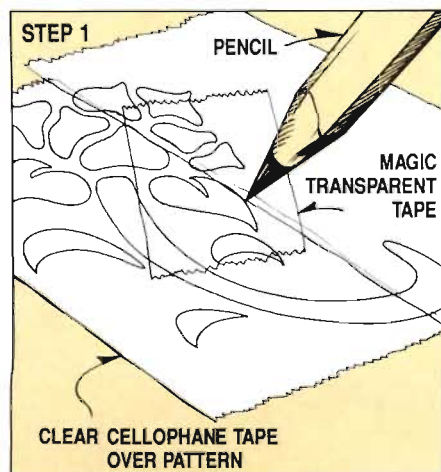
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all types of inlay work. The router base attachment also includes an edge guide for routing circles or straight lines, although the edge guide isn't used for the freehand routing that this inlay requires. Sources for the special tools and equipment you'll need to do inlay work, including a packet of mother-of-pearl sufficient for the hand mirror inlay, are given in the What You'll Need section.

As a rule, the inlay is done after the basic woodworking is complete but before the finish is applied, though there are exceptions to this. One common exception is where an inlay is used to decorate a panel in a frame-and-panel construction. Here the inlay work should be completed before the frame-and-panel are assembled. For our Hand Mirror project the inlay work is done after the mirror recess is routed, the profile is cut on the band saw, and the edges are rounded.

Step-By-Step

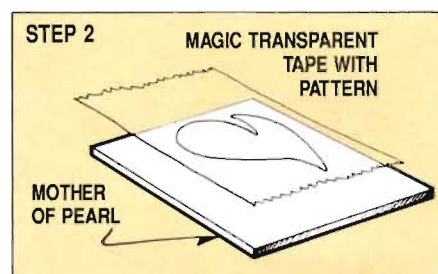
Step 1: Transfer the pattern. There are a number of techniques for transferring the original pattern to the pearl. You can use a pattern tracing stylus (see page 38 for ordering information) and carbon paper to copy the pattern directly to the pearl, or if you have access to a copy machine, you can make a photocopy, cut the pieces of the pattern out and tape them to the pearl.



But with our technique you can reuse the original pattern as many times as you wish, without damage. Start by taping over the original full-size pattern with clear cellophane tape as shown. You can

use a wide packing tape, or standard $\frac{3}{4}$ in. wide household tape. The tape will protect the pattern. To transfer each part of the pattern to the pearl, just place a small piece of Scotch Magic Tape over the part you want and trace the original pattern with a pencil. The Magic Tape has a surface that you can write on. We found that 1 in. wide Magic Tape was wide enough to cover even the widest section of the flower pattern.

Step 2: Locate the pattern on the pearl. Lift the piece of Magic Tape off the pattern and place it on the pearl. But don't just place the tape right smack dab in the middle of the pearl blank. Each of the pearl blanks will measure about 1 in.



by 1 in. or larger, so by carefully planning the layout you should be able to obtain several flower parts from each pearl blank. The stem will be the trickiest part. Save the longest pearl blank for it. If your packet of pearl doesn't include a blank that's long enough for the stem, then you'll need to break the stem into two sections. But don't worry, after you are finished the joint won't be noticed.

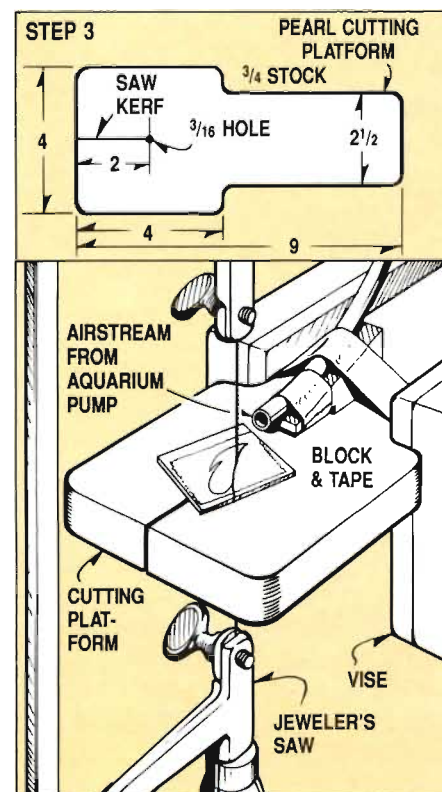
Step 3: Cut the pearl (be sure to use a respirator). You have several options for cutting the pearl. If you own a scroll saw, then you'll probably want to use it. If you don't, you'll need to cut the pearl by hand, using the jeweler's saw.

First, make a cutting platform. The pearl cutting platform is similar to the platform used by jewelers. It's just a section of $\frac{3}{4}$ in. thick board, cut to the shape shown. The long flats on either edge are for clamping the platform in a vise. An aquarium pump can be used as a blower. Place the pump motor unit on the bench and tape the flexible clear plastic hose onto the cutting platform so the end is directed at the cutting area. Use a small wooden block under the hose end to direct the air stream down

and towards the hole. Without the aquarium pump, you'll need to remove your respirator and blow the dust away regularly to see the cutting line.

Learning to use the jeweler's saw and cutting platform is a little like learning to ride a bicycle. Once you get the hang of it you'll be surprised at how quickly the work goes. The trick to the technique is to keep the saw blade in the hole. The pearl is then advanced and cut a little bit at a time. The best saw position is with the handle under the platform as shown. The teeth on the blade will face down, or toward the handle, which utilizes the cutting action to hold the pearl firm to the platform. Your fingers are the best device for holding the pearl in place, but spring clamps come in handy if your fingers tire.

Since our pattern involved mostly curves, we used the fine jeweler's blades for the majority of the cutting. They are delicate and break easily, but with experience you'll improve. You may break several blades cutting your first inlay, but a few inlays later you'll probably find yourself changing blades because they're dull rather than broken. One of the keys to blade longevity is setting the blade tension. You need

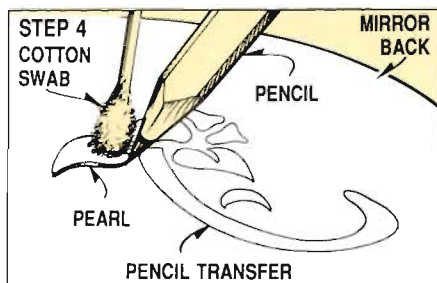


enough tension to keep the blade from buckling, but not so much as to place the blade under stress where it's liable to break easily.

One of the common mistakes made in cutting pearl for the first time is to treat the material as though it's more fragile than it actually is. The pearl can break, but it won't so long as you maintain a constant steady pressure on the piece while it's being cut, and use steady even strokes with your saw. Take extra care with the stem, which is the most difficult piece to cut because of its length.

Depending on your skill with the saw, after cutting the sections of the pattern you may need to make some final adjustments with a set of needle files. Just hold the pearl between your thumb and forefinger and file the edges of the pieces smooth. For an easier time fitting the pieces into your mortises, you can slightly bevel or undercut the edges with the files.

Step 4: Transfer the pattern to the ground (the material into which the pearl is inlaid). For our Hand Mirror, which is crafted in walnut, we found that a sharp pencil produced a line that could be clearly seen, although on darker woods, such as ebony or rosewood, you may want to first apply artist's Pro-white or a thinned white or yellow tempera paint over the pattern area. The Pro-white or light-colored tempera (both available from art supply shops) provide contrast for the pencil line, or if you use a scribe (see page 38 for ordering information), the darker wood shows as the line. It's

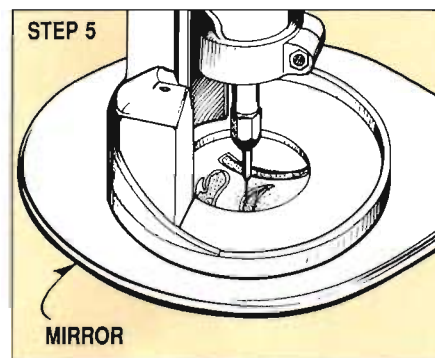


best to have the ground—in this case the back of the mirror—clamped securely to your bench top so it won't be moving about as you trace the pearl.

First position the elements of the pattern until you are satisfied with the placement. Compare your placement to the original pattern for accuracy. Then

trace around the individual pieces, one by one. A cotton swab comes in handy for holding the small parts, where a finger would be too large. We traced with a sharp pencil, although a scribe is another option if you have one. With a sharp scribe you can get closer to the pearl, producing a more accurate line and probably a tighter fit of the pearl in the mortise. Remove each piece after it's traced to provide clearance for tracing the pieces that remain.

Step 5: Rout the mortises. Equip the Moto-Tool with the router base attachment and use the 1/8 in. collet to chuck



the 1/16 in. solid carbide inlay bit. The bit depth of cut is set just a hair under the pearl thickness, allowing the pearl to stand a little proud of the ground's surface. Note that on our bit we had to grind the end of the shank back slightly to get the proper depth setting in the collet.

Remove the center of each section first, working out toward the pencil or scribe line. Stop well back of the line and switch to the 1/32 in. inlay bit. Check that the depth setting is the same, and now rout almost to the line. As shown, the finer bit will enable you to get into the points of the flower petals and leaves. Note that you'll need to clear the dust regularly to see what you are doing. We found that the exhaust stream from the Moto-Tool cooling fan blades works great for this. Just position the tool to direct the air stream toward the area you are working on. Of course, keep your fingers clear of the bit.

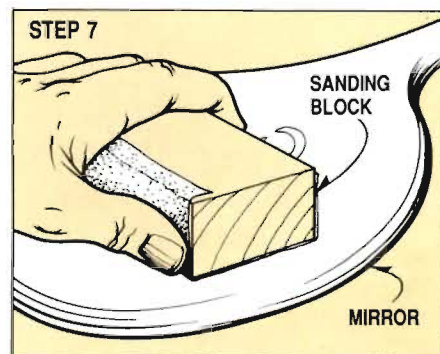
Check the pearl sections in the various mortises. Depending on the thickness of your pencil line, you may or may not have a perfect fit. If you used a very fine pencil or a sharp scribe, you'll need to rout right up to the line. With a dull

pencil, you'll have a proper fit when the mortise edge is a little shy of the pencil line. Check each piece of pearl and make any adjustments.

Step 6: Inlay the pearl. Any quick-set or 5-minute epoxy will do for inlaying the pearl. But first set aside some wood dust from the ground for mixing with the epoxy. If you don't have any dust, just sand a piece of scrap to get a small mound. You won't need much. This is an important step since it will fill any gaps around the pearl with a mixture that's nearly indistinguishable from the wood itself. Mix up the epoxy with the wood dust and spread a generous amount in each mortise. Make sure the entire bottom area of the mortise and all the corners are covered.



Press in the sections of pearl as shown. Don't dally here since the epoxy will start to set up. For larger patterns you may want to work on only a few parts at one time, or you can switch to a standard epoxy with 24-hour dry time. Press in the sections of pearl until they bottom out. The excess epoxy and wood dust mixture will be oozing out all around the edges, but don't worry about that now. You'll sand the excess off after it dries.



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#8574 Yardstick \$1.29/EA

Scroll Saw Plywood

3mm (1/8") x 2' x 2'
#8450 \$4.50/EA
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#8633 Plastic Jar 8" \$3.99/EA
#8635 Metal Lid \$1.59/EA

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#7293 3-1/2" x 16 linear feet \$13.95/EA
Basswood Glue-Ups
#8589 1/2" x 14" x 36" \$10.95/EA
#8592 1-1/8" x 14" x 36" \$15.50/EA

Birch Candle Cup

#CC1 1-1/2" \$2.90/10
\$19.00/100

Lazy Susans

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#LC4 4" \$1.30/EA
#LC6 6" \$2.29/EA

Clipboard Clips

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#ST6 6" \$1.95/EA

Saw Tooth Hangers

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Black Hammer

Hinge w/Screws \$1.76/2
#1730 \$7.80/10

Brass Plated Hinges

#910 1" \$1.65/10
#928 1-1/2" \$2.59/10

Screws for above

#F125 #5 Fl. Hd. \$2.75/100
Sanding Belt Cleaner 8" \$5.95/EA
#1710

Plastic Spoke Wheel 4"

#1741 \$1.19/EA

Metal Wheels

#1779 1-1/2" \$7.20/10
#1780 2" \$9.40/10

Shaker Pegs

#7226 3-1/2" \$2.00/10
\$15.00/100
#7280 2-1/2" \$1.90/10
\$13.90/100
#7227 1-3/4" \$1.10/10
\$7.60/100

Birch Spindles

#S6 5-3/4" \$1.75/EA
#S85 9" \$1.99/EA

Galley Spindles

#S1 Birch 1-1/8" \$1.65/10
\$10.00/100
#S4 Birch 1-1/2" \$1.70/10
\$15.60/100
#S10AK 1-1/8" \$1.50/10
\$12.00/100
#S40AK 1-1/2" \$2.40/10
\$22.00/100

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#941 Turn Knob \$2.59/EA

Animal Eyes

#8681 1-1/8" \$3.50/20
#8682 1-1/2" \$4.00/20

Chair Back Spindle 21"

#8147 Spindle \$2.35/EA

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#8711 Galvanized \$1.09/EA

Synthetic Sheep Wool 60" Wide

#8904 Sheep Wool \$9.95/YD
12 yards or more \$7.95/YD

Wood Hearts

#7379 1" x 3/16" \$1.59/10
#7380 1" x 3/8" \$1.79/10
#7381 1-3/8" x 1/2" \$1.99/10
#7461 3" x 3/8" \$3.75/10

Brass Bottle Opener

#7641 \$3.89/EA

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#7430 Peach Color \$7.99/EA

1" Grid Paper

#8206 22" x 34" \$1.89/Sheet

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MEISEL HARDWARE SPECIALTIES

P.O. BOX 70-J11 MOUND, MN 55364

Special Techniques Continued

Step 7: Sand and finish. Once the epoxy is dry, wrap a block of wood with 120-grit sandpaper and start sanding. Sand the surface until the pearl is level with the wood. Next switch to 220-grit sandpaper, and then to 320-grit. Finish up with 400-grit wet-or-dry paper. If you are using a penetrating oil finish, apply a generous coat of the oil and rub it in with the 400-grit paper. The pearl should be shiny and lustrous at this point, but for an even higher sheen you can use a polishing compound.

Safety

Inhaling shell dust over a period of time

(chronic exposure) is hazardous to your health. Mother-of-pearl and other shell dust is an irritant to your lungs and respiratory tract. Chronic exposure in shell workers is well documented, producing a condition aptly called "pearl lung."

Modern facilities working with shell have saws and other tools that use water, vacuum and filters to eliminate dust. If you don't have the means to eliminate the pearl dust from your shop, wear a respirator. Making one inlay will certainly not damage your lungs, but even a single exposure can prove irritating to some people.

What You Will Need

Tools and materials listed, except for the aquarium pump (available from pet supply and department stores), and the cutting platform (you make it) are available from: Stewart MacDonald's Guitar Shop Supply, 21 N. Shafer St., Box 900, Athens, OH 45701; tel. (800)-848-2273 (specify listed part numbers, when ordering).

Tools and Pearl Blanks

Dremel Deluxe Moto-Tool Kit: The kit includes the top-of-the-line 5-speed Moto-Tool plus a 40-piece accessory kit, all in a polyethylene carrying case. The kit also includes 1/8 in. and 3/32 in. collets, which are needed to hold the inlay bits. Order part no. 395. Cost is \$97.50.

Dremel Moto-Tool Router Base: Order part no. 566. Cost is \$25.35.

Solid Carbide Downcut Inlay Bits: The Deluxe Moto-Tool kit includes several high-speed steel inlay cutters, but we found that the solid carbide bits not only last longer but also leave a clean, no-fuzz edge on the routed recess. We used two bits, a 1/16 in. and a 1/32 in. Both bits have 1/8 in. shanks, so you'll need to use the 1/8 in. collet. Order part no. 38 for the 1/32 in. bit and part no. 40 for the 1/16 in. bit. Cost is \$10.98 each.

Jeweler's Saw: The adjustable frame enables you to set blade tension. Order part no. 664. Cost is \$12.89.

Saw Blades: Use medium blades for straight, fast cutting; fine blades for

intricate work. Order part no. 662 for a package of 12 fine blades; part no. 663 for a package of 12 medium blades. Cost is \$3.95 per package.

Mother-of-Pearl Blanks: Mother-of-pearl is sold by the ounce. A 1-ounce package will contain enough blanks for most designs. Order part no. 950. Cost is \$23.95 per package.

Kwik-Set Epoxy: Used to glue the pearl in place. Order part no. 627. Cost is \$6.49.

Cutting Platform: You make it.

Aquarium Pump: Available at pet supply and department stores.

Optional

Cutting Lubricant: Used to reduce friction and therefore extend the life of saw blades. Order part no. 1671. Cost is \$3.95.

Pattern Tracing Stylus: This is a mini ball stylus that enables you to use carbon paper as a means to transfer patterns directly from the original to the pearl stock. Order part no. 1673. Cost is \$5.95.

Inlay Tracing Scribe: This fine-point scribe will make a finer line than a pencil when you are tracing the pearl outline onto your ground. Order part no. 1672. Cost is \$2.95.

Further Reading and Instruction

Book: *Pearl Inlay* by J. E. Patterson. Order part no. 552. Cost is \$13.50.

VHS Video: *Pearl Inlay Techniques*. Order part no. 1141. Cost is \$39.95.

MEISEL HARDWARE SPECIALTIES



PROJECT PLANS FOR ALL SEASONS



SPECIAL ADVERTISING SUPPLEMENT TO THE WOODWORKERS JOURNAL

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Hi, my name is Paul Meisel. I design projects for you to make in your shop. This 8-page sampler shows just a few of the many projects that we have available.

You'll find that all of these projects are very "do-able". I have personally built every project shown using only a small table saw, a bandsaw, or a sabre saw and a drill press.

Our plans are easy for you to use because they are drawn FULL SIZE. And to make your project building even easier, you can order what we call "hardware kits", which contain any hard-to-find hardware parts you'll need. — All you supply is the wood. (And a couple of relaxing hours of your own time.)

Order with confidence! We are the nation's leading project plan company. Your purchase is backed by our UNCONDITIONAL GUARANTEE of satisfaction.

More good news! See hundreds of additional projects in our Fall Buyers Guide and our new Holiday Buyers Guide, available for only \$1.00 each. Or better yet, place an order and receive them free with your shipment.

Complete the order blank, enclose check, money order or credit card information, and mail your order to us in the enclosed envelope. For even speedier service, credit card customers can use our toll-free number, 1-800-441-9870.

Get started! I'll be looking for your order!

Very sincerely,

Paul

Paul Meisel, President

Meisel Hardware Specialties

P.S. Check out my FREE plan offer on the attached order blank.



"Enclosed is another order from your excellent publication. Seems like every time I pick it up, I make out an order. Your plans and products are the best I have found on the market. Keep up the excellent work."

William B. Merry
Boonville, IN

"Thank you for such speedy service. I also appreciate having somewhere to get the things we need."

Don & Linda Posivio
Sidney, MT

"So pleased doing business with you. What prompt service!! You have never disappointed us with the quality of your merchandise. Thank you."

Thomas W & Georgie Safford
Rapid River, MI

A SPLASH OF COLOR... INDOORS OR OUT

They stand by themselves or rest on your deck railing. Easy to build and paint. Uses standard 12 inch steel flower box. Animal bodies measure approximately 18" long. You get jumbo blueprint sheets with all pieces drawn FULL SIZE.. Hardware kits available below.

W550 Bessy Planter Plan	\$6.99/ea
W551 Pig Planter Plan	"
W552 Raccoon Planter Plan	"
W553 Goose Planter Plan	"
SAVE 3 or more Assorted Plans	\$5.99/ea

PLANTER HARDWARE KITS

These hardware kits contain an all-steel planter box liner and plastic eyes as shown in the photo (bell also included for the cow). The plywood is not part of the kit, but may be easily obtained locally. You will get the same professional quality planter box used by florists. Floral green enamel-finish box has guaranteed leak-proof construction. It measures approximately 5" high x 7" wide x 12" long. This hardware kit does not include plan, nails, wood, or paint. Combine hardware kits for quantity discount.

PLANTER HARDWARE KITS	5 or more
#9222 Bessy Hdw. Kit	\$5.95/ea \$5.40/ea
#9223 Pig Hdw. Kit	\$4.95/ea \$4.50/ea
#9224 Raccoon Hdw. Kit	" "
#9225 Goose Hdw. Kit	" "



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JUST FOR FUN

Pee Wee Pete will get a reaction out of everyone who sees him. People always smile, and many start laughing they love him so much. Cut from plywood and mount behind a tree, lamp or fence post. Dog measures 27-1/2 inches long. Plan drawn FULL SIZE

W572 Pee Wee Pete Plan

\$3.99/ea

BEAUTIFY YOUR YARD

Each year we get hundreds of requests for plans. Last year we received more requests for a woman in a swimsuit than all other yard ornaments combined. Choose small or large FULL SIZE plan.

W582 Leona Long Legs Plan 33" high \$3.99/ea

W583 Leona Long Legs Plan 41" high \$4.99/ea



JUMBO COWS FOR YOUR YARD

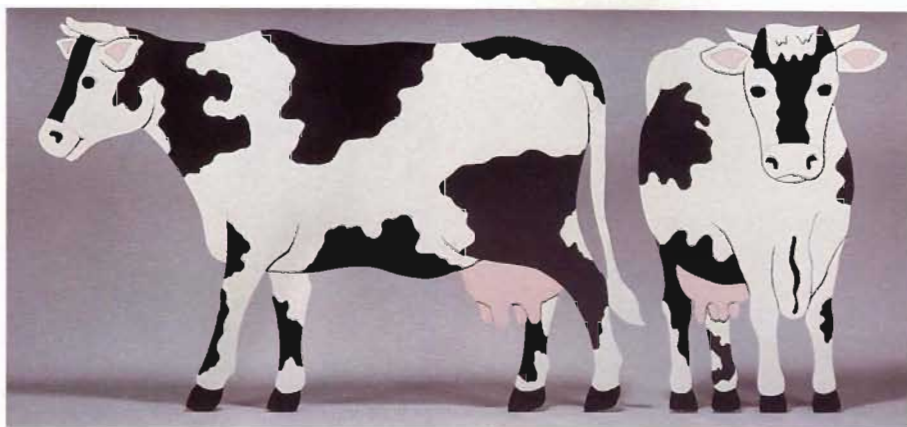
Our FULL SIZE blueprints make it easy to create these cows. Imagine these life-like yard cows welcoming visitors to your house. They're truly "country" and guaranteed to raise an eyebrow! Use a sabre saw to cut both of these cows from a single sheet of 1/2" x 4' x 8' plywood. Finished cows stand 40" tall. Both cows included in one plan. Blueprint measures 42" x 96".

W235 Yard Cows Plan

\$11.99/set

"We are very excited with your company. WE REALLY MEAN IT. We truly can't wait for our order to arrive and to get started on the projects. We are amateurs, but you should see our yard."

Ginny and Don Goin
Des Moines, IA



FLAMINGO ROAD

Not popular since the 1950's — now everyone wants flamingos! FULL SIZE blueprint shows 2 different stationary yard flamingos plus the palm tree. The special eyes, legs and knees are available in the hardware kit below.

W269 Yard Flamingos Plan

\$3.99/set

FLAMINGO HARDWARE KIT

This handy kit includes enough eyes, legs and knees to do 6 yard flamingos.

#8180 Flamingo Hardware Kit

\$6.95/ea



LIGHT UP THE HOLIDAYS

Make these holiday decorations which feature a blinking nose! Stake pushes in lawn or project can be made with a flat base for indoor display. All plans drawn FULL SIZE. Order hardware kit at right.

W420 Santa Stake Plan

\$3.99/ea

W421 Rudolph Stake Plan

"

W422 Snowman Stake Plan

"

W615 Bear Stake Plan

"

W616 Santa Stop Here Stake Plan

"

SAVE

W656 All 5 plans above

\$17.50/set

HOLIDAY STAKE HARDWARE KITS

These kits contain the lighting harness, bulb, plastic eyes, screws, and pre-cut wood banner. The plan, remaining wood, and paint are not included in kit. Mix or match hardware kits for quantity discount.

		5 or more
#8766 Santa Hdw. Kit	\$5.50/ea	\$4.95/ea
#8767 Rudolph Hdw. Kit	"	"
#8768 Snowman Hdw. Kit	"	"
#9203 Bear Hdw. Kit	\$5.99/ea	\$5.39/ea
#9193 Santa Stop Here Hdw. Kit	\$7.99/ea	\$7.29/ea



◁ FIRST CLASS MAILBOXES

It's hard to believe that such an easy-to-build project will make your mailbox "first class". These designs fit standard 6-1/2" wide rural mailboxes. Made from 1/2" plywood. FULL SIZE blueprints. Order hardware kits below.

W529 Pickup Truck Mailbox Plan	\$6.99/ea
W530 Fire Truck Mailbox Plan	"
W531 Car Mailbox Plan	"
W533 Tractor Mailbox Plan	"
SAVE 3 or more plans	\$5.99/ea

MAILBOX VEHICLE HARDWARE KITS

Kit contains wheels, axles, axle caps, wood ball head and hat. Plan, paint, flowers and remaining wood are not included.

#9227 Pickup Truck Hdw. Kit	\$14.99/ea
#9228 Fire Truck Hdw. Kit	"
#9229 Car Hdw. Kit	"
#9230 Tractor Hdw. Kit	"

"Thank you for the fastest service from a mail order company that I have ever received. I am well pleased with the quality and the quantity of products that are offered in your publication."
Cameron Nissen
Kansas City, MO



Just a beginner? Don't worry! These projects are designed to be easy to build! You can make them using just pine, or in some cases, plywood — both easily available at your local lumberyard. And you won't be needing fancy tools! All projects can be built with only a small table saw, a drill and a sabre or scroll saw.

Order today so you'll be able to experience the joy of giving handmade gifts during the upcoming holidays.



◁ ...TO MARKET, TO MARKET

Don't forget the milk! These grocery list holders will provide a convenient place to jot down your shopping list. Practical projects you can make for yourself or your friends. You'll get complete instructions and FULL SIZE blueprints for all three projects shown. Starter hardware kit available at right.

W500 Grocery List Project Plan	\$3.99/set
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△ ...OF THE OLD SCHOOL

These plant stands are replicas of the old-fashioned school desks. FULL SIZE plans for 8", 12" and 24" high desk.

W353 School Desk Plant Stand Plan	\$3.99/ea
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GROCERY LIST STARTER HARDWARE KIT

Enough parts to build one of each! You get the necessary brass bolts, hangers, and grocery pad; as well as an eagle; eyes for the pig; eyes, nostrils and bell for the cow; and a generous supply of refill sheets. Plan and wood are not included in kit.

#9226 Grocery List Starter Hdw. Kit	\$10.95/ea
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◁ COUNTRY END TABLE

Country end table measures 24" high. Hinged sides open to a 24" x 29" surface. Spectacular in pine! Hardware kit available below.

W317 Country End Table Plan \$3.99/ea

COUNTRY END TABLE HARDWARE KIT

Kit contains 2 drop-leaf supports, 44 screws, 4 hinges, and 12 screwhole buttons. Plan and wood are not included in kit.

#8878 End Table Hdw. Kit \$7.50/ea

SAVE 10 or more \$6.75/ea



These projects are all useful! A table with drop-leaf sides, a jewelry box that's big enough to hold all her jewelry, and action toys that are fun for children to play with. And have you ever seen such an unusual mailbox? You don't have to live in the country to make our mailbox covers. Our friends in the city simply mount them near their front door. Enjoy the fun of building a quality project. Place your order right away!



NO MORE TANGLES!

This box is high enough (16") so that long necklaces can hang tangle free. Drawers help keep jewelry organized! Easy to build from 3/4" pine, 1/4" and 3/8" plywood! Hardware kit available below.

W141 Jewelry Chest Plan \$3.99/ea

JEWELRY CHEST HARDWARE KIT

This 104-piece hardware kit includes all the hardware needed to build the jewelry chest in Plan W141. Plan and wood not included in kit.

#1523 Jewelry Chest Hdw. Kit \$15.95/ea



THE RACE IS ON...

These cars really go! Easy to make. Paul worked with industrial designer John Lewman to create a car that looks as good as it goes. You get FULL SIZE plans for **all four** cars shown.

W227 Rubber Band Racers Plan \$3.99/set

RUBBER BAND RACERS HARDWARE KIT

This 70-piece kit includes the wheels, axle pegs, axle caps, rubber bands, wood dowels, headlights, and radiator caps needed to build **all four** rubber band cars featured in Plan W227. Plan and remaining wood not included.

#7469 Rubber Band Racers Hdw. Kit \$11.99/ea



STRICTLY FOR RACING!

This car out performs every other rubber band car we've tested. Plan drawn FULL SIZE. Hardware kit available below.

W558 Rubber Band Speedster Plan \$2.75/ea

RUBBER BAND SPEEDSTER HARDWARE KIT

All the hard-to-find hardware parts for one rubber band speedster. You get 2 rear wheels with rubber traction bands, 2 self-lubricating bearings, rear axle, axle pin, steel front axle, front dragster wheels, motor drive band with hook pin, 2 axle caps, and wooden driver. (Plan, paint and remaining wood not included in kit.)

#8983 Rubber Band Speedster Hdw. Kit \$3.99/ea

SAVE 5 or more \$3.59/ea



WOBBLY WALKERS

These pull toys are easy to cut from lumberyard materials using a scroll saw, band saw, or even a coping saw. Each toy "bobs" when pulled. Plan set includes FULL SIZE patterns for **all eight** projects shown.

T72 Pull Toys Plan \$11.99/set

*"Thank you for your past quick and efficient service. Also your products are tops with me."
Charles C. Anderson
Voltaire, MD*



◀ GREAT FOR GRANDKIDS

Get plans for both projects — the rocking chair and the potty chair. Rocking chair features safety stops on back of rockers, plus a convenient storage drawer. The potty chair uses chamber pot plus squirt deflector. Both chairs measure approximately 21" high. Plans drawn FULL SIZE. W597 Teddy Rocking Chair/Potty Chair Plan \$9.99/set

POTTY CHAIR PARTS

The "essentials" for the Teddy Bear potty chair. For girls, order the chamber pot only. For boys, order the chamber pot and deflector cup. Both are made from soft, sanitary and easy-to-clean plastic.

#8140 Potty Chamber Pot

\$1.79/ea

#8141 Squirt Deflector

\$1.39/ea

FRIENDLY CRITTERS FOR SCARY NIGHTS

These night lights offer safety and security. Projects are large enough to set on a table, shelf, or the floor — anywhere light is needed. Lamps measure approximately 10" tall. This set includes plans for **ALL FIVE** projects shown, all drawn FULL SIZE. Hardware kits available below. W554 Night Lights Plan \$6.99/set

NIGHT LIGHT HARDWARE KITS

Our economically priced hardware kits take all the hassle out of locating the "hard-to-find" parts. Each kit contains the candelabra socket with 6' cord. You also get an on/off switch, plug, bulb, candle tube, candle cup, as well as the accents such as eyes or noses needed for each project. The plan and wood are not included in kit. Mix or match kits for quantity discount.

#9010 Bear Hdw. Kit	\$4.99/kit
#9011 Caterpillar Hdw. Kit	"
#9012 Mouse Hdw. Kit	"
#9013 Rabbit Hdw. Kit	"
#9014 Raccoon Hdw. Kit	"
SAVE 6 or more	\$4.49/kit



◀ COIN BANK PLANS

The world's cutest banks — and you can make them! Cut them from standard 1-1/2" stock. Order clear side plates below. Plans drawn FULL SIZE.

W339 Dinosaurs Plan

\$3.99/set

W600 Three Animals & Glove Plan

\$3.99/set

BANK SIDE PLATES

These plastic ovals feature polished edges and the holes for the screws are already drilled. Order two ovals for each bank you build.

#8605 Bank Side Plates (6" x 4-1/2") \$1.95/ea

SAVE 6-19 \$1.85/ea

SAVE 20 or more \$1.75/ea

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MUSICAL MENAGERIE

FULL SIZE plans make these projects easy to transfer to 3/4 inch stock. The secret is in the electronic music box in our hardware kit available below. Mix or match any four or more plans for BIG SAVINGS!

W287 Musical Rudolph Plan	\$2.75/ea
W320 Musical Rabbit Plan	"
W327 Musical Dinosaur Plan	"
W328 Musical Teddy Plan	"
W410 Musical Bessy Plan	"
W518 Musical Goose Plan	"
W521 Musical Puppy Plan	"
W522 Musical Sheep Plan	"
W523 Musical Pig Plan	"
SAVE 4 or more assorted plans	\$2.25/ea

MUSIC BOX HARDWARE KITS

All the hard-to-find pieces! You get the miniature electronic music box with battery, a push peg, sawtooth hanger, screws, as well as eyes, noses, turn buttons, ribbon bows or sheep's wool where appropriate. (The project plan, wood and paint are not included in kit.) Mix or match music box hardware kits for quantity discount.

MUSIC BOX HARDWARE KITS	6-11	12 or more
#7906 Rudolph	\$4.79/ea	\$4.29/ea \$3.89/ea
#8390 Rabbit	\$3.79/ea	\$3.29/ea \$2.99/ea
#8494 Dinosaur	\$3.19/ea	\$2.79/ea \$2.49/ea
#8495 Teddy	\$4.19/ea	\$3.69/ea \$3.59/ea
#8622 Bessy	\$3.95/ea	\$3.55/ea \$3.19/ea
#8972 Goose	\$2.99/ea	\$2.69/ea \$2.49/ea
#8975 Puppy	"	" "
#8976 Sheep	"	" "
#8977 Pig	"	" "

"In the few years we have done business with you people we find the quality of your products to be very high and your service is excellent."
Frank Riester
Asheville, NC

"It sure is a pleasure doing business with your company. I have been a customer for over 3 years. Keep up the new ideas, I love it. Thanks!"
Ed Weidman
Sterling Heights, MI



BUCKETS OF FUN

Place the apple or the acorn on the springboard. Can you flip it in the bucket? Sure you can, but it is a challenge. Everyone loves this one! This plan includes FULL SIZE drawings for both projects shown.

W515 Squirrel & Truck Springboard Plan \$3.99/set

SPRINGBOARD HARDWARE

#8710 Red Pail, 2-1/4" dia.	\$1.09/ea
SAVE 12 or more	\$.99/ea
#8181 Acorns, 1", 4/pkg	\$2.00/Pkg
#8182 Apples, 1", 4/pkg	\$2.00/Pkg



SHELF SITTERS

These shelf sitters may be dressed in a neat little cotton dress and apron or a pair of bib overalls with neckerchief. The bodies, movable arms and legs are all easy to cut from standard 3/4" stock. Finished figures are approximately 12" from head to toe. Plan includes FULL SIZE cutting patterns for all four shelf sitters. Order shoes and clothing separately.

W534 Sitter Critters Plan \$6.99/set

The perfect finishing touch for any wood doll. One-piece soft plastic white shoes. Sold by the pair. Approximately 1-1/4" wide x 2-1/8" long.

#8946 Doll Shoes	\$.89/pair
SAVE 6-11 Pairs	\$.79/pair
SAVE 12 Pairs or More	\$.69/pair

DRESSES/OVERALLS

These dresses and bib overalls are ready to slip on your shelf sitter. Dresses are hand sewn in Minnesota. Choose from red, blue, yellow or green Calico fabric. White apron is included with each dress. Bib overalls include red neckerchief. Mix or match dresses and overalls for quantity discount.

#8948 Blue Dress w/White Apron	\$6.89/ea
#8949 Green Dress w/White Apron	"
#8950 Yellow Dress w/White Apron	"
#8951 Red Dress w/White Apron	"
#8952 Denim Bib Overalls	"
w/Red Neckerchief	
SAVE 6-11	\$6.19/ea
SAVE 12 or more	\$5.49/ea

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A TASTE OF COUNTRY

So outrageously proportioned that everyone who sees this long tall lady falls in love with her. She stands 40" tall and is made from "2 x 4's" and 3/4" stock. Order Big Bessy hardware kit and optional 6" straw hat and corn cob pipe below. Plan drawn FULL SIZE.

W343 Long Tall Bessy Plan **\$3.99/ea**

True "Country" furniture! This Holstein end table is 18" high. Make it from 1/2" plywood and standard 1-1/2" stock. FULL SIZE blueprints make this project easy to cut out and assemble. Order Big Bessy hardware kit below.

W595 Holstein End Table Plan **\$6.99/ea**

It's a planter or a magazine rack! This Big Bessy stands 25" tall. Made from 1/2" plywood. Some 3/4" stock is also required. Plan drawn FULL SIZE. Order Big Bessy Hardware Kit below.

W345 Planter Box Bessy Plan **\$6.99/ea**

BIG BESSY HARDWARE KIT

This parts kit is used with any of the 3 projects above. It includes 2 plastic eyes, 2 plastic nostrils, 1 cow bell, and 4 udder pegs.

#8617 Big Bessy Hdw. Kit **\$2.79/ea**

SAVE 10 or more **\$2.49/ea**

STRAW HAT & CORN COB PIPE

These are real straw hats, but only 6" in diameter! Perfect for use on Long Tall Bessy and Planter Box Bessy. Pipe is 3-1/2" long.

#8670 Straw Hat **\$1.19/ea**

#8671 Corn Cob Pipe **\$1.29/ea**



A YARD DECORATION TO WELCOME FRIENDS

This friendly critter attaches to your mailbox post and patiently awaits the mail carrier. May also be placed on fence posts, yard lamp posts, storage sheds, etc. Cut from 1/2" exterior plywood. 48" tall. Plan drawn FULL SIZE.

W573 Bull Mailbox Plan **\$9.99/ea**

"Wife is very tickled with Long Tall Bessy!"
Charles Fisher
Enumclaw, WA



GESUNDHEIT!

This small Bessy holds a box of tissue or a floral arrangement. A snap to make from 3/8" plywood. Finished project stands 12-1/2" tall. Order Small Bessy hardware kit below.

W411 Tissue Box Bessy Plan **\$3.99/ea**

SMALL BESSY HARDWARE KIT

You get 2 eyes, 2 nostrils, and 1 cow bell. Plan, wood and paint not included in kit.

#8621 Small Bessy Hdw. Kit **\$1.59/ea**

SAVE 10 or more **\$1.49/ea**



Welcome to Cattle "Cowndry"! Build your own herd of cows — one for each room of the house and several for the yard. And remember, you'll be getting FULL SIZE plans. This means you'll be able to easily transfer all curves and shapes directly onto your wood — no guesswork! You'll find all our projects easy to make and paint. "Join the roundup", order your plans and get started now!

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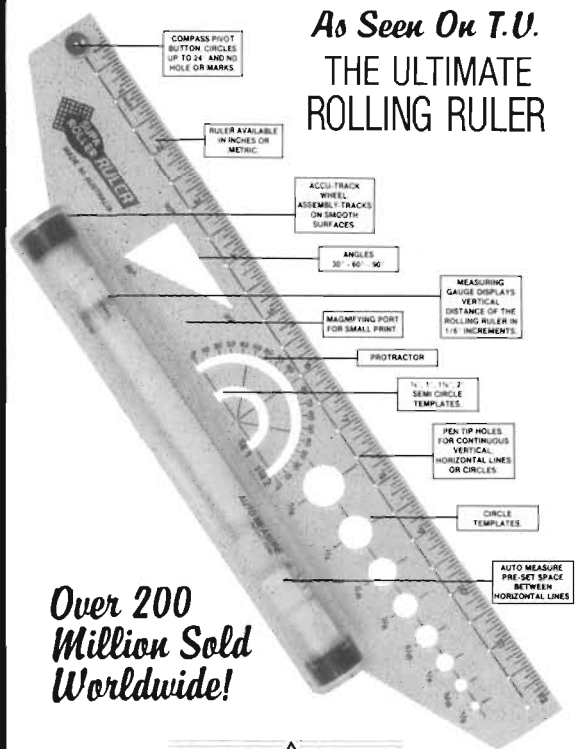
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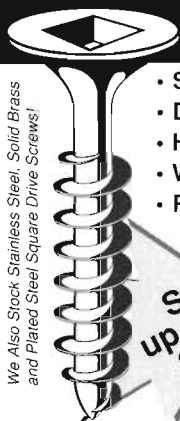
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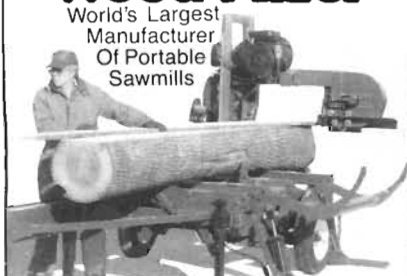
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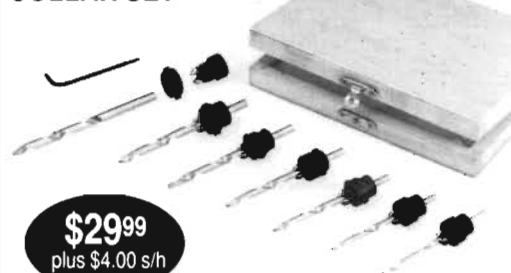
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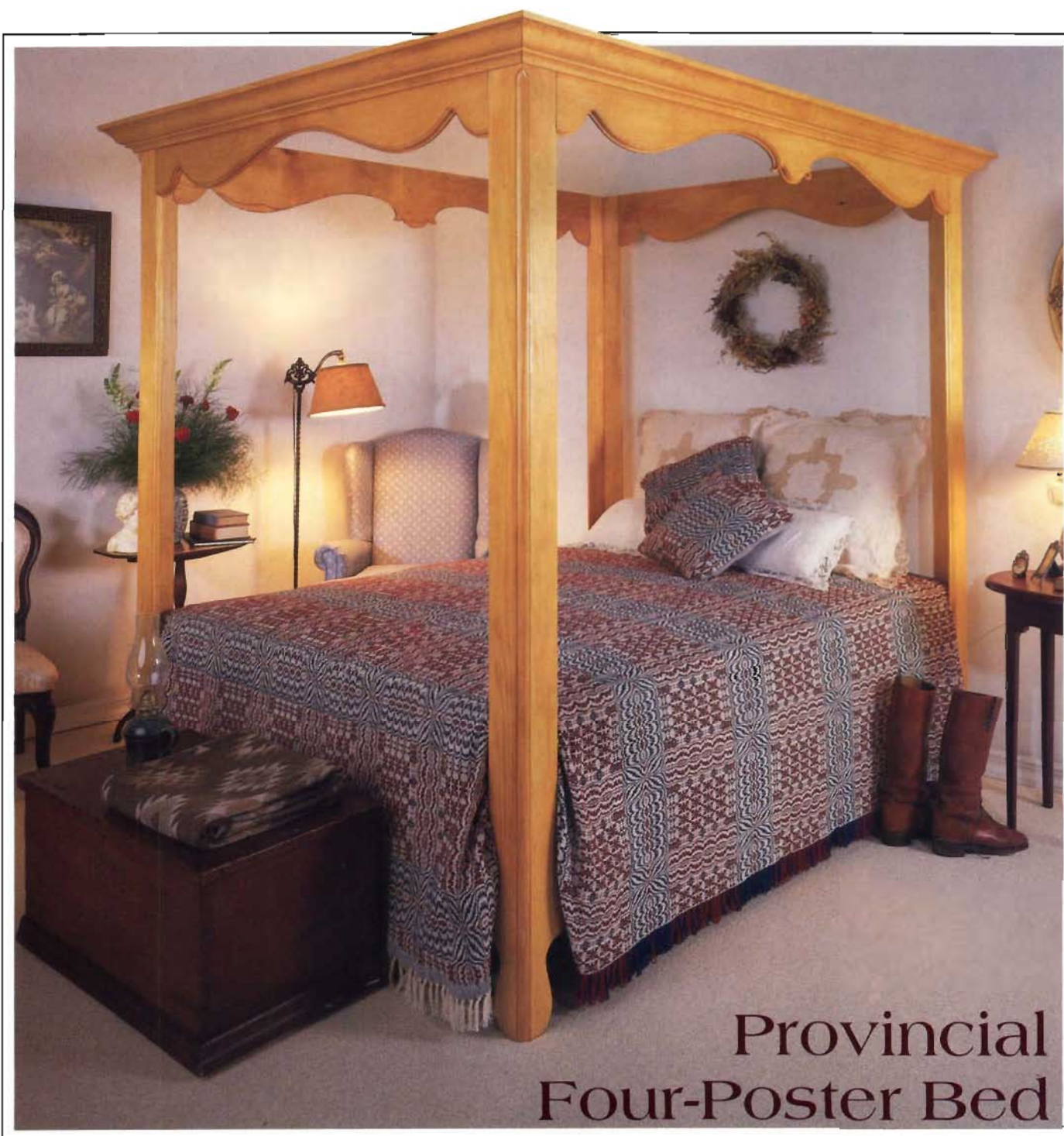
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Provincial Four-Poster Bed

If you've checked the furniture store circulars that usually come with the Sunday paper, chances are you know just how costly beds can be. Canopy-top four posters like ours usually sell for about \$1,000, and that's for the bed only, without the mattress and box spring.

For our bed, your materials expense should be less than \$200. That includes

\$29 for the bed rail fasteners (M), \$49 for 28 ft. of crown molding (H) at \$1.75 a ft., with the remaining \$122 for the pine. You can use no. 2 pine for the bed, but avoid boards with loose knots.

Our bed accepts a standard queen size box spring and mattress. Though we don't show a headboard and footboard, if you'd like to include these, just come up with a pleasing profile matching the

canopy top, leave a sufficient flat on the posts for mounting hardware, and order an extra set of bed rail fasteners.

Start by making the four posts. As shown in the Corner Detail, each post is actually a right angle formed by two $\frac{3}{4}$ in. thick pine boards joined with a simple tongue-and-groove joint. Although our Bill of Materials lists the two pine boards as a post side (A) and post

end (B), the orientation isn't important. Once assembled, the joint that's formed won't be easily seen.

To make the post, rip $\frac{3}{4}$ in. thick pine to $4\frac{1}{2}$ in. wide for the post sides, and to 4 in. wide for the post ends. Using the table saw and dado head, cut the dado in the post sides and the rabbet in the ends to form the matching tongue. Check your table saw setups on some scrap first, before committing your project stock. With the tongue-and-groove joint cut, apply glue and clamp securely. Use several 90-degree waxed blocks to keep the parts at a true right angle along their

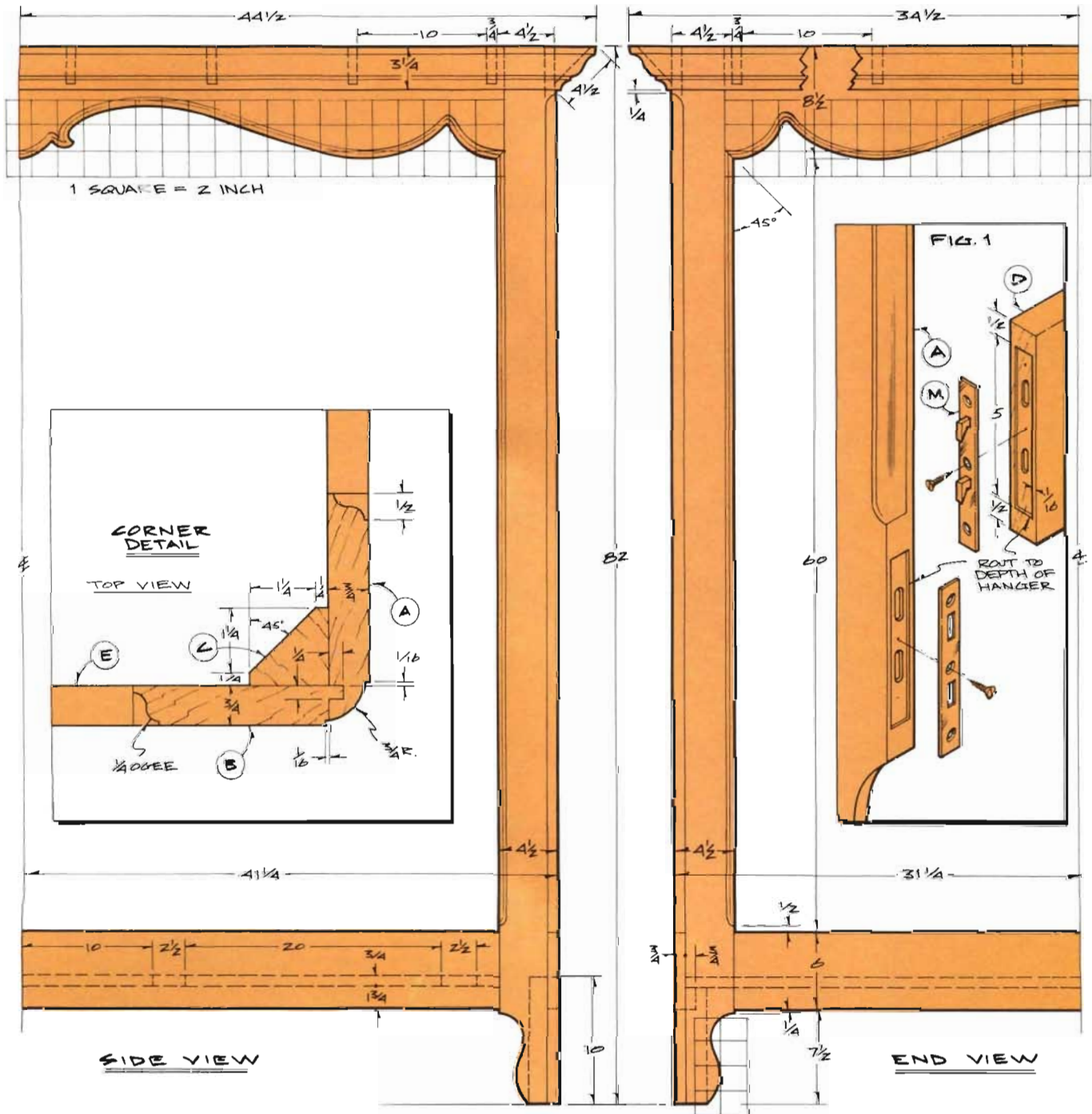
entire length.

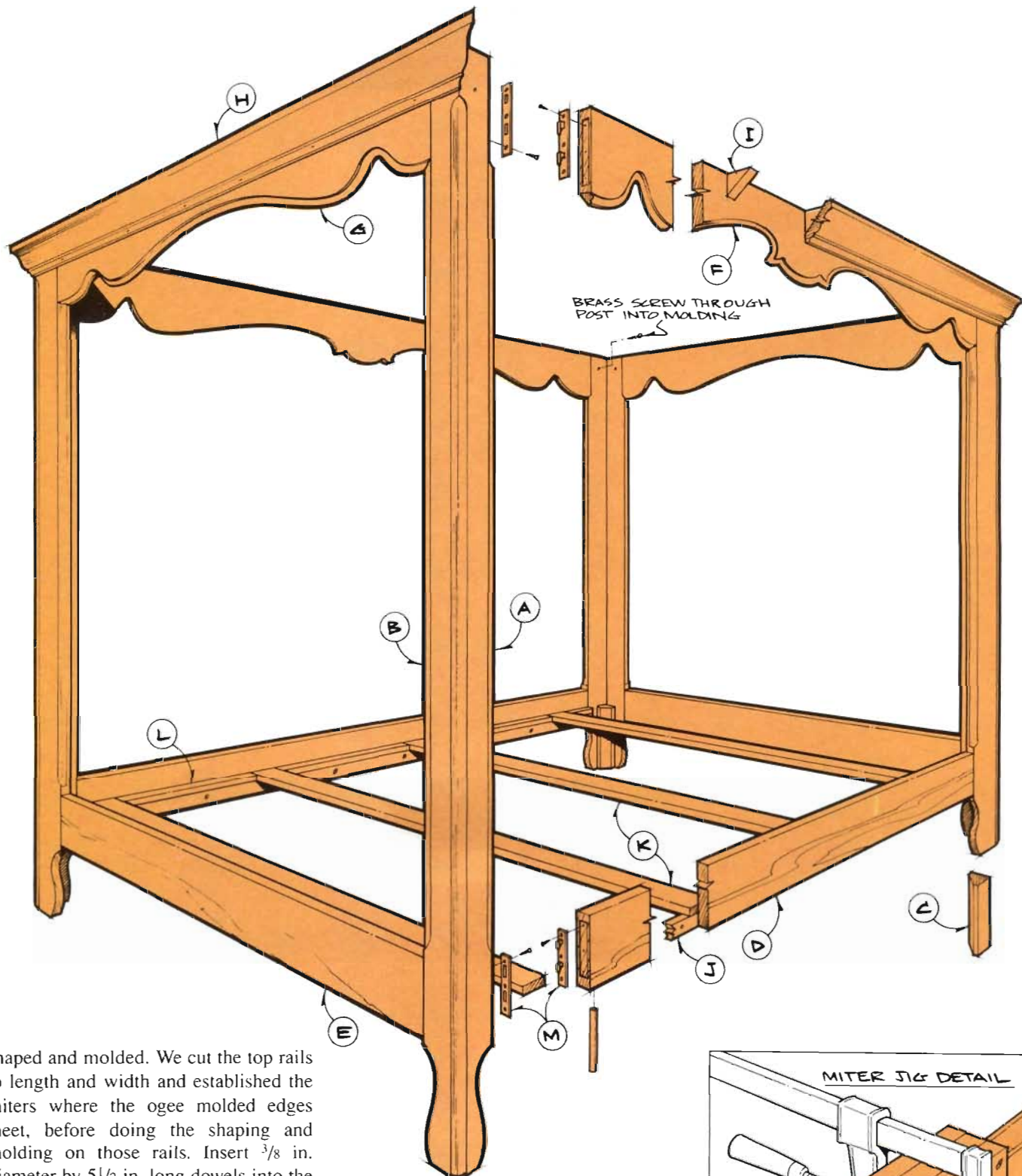
Once the posts are dry, lay out the $\frac{3}{4}$ in. radius bead on the corner, the ogee on the edges, and the foot profile. As shown on the Corner Detail, the $\frac{3}{4}$ in. radius bead, once cut, falls $\frac{1}{16}$ in. past the joint line. Don't worry about this. After the finish is applied, the joint line won't be noticed. Note that the bead is stopped $3\frac{1}{2}$ in. from the top of the post. The ogee starts 14 in. from the bottom end of the posts and runs to the top. Later, the top portion of the ogee is removed when the post edge is cut back and mitered to fit the top rails. Use the grid pattern

shown on the end view to transfer the foot profile.

For the router work, you'll need a router with a $\frac{1}{2}$ in. collet capacity. That's because the required $\frac{3}{4}$ in. radius ball-bearing guided router bit is only available with a $\frac{1}{2}$ in. shank. Establish the roundover and ogee molded edges, then cut the foot profile with a hand-held jigsaw. Sand to smooth the jigsaw cut on the foot profile, then cut the corner blocks (C) and glue in place.

Next, cut the rail stock to length and width. The bottom rails (D, E) are square edged, but both top rails (F, G) are

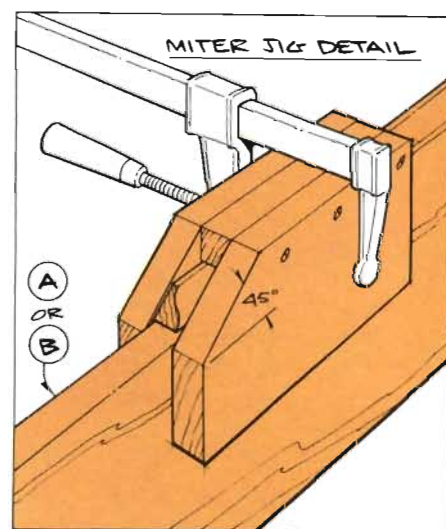




shaped and molded. We cut the top rails to length and width and established the miters where the ogee molded edges meet, before doing the shaping and molding on those rails. Insert $\frac{3}{8}$ in. diameter by $5\frac{1}{2}$ in. long dowels into the bottom edge of the bottom rails to anchor the bed hardware screws that would otherwise be fastened wholly in end grain.

There are several approaches to the fussy step of cutting the miters on the top rails and posts. You could make these miters with the table saw, but traditionally miters like this were cut by hand, using a simple shop-made jig (see Miter Jig Detail). The jig is just two

boards with 45-degree angles that are sandwiched around a third board. Clamp the jig to the piece being cut, make a rough cut with a sharp handsaw, then pare to the line with a chisel. The important thing with these miters is to locate them properly. For the miter on the posts, cut back the ogee as required, and establish the miter so it's a little long at first. Then test-fit the top rail. You can



then fine-tune the joint by paring back the miter until the top rail drops down flush with the top end of the post. Don't make the mistake of trying to get it right the first time. Remember, you can always cut back a little more stock, but once the stock is gone, it's a monumental task trying to stretch that board out!

To shape the top rails, transfer the profiles from the grid patterns and cut out with the jigsaw, then use rasps, files and sandpaper to smooth. Smoothing is an important step since the ball-bearing guided ogee bit will follow any bumps or gouges, causing the irregularities to be reproduced in the ogee molding. Take extra care with the router when you reach the miter on the top rails. If you let the bearing follow the miter at the end of the board, you'll round the end and ruin your crisp miter cut. An easy way to avoid this problem is to just guide the router off the end in a straight line. Or you can stop the ogee cut short of the miter and use files and sandpaper to continue the ogee profile to the miter.

With your rails shaped and molded, you'll need to cut the mortises for the bed rail fasteners (M) that hold the rails and posts together. Our bed is all

Bill of Materials

(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Post Side	3/4 x 4 1/2 x 82*	4
B	Post End	3/4 x 4 x 82	4
C	Corner Block	1 1/2 x 1 1/2 x 10	4
D	Bottom Side Rail	3/4 x 6 x 73 1/2	2
E	Bottom End Rail	3/4 x 6 x 53 1/2	2
F	Top Side Rail	3/4 x 8 1/2 x 74 1/2	2
G	Top End Rail	3/4 x 8 1/2 x 54 1/2	2
H	Crown Molding	5/8 x 4 1/2**	28 ft.
I	Molding Block	3/4 x 2 1/2 x 2 1/2	28
J	Cleat	3/4 x 1 3/4 x 73 1/2	2
K	Box Spring Support	3/4 x 2 1/2 x 61	4
L	Filler Strip	3/4 x 3/4	11 ft.
M	Bed Rail Fasteners	5/8 x 5***	16

* Width dimension before corner shaping.

** When buying, specify 4 1/2 in. crown molding. Note that the profile and dimensions of the molding your local lumberyard carries may differ slightly from that shown.

*** Available from Constantine's, 2050 Eastchester Rd., Bronx, NY 10461; tel. (800) 223-8087. Order part no. 96J10. Cost is \$7.25 for a set of four (you'll need four sets). Add \$4.75 for shipping.

knock-down, so every rail-to-post joint uses one of these fasteners, which amounts to 16 in all. With so many mortises to cut, you'll be well advised to build a simple jig (see Working with

Bed Rail Fasteners) for your router or laminate trimmer.

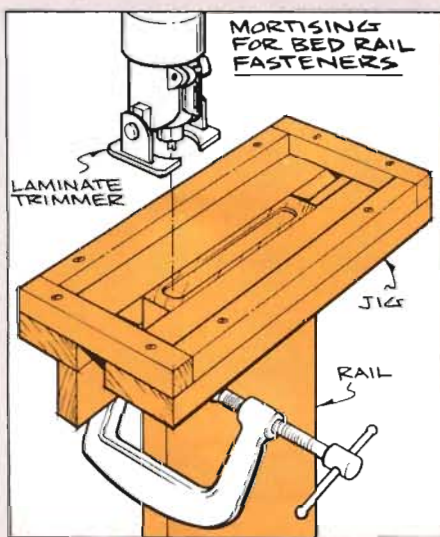
With the fasteners mounted and the bed assembled, add the crown molding (H). Most lumberyards carry a 4 1/2 in. crown molding similar to the profile shown. We glued molding blocks (I) to the crown molding and rails, and then inserted a brass screw through each post side and end to pull the miters up tight. The screws must be removed to disassemble the bed. Strips of wood, temporarily clamped to the top rails and even with the bottom edge of the crown molding, are an easy way to position the molding correctly while you are working on mounting it.

Next, add the cleats (J), box spring supports (K) and filler strips (L). The cleats and filler strips are glued and screwed in place, but the box spring supports just nest in the pockets between the filler strips.

The bed must be disassembled to apply the finish. We used three coats of orange shellac followed by a single coat of McCloskey Heirloom Clear Varnish, Eggshell no. 0032. The orange shellac adds just the right amount of color to the wood, making a stain unnecessary. 

Working with Bed Rail Fasteners

Before locating for the bed rail fastener mortises, you should take the hardware and see how the parts lock together. Note how the holes in the plate side of the hardware are offset toward the top. This little detail insures that both plates will be on the same plane when in the locked position. On most bed constructions, getting both parts of the hardware on the same plane isn't all that critical, since if you miss by 1/8 in., no one will notice. But that's not the case on the top rail-to-post joints for our bed. If both parts of the fastener aren't close to or exactly on the same plane, you could end up with an unsightly gap at the miters where the ogees meet. To insure a tight miter, cheat the prong side of the hardware (the half that's mounted to the top rails) up just a hair. Also, to avoid a fastener that locks tight before the prongs are fully seated, test-assemble each fastener before mounting. A few taps with the hammer will seat the prongs.



Mortising for bed rail fasteners may seem as easy as drawing a breath, but what looks easy can also be deceptive. We recommend that you use a jig (see Mortising For Bed Rail Fasteners detail) to rout the bed rail fastener mortises. Once located and clamped in place on the respective post or rail, the

jig insures an accurate, foolproof mortise for the fasteners. Given the narrow 1/16 in. lip remaining on either side of the 5/8 in. wide mortise, the jig is pretty much a must. As shown in Fig. 1, the mortises on the posts must also include two deep hollows to accept the two bed rail prongs. The mortises in the rails have two shallower hollows to fit the back of the prongs. Note that on the post mortises for the top fasteners, you'll probably need to clean out the part of the mortise nearest the miter by hand. The miter interferes with indexing the jig to cut the full mortise length.

With the mortises cut, test assemble the top rails by mounting each fastener plate with just a short center screw. That way, if you need to adjust the mortises and move the plate a little higher or lower, you'll still have the top and bottom screws to provide maximum hold. If the center screw hole overlaps the first, the longer screw should still find good hold.

Koa Jewelry Chest



This jewelry box, from P & D Designs of San Luis Obispo, California, is another in the line of fine contemporary work we've seen generated by West Coast craftsmen. We found the box at the Atlantic City Buyer's Market, one of the major craft fairs where woodworkers and other artisans sell their products to retailers.

The box combines a simple design with a unique modular drawer system. As shown in the exploded view, the basic box is just a top and bottom (A) sandwiched around ends (B). The ends are joined together and fastened to the top and bottom with splines (C). The photo shows a two-drawer chest, but you can add more drawers as needed. For each extra drawer add a pair of ends.

Like much contemporary work, the jewelry box relies on attractive woods for its appeal. This box is a combination of just two woods, koa (a Hawaiian

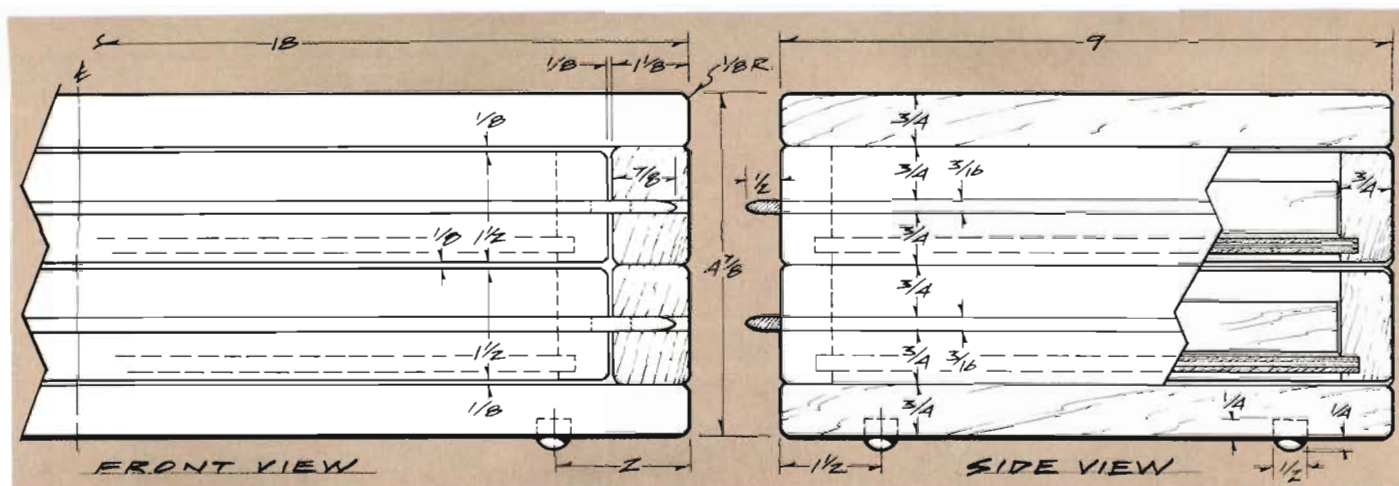
wood) and padauk. Koa is easy to work and has a multitude of lovely grain patterns, and padauk, with its distinctive deep red color, adds contrast. The padauk is used for the center lamination in the end sections, for the stops (D), and for the drawer pulls (I). This arrangement makes the padauk accent pieces and pulls appear as a continuous stripe of padauk in a body of koa. If you prefer you can substitute contrasting domestic hardwoods or other combinations of exotics for the koa and padauk.

Start by laminating enough stock for the ends. As the elevation shows, the end lamination is a sandwich of two $\frac{3}{4}$ in. thick by $1\frac{1}{8}$ in. wide strips around a $\frac{3}{16}$ in. thick center. You can make the lamination as individual ends, but it's easier to laminate longer lengths and then crosscut them to length. At the very least, laminate enough stock for a pair of ends at a time. This will insure consis-

tency in each pair. Note that the center strips are also sized to the $1\frac{1}{8}$ in. width at this time. The groove for the stops isn't cut until later.

While waiting for the end laminations to dry, make the remaining parts. Cut the top and bottom to size and round the ends and edges. Now's also a good time to cut your splines and stops to size. The stops are cut from the same $\frac{3}{16}$ in. thick stock that you used for the center laminations, but the splines are $\frac{1}{4}$ in. thick and can be cut from any hardwood scrap stock. Take careful note of the grain direction of these parts. Splines should always be cut so the grain runs perpendicular to the joint. The stops are cut so the $\frac{5}{8}$ in. dimension is the length, not the width.

Also cut the drawer parts to size. Start with sufficient $\frac{3}{4}$ in. thick by $1\frac{1}{2}$ in. wide material for the drawers you'll need. The same stock is used for the



drawer front and back (E) and the sides (F). Set the dado head for a $\frac{1}{4}$ in. wide by $\frac{1}{4}$ in. deep cut, position the rip fence $\frac{1}{8}$ in. away from the dado head, and establish the groove for the $\frac{1}{4}$ in. thick plywood drawer bottom (G). As you'll note from the elevations and the Bill of Materials, the drawers are sized so there's a $\frac{1}{8}$ in. space all around. With normal case construction, where you'll be trying to achieve drawer clearance tolerances of about $\frac{1}{16}$ in. to $\frac{1}{32}$ in., the drawers are made and sized after the case is assembled. But with the generous $\frac{1}{8}$ in. allowance, which is an important design element on this box, you can cut and assemble the drawer parts now. This also helps minimize blade switching in the table saw later.

Miter the ends of the drawer front, back and sides, and then glue up the parts around the bottom. Note that our Bill of Materials dimensions assume a perfect fit of the bottom in the grooves. In practice, you should size the bottom a little less than the actual groove-to-groove dimensions. This way you'll avoid a situation where a bottom that's too big could prevent the miters from closing up tight at the corners. Be sure to use plenty of glue at the miters, where the 50 percent end grain joint will absorb it readily. For a strong joint here, it helps to apply two layers of glue to each end. Wipe on a first application with a putty knife, forcing the glue into the end-grain pores. Wait a few minutes, then apply a second layer of glue before assembly. You'll need a band clamp with four

Bill of Materials

(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Top/Bottom	$\frac{3}{4}$ x 9 x 18	2
B	End	$1\frac{1}{8}$ x $1\frac{1}{16}$ x 9	4
C	Spline	$\frac{1}{4}$ x 3 x $\frac{1}{2}$	6
D	Stop	$\frac{3}{16}$ x 1 x $\frac{5}{8}$	8
E	Drawer Front/Back	$\frac{3}{4}$ x $1\frac{1}{2}$ x $15\frac{1}{2}$	4
F	Drawer Side	$\frac{3}{4}$ x $1\frac{1}{2}$ x 9	4
G	Drawer Bottom	$\frac{1}{4}$ x 8 x $14\frac{1}{2}$	2
H	Divider	$\frac{7}{8}$ x $\frac{1}{2}$ stock As Req'd	
I	Pull	$\frac{3}{16}$ x $\frac{3}{4}$ x $17\frac{1}{2}$	2
J	Foot	$\frac{1}{2}$ dia. x $\frac{1}{2}$ long	4
K	Liner	Felt	As Req'd

* Number required is for a box with two drawers.

90-degree corner pieces to hold the drawer parts in place while the glue dries.

While the drawers are in clamps, cut the dividers (H) to size. Run off enough $\frac{1}{8}$ in. thick by $\frac{1}{2}$ in. wide stock as needed for the number of drawers your box will have, then lay out as needed for the jewelry collection that will be housed there. The layout shown is only a suggestion; for a ring storage drawer you'll want to use a 1 in. square grid.

With the end laminations and the drawers dry and out of clamps, you can cut the grooves for the stops and drawer pulls. Set the dado head for a $\frac{3}{16}$ in. wide by $\frac{1}{4}$ in. deep cut. Locate the rip fence $\frac{3}{4}$ in. from the blade for the grooves in the end laminations, then reset the rip fence $\frac{5}{8}$ in. from the dado head for the grooves in the sides and

front of the drawers. But when cutting these grooves, gauge off the top edge of the top drawer and the bottom edge of the lower drawer. This will maintain the $\frac{1}{8}$ in. space between the drawers. Note that if you have three or more drawers, for the middle drawer or drawers you'll want to locate the groove dead center on the $1\frac{1}{2}$ in. drawer height. The distance between the middle drawers will work out to a little more than $\frac{1}{8}$ in., but your eye won't pick up the variance in spacing. After the grooves are cut, radius the edges of the drawers as shown.

You are now ready to assemble the box. Using the router table and a $\frac{1}{4}$ in. diameter straight cutter, establish the spline grooves in the top, bottom, and end laminations. You'll need to set up stops about 12 in. apart (each stop 6 in. from the bit) to produce the 3 in. long spline groove. You can use a $\frac{1}{4}$ in. chisel and square the ends of the spline grooves, as our illustrations show, or just leave the groove ends round, and round the ends of the splines to fit. Radius the edges of the end laminations, and glue the parts together.

Now glue the stops in place. Note that the four stops for each drawer actually serve both as guides and stops. Two are glued into the grooves in the end laminations, flush with the front; the other two are glued into the grooves in the drawer sides, flush with the back.

Once the box and stops have dried, you can mount the drawers. The drawers slide in from the back. After the pulls are mounted, the drawers will be perma-

Christmas Angel Folk Carving

By Rick and Ellen Bütz

The angel has been a favorite woodcarving subject for several hundred years. In early America, carved angels like the one shown here were often seen in the form of weathervanes. Frequently they were placed atop church steeples, where they were considered more appropriate than secular subjects like horses and grasshoppers.

Historically, angels have been regarded as heavenly messengers. They appear several times in the story of the Nativity. Today they symbolize for us the joyous spirit of Christmas, bearing its message of Peace and Hope.

This project is an example of shallow relief carving where a silhouette shape is rounded and then detailed. I have listed the tools that I use on this woodcarving as a guide. But don't feel that you must have exactly the same tools as those listed to make the carving. Tools of similar size and shape can be substituted. And it is even possible to do the carving with just a knife, although it will take longer.

To begin, use our full-size pattern to trace the design onto a piece of $\frac{3}{4}$ in. thick by 5 in. wide by 13 in. long basswood. Be sure to lay the pattern out so that the grain runs the length of the angel. This will provide strength for the delicate parts like the horn and feet.

Next, cut out the profile with a band saw or coping saw. Then drill two $\frac{1}{4}$ in. holes through the openings on each side of the arms. This allows you to put the blade of a coping saw through

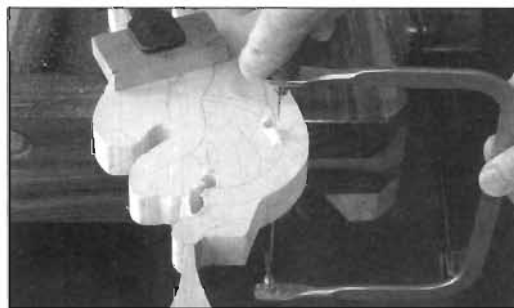
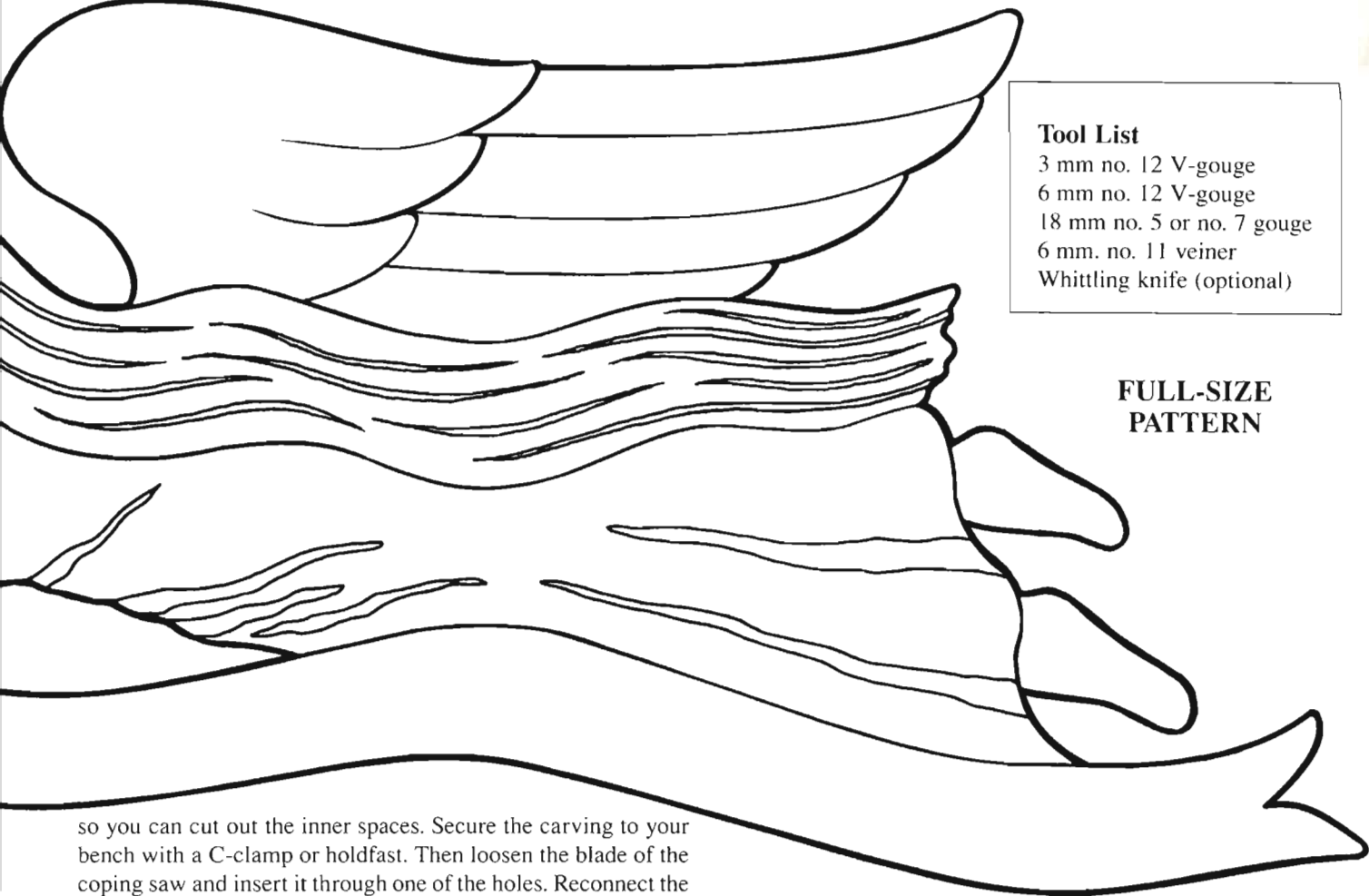


Photo 1





Tool List

3 mm no. 12 V-gouge
6 mm no. 12 V-gouge
18 mm no. 5 or no. 7 gouge
6 mm. no. 11 veiner
Whittling knife (optional)

FULL-SIZE PATTERN

so you can cut out the inner spaces. Secure the carving to your bench with a C-clamp or holdfast. Then loosen the blade of the coping saw and insert it through one of the holes. Reconnect the blade to the saw and cut out the excess wood around the arms (Photo 1).

Start carving by outlining the hair, banner, and feet with a 6 mm no. 12 V-gouge (Photo 2). Make the cuts about $\frac{1}{8}$ in. in depth. You may have to make more than one pass with the V-gouge to do this.

Next, bevel down the wing to the level of the V-cut with an 18 mm no. 5 or no. 7 gouge, leaving the hair raised (Photo 3). At this stage remember that you are just establishing the basic levels of the carving, and the detailing will be done later. Then bevel down the robes, leaving the banner raised (Photo 4).

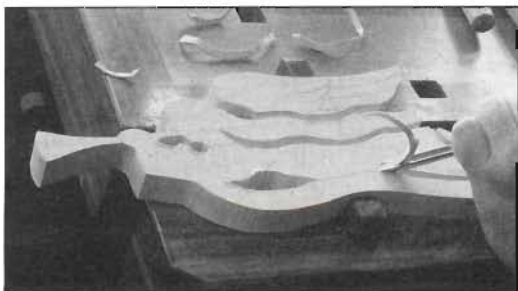


Photo 2



Photo 3

Bevel down the sleeve area to the banner in the same way. Be sure to leave the hand area raised.

Outline the sleeve opening with the 6 mm V-gouge (Photo 5). Bevel the wrist down to the cut with the 18 mm no. 7 gouge (Photo 6). Outline the bottom edge of the wrist with the



Photo 4

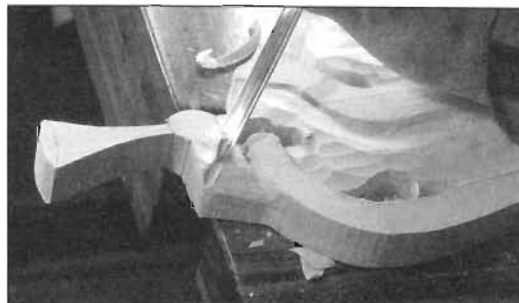


Photo 5

V-gouge. Carve away the wood inside the sleeve with the 18 mm no. 7 gouge (Photo 7). These steps can be repeated if necessary to take the wood down in stages to the depth you want. A whittling knife with a small, sharp blade may also be helpful for carving the lower wrist and sleeve area.

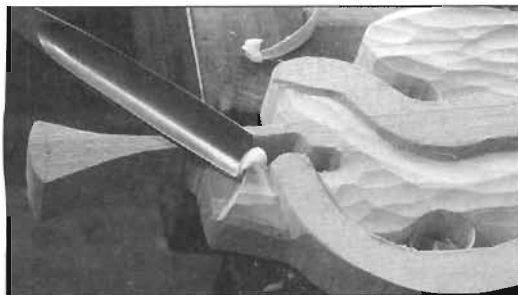


Photo 6

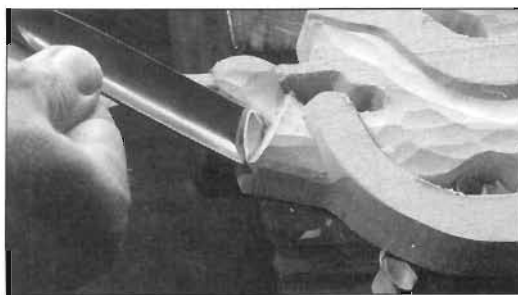


Photo 7

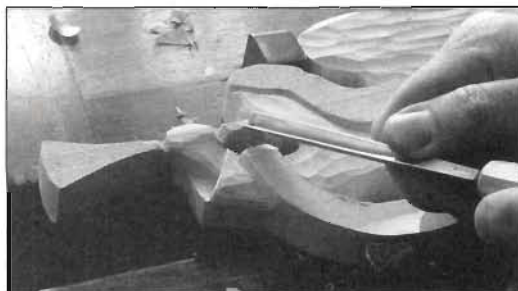


Photo 8

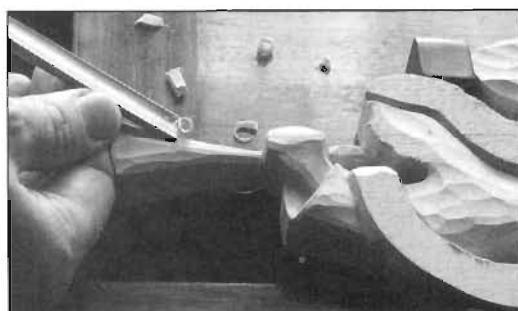


Photo 9

Next, outline around the hand and in front of the lips with the V-gouge (Photo 8). Be sure not to cut too close to the face at this point. You want to leave enough wood for detailing the lips later. Now round the horn (Photo 9). You can use the same 18 mm no. 5 gouge or the no. 7 gouge to do this, but if you have a flatter gouge, like a no. 3, it will leave smoother cuts. Because the section of the horn in front of the face is small and delicate, you can use a smaller gouge or even a knife to round it.

After the horn is rounded, redraw the lines for the opening of the horn. Then use the V-gouge to outline the opening. Make the cut deeper in the middle than at the outside edges. Bevel away the excess wood inside the horn opening with the no. 7

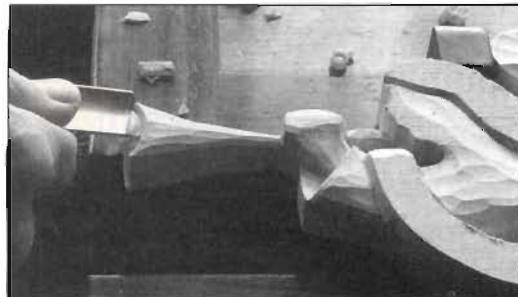


Photo 10

gouge (Photo 10). In tight areas you can use just the corner of the tool to make the cuts; it functions almost like a knife point.

When the horn is shaped, round the hand with the no. 7 gouge. Remember, this is a folk carving, so don't worry about putting a lot of detail into the shape of the hand. Once again, the corner of the tool is useful for the tight areas where the hand

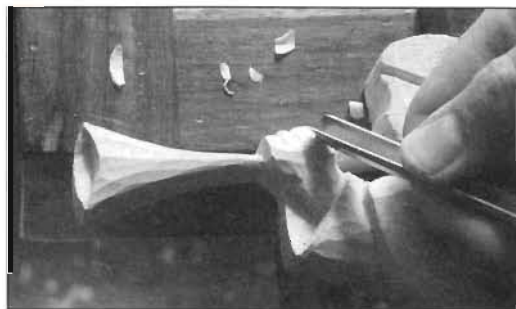


Photo 11

joins the horn. Then carve three shallow lines with the V-gouge to suggest fingers (Photo 11).

Begin the head by slightly rounding the face with the no. 7 gouge. Use the same tool to round the hair at the top of the head (Photo 12). Use the V-gouge to make a shallow line for the hairline.

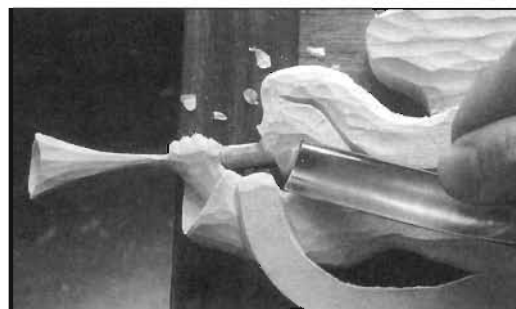


Photo 12

To shape the face use a 6 mm no. 11 veiner. This is a "U" shaped tool that was originally designed to carve the veins in Gothic-style leaves centuries ago. I use a veiner for these cuts rather than a V-gouge to give the soft, rounded contours representative of a female face.

Make a shallow, rounded notch where the eye will be placed. Leave the upper part of the cheek high and rounded. This makes it look as though the angel's cheeks are puffed out blowing the



Photo 13

horn. I've found the secret to carving faces is to remove the wood with many small shallow cuts rather than one large one (Photo 13).

Next, use the veiner to carve an arc around the front of the cheek to define the nose and lips (Photo 14). To detail the mouth and eyelids use a 3 mm no. 12 V-gouge (Photo 15). Once again, remove only tiny amounts of wood at a time.

Use the veiner to carve away wood below the jaw line to shape the neck. Use a V-gouge to incise a line creating the neckline of the robe (Photo 16).



Photo 14



Photo 15



Photo 16

Contour the banner with the no. 7 gouge. This is an optional step and simply involves making the banner lower in one or two places to give the impression that it is flowing in the wind.



Photo 17

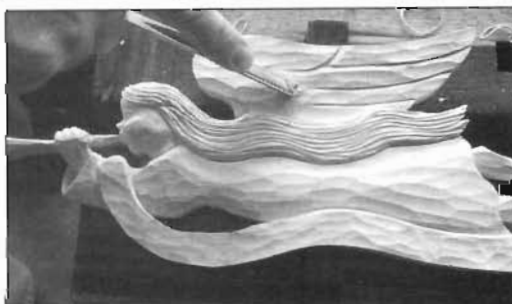


Photo 18

Be careful as you carve the hollows to work with the direction of the wood grain. If the wood begins to splinter and you feel the tool "dig in," stop carving and approach the cut from the opposite direction (Photo 17). Then, with the same tool, bevel down and shape the slippers.

Now use the 6 mm V-gouge to create the hair texture, following the wavy contours. The hair will look more natural if you don't try to make your cuts too precise. Then outline the feathers on the wing (Photo 18).

The next step is to make the folds in the robe. I always draw them on with a pencil first. Make the lines slightly curved to enhance the flowing feeling of the robe. Don't draw in too many folds, you can always add more later. Then use the no. 11 veiner to carve the folds. The "U" shape will create a soft texture that looks like cloth (Photo 19).

Now the angel is ready to paint. First seal the carving with a coat of Krylon Acrylic Spray Coating No. 1301. You can also use spray lacquer. This keeps the water-based acrylic paint I use on this carving from soaking too deeply into the basswood. For



Photo 19

working with acrylic I like white sable brushes. Synthetic bristles do not soften in water the way natural sable bristles do. Also, the acrylic paint washes out of sable brushes easily. Acrylic paints and sable brushes are available at art supply shops.

You can paint your angel any colors you like, but these are the ones I use. The flesh tone is titanium white with a tiny bit of burnt sienna. The robe is straight titanium white. The wing is cadmium red medium and titanium white. The hair is cadmium yellow medium lightened slightly with titanium white. The banner is ultramarine blue and titanium white. The horn and slippers are painted gold.

After the paint has dried, you can glaze the angel to give it an antique look. In the glazing process, you brush a coat of stain over the carving and then quickly wipe it off. This leaves a trace of stain in the depressions of the carving, softening the colors



Photo 20

and giving the angel a slightly weathered look, like a piece of Early American folk art.

Before you stain the carving, brush a coat of boiled linseed oil over the surface and wipe off the excess. The thin film of oil remaining on the carving will make it easier to control the amount of stain you leave on the carving. Then brush on a coat of dark oil-based stain. I use Minwax Special Walnut. Use a clean lint-free cloth to wipe the stain off (Photo 20).

To display your angel, simply screw a small screw eye into the top edge of the wing, and hang it on a wall or doorway. This woodcarving makes a very attractive decoration or heirloom gift of the season.



In our ever more technical world it seems as though there's a measure or measuring device for just about everything. But gladly there's no device that can measure—much less contain—the joy and delight young hearts will know when this treasure is spied beneath the tree on Christmas morn.

Our classy Rocking Dolphin is built entirely of no. 2 common pine, easily available at your lumberyard. Select stock that has few knots, and check that any knots are tight. Avoid boards that include pith (the center of the tree) since they are the most likely to cup. As for what size boards to buy, both the waves (A) and the seat (D) can be cut from a 1 by 10 board measuring $\frac{3}{4}$ in. thick by $9\frac{1}{4}$ in. wide by 8 ft. long. A length of 1 by 8, measuring $\frac{3}{4}$ in. thick by $7\frac{1}{4}$ in. wide by 4 ft. long will yield the kickboard (E), footrest (F) and the cleats (G). For the dolphins (B) and seat back (C) you'll need to edge-glue narrow stock to get the indicated width. Many combinations will work, but an easy way to get both of the dolphins and the seat back from the same board is to edge-glue 8 ft. lengths of 1 by 10 and 1 by 8. Since a 1 by 10 actually measures $9\frac{1}{4}$ in. wide and a 1 by 8 actually measures $7\frac{1}{4}$ in. wide, even after jointing the surfaces to be edge-glued, you'll have more than the

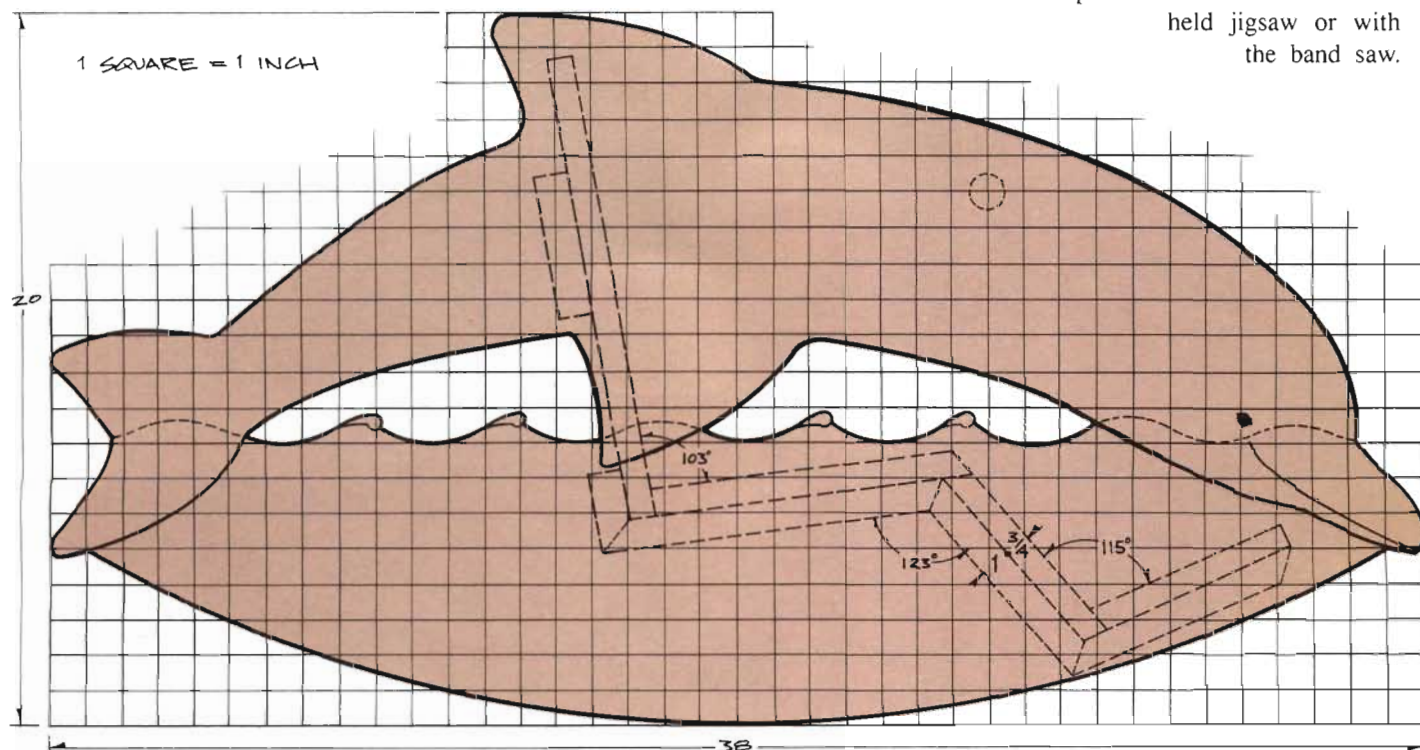
Rocking Dolphin



$15\frac{1}{4}$ in. width needed for the dolphin. The 8 ft. length will easily yield both of the dolphins and the seat back.

Once your stock is prepared, transfer the patterns for the waves and dolphins. The simplest system here is to lay out a 1 in. grid on cardboard, pencil in the

wave and dolphin using our grid patterns as a guide, and then cut out the profiles. You can then use the cardboard patterns to trace the profiles directly to the stock. Try to avoid knots in the dolphin's fins or tail, where they'll create a weak section that could easily break off. The profiles are cut with a hand-held jigsaw or with the band saw.



Files and sandpaper are then used to smooth and fair the shape to its finished form. A neat way to insure uniformity in the matching parts is to clamp them together for this final smoothing and shaping step.

With the waves and dolphins made, cut the remaining parts to size. You could lay out the locations of the seat back, seat, kickboard and footrest on the wave sections, screw the cleats in place, and then use your bevel square to get the angles that you'll rip on the various edges, but it's easier to just cut the angles first. Use the angles shown on the grid pattern to set your table saw blade, then rip the edges to establish width.

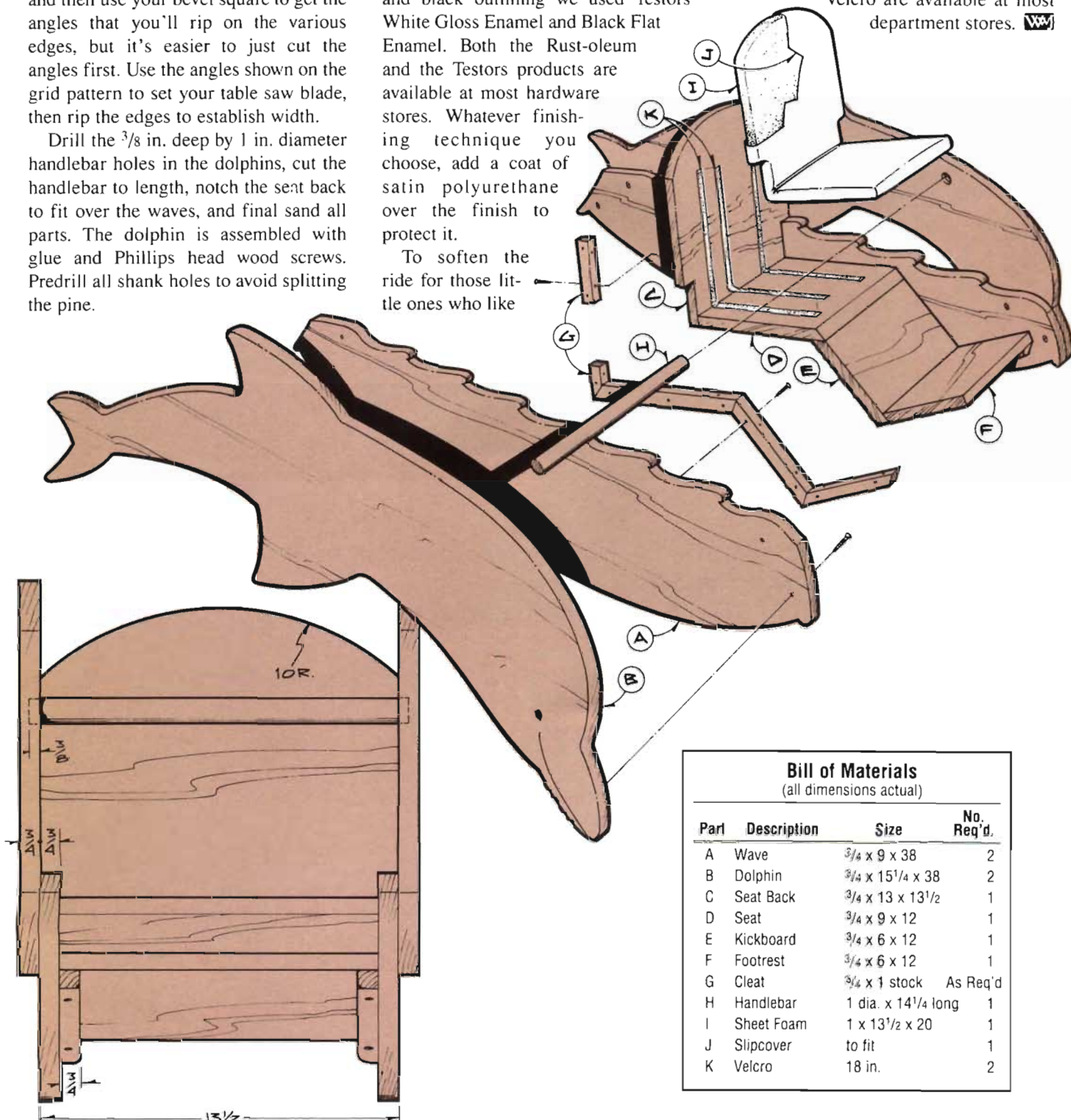
Drill the $\frac{3}{8}$ in. deep by 1 in. diameter handlebar holes in the dolphins, cut the handlebar to length, notch the seat back to fit over the waves, and final sand all parts. The dolphin is assembled with glue and Phillips head wood screws. Predrill all shank holes to avoid splitting the pine.

For a finish, you can either paint the piece as we did with a wipe-on and wipe-off technique that allows the wood grain to show through, or paint the piece with acrylics, or use a stain. We used Rust-oleum Royal Blue for the water and Rust-oleum Smoke Gray for the dolphin. By just wiping a very light coat of the paint over the wood, the grain can still be seen. Thin the paint if it seems to go on too thick. For the whitecaps, eye and black outlining we used Testors White Gloss Enamel and Black Flat Enamel. Both the Rust-oleum and the Testors products are available at most hardware stores. Whatever finishing technique you choose, add a coat of satin polyurethane over the finish to protect it.

To soften the ride for those little ones who like

to rock long and hard, we've added an optional cushion. Use 1 in. thick sheet foam rubber (I), wrapped with a fabric slipcover (J) of your choice. Notch the cushion to match the seat back. Velcro strips (K) secure the cushion to the seat. Note that Velcro comes in two parts. Use contact cement and staples to anchor the base part of the Velcro to the wood, and a needle and thread to sew the mating strips to the fabric. The foam, fabric and

Velcro are available at most department stores. 



Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Wave	$\frac{3}{4}$ x 9 x 38	2
B	Dolphin	$\frac{3}{4}$ x $15\frac{1}{4}$ x 38	2
C	Seat Back	$\frac{3}{4}$ x 13 x $13\frac{1}{2}$	1
D	Seat	$\frac{3}{4}$ x 9 x 12	1
E	Kickboard	$\frac{3}{4}$ x 6 x 12	1
F	Footrest	$\frac{3}{4}$ x 6 x 12	1
G	Cleat	$\frac{3}{4}$ x 1 stock	As Req'd
H	Handlebar	1 dia. x $14\frac{1}{4}$ long	1
I	Sheet Foam	1 x $13\frac{1}{2}$ x 20	1
J	Slipcover	to fit	1
K	Velcro	18 in.	2



Walnut Hand Mirror *with Mother-of-Pearl Inlay*

Our hand mirror—shown in walnut—makes a great gift. We've decorated the mirror back with a genuine mother-of-pearl flower inlay (see Special Techniques on page 35 for complete inlay instructions). Inlay is often thought of by woodworkers as being beyond their capabilities, but we believe you'll be pleasantly surprised at how easy the process actually is. Of course, should you prefer to leave the inlay off, the mirror still makes a great project.

To make the mirror just follow our simple step-by-step illustrations. Our

method incorporates a router, a router guide bushing, and a template to rout the mirror glass recess, but you can also just trace the mirror shape directly on your stock and rout the recess freehand. The advantage of the template method is that there's no chance for a slipup, and once you've made the template it's easy to knock out as many mirrors as you like.

You won't find the beveled glass that our mirror sports at your local glass shop, so we've arranged for a mail-order source. The 4 in. by 6 in. oval glass is available from Floral Glass and Mirror, 895 Motor Parkway, Hauppauge, NY

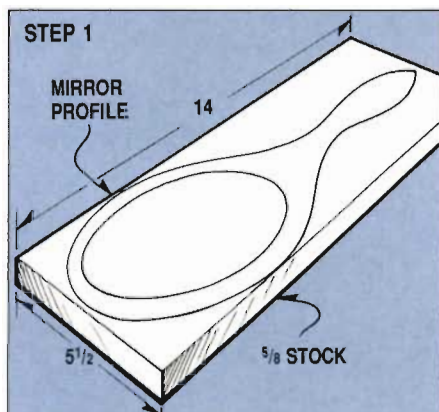
11788; tel. (800) 647-7672. There is a \$50 minimum order requirement, but at \$6.20 per glass (order their part no. OV 46) you'll have enough glass for eight or nine mirrors. Using our template method, making even that many mirrors requires only a few hours (not counting the inlay work). If you'd like to save a little money, most glass shops can cut a flat (no bevel) oval mirror for under \$5.

Step-by-Step

Step 1: Size your stock and lay out the mirror profile. We used a $\frac{5}{8}$ in. thick blank to lighten both the look and weight

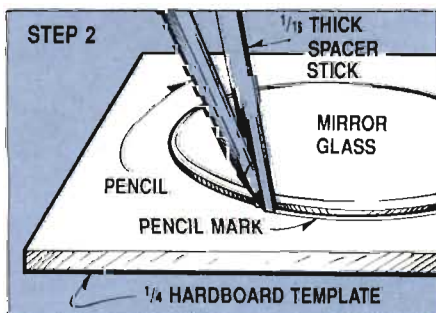
of the mirror, but $\frac{3}{4}$ in. thick stock would also be fine.

Transfer the full-size pattern of the handle and the half-pattern of the mirror body to your stock. You can use carbon paper and trace directly from the patterns to the stock, or you can just make a photocopy, paste it onto some stiff cardboard, cut the profile out, and then trace around it. If you make the template,



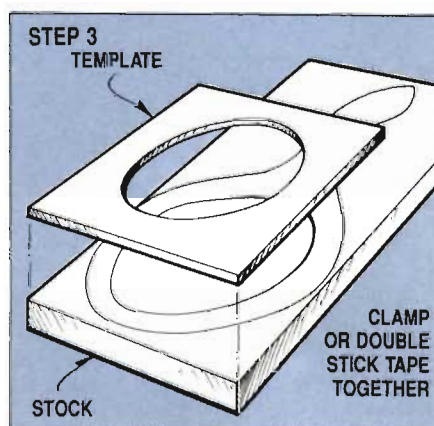
be sure to also cut out the center, since you need to mark the mirror glass position on the stock. When making multiples, a cardboard or hardboard template simplifies the task of transferring the profile to your stock. An easy way to get the full pattern of the mirror body is to just fold the photocopy along the center line, cut and unfold. Note that the contoured handle is for a right-hand grip. Reverse the pattern for a left-hand grip.

Step 2: Transfer the mirror glass profile to your template material. You'll need to size the template with respect to the size bit and guide bushing you'll use with the router, and an easy way to get the template right is to use a spacer when tracing around the mirror. We used a $\frac{5}{8}$



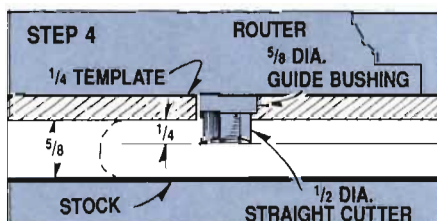
in. diameter guide bushing with a $\frac{1}{2}$ in. diameter bit, requiring that the template be $\frac{1}{16}$ in. larger all around than the mirror recess. As shown, we cut a $\frac{1}{16}$ in. thick spacer stick to use when tracing around the mirror glass. You can hold the pencil (make sure it's sharp) and spacer strip tightly together as you trace around the mirror glass, or if you find holding both a little difficult, wrap some tape around them. In either case, be sure to keep the pencil point flush with the side of the spacer strip as you trace around the glass.

Step 3: Fasten the template in place. But first it's important that the template be centered on the mirror recess. Check the position of the template relative to the inside profile on the stock, and adjust if needed. If your template is large enough, you can use clamps to anchor it

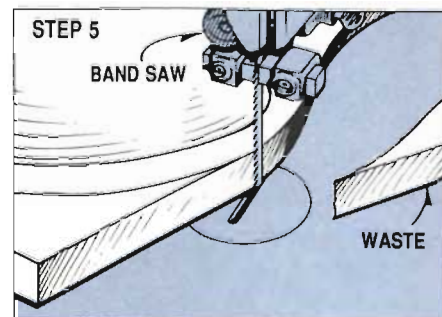


to the stock, but keep the clamps close to the corners so as to not interfere with the router base. Doublestick tape or countersunk screws are an option if the clamps interfere with the router.

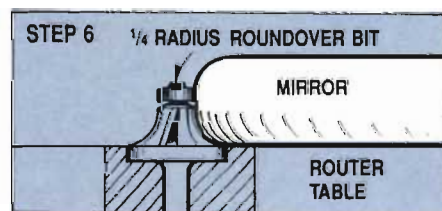
Step 4: Rout the mirror glass recess. Start at the center and work out. The $\frac{1}{4}$ in. recess depth that we use allows the 3 mm thick mirror glass to be slightly inset. That way the glass won't get scratched when the mirror is turned face



down to display your mother-of-pearl handiwork. Achieve the $\frac{1}{4}$ in. recess depth in two passes.



Step 5: Cut the outside profile. Use the band saw, handheld jigsaw or a coping saw. Use files to smooth any irregularities and remove the saw marks. It's important that the edge be smooth for the next step.

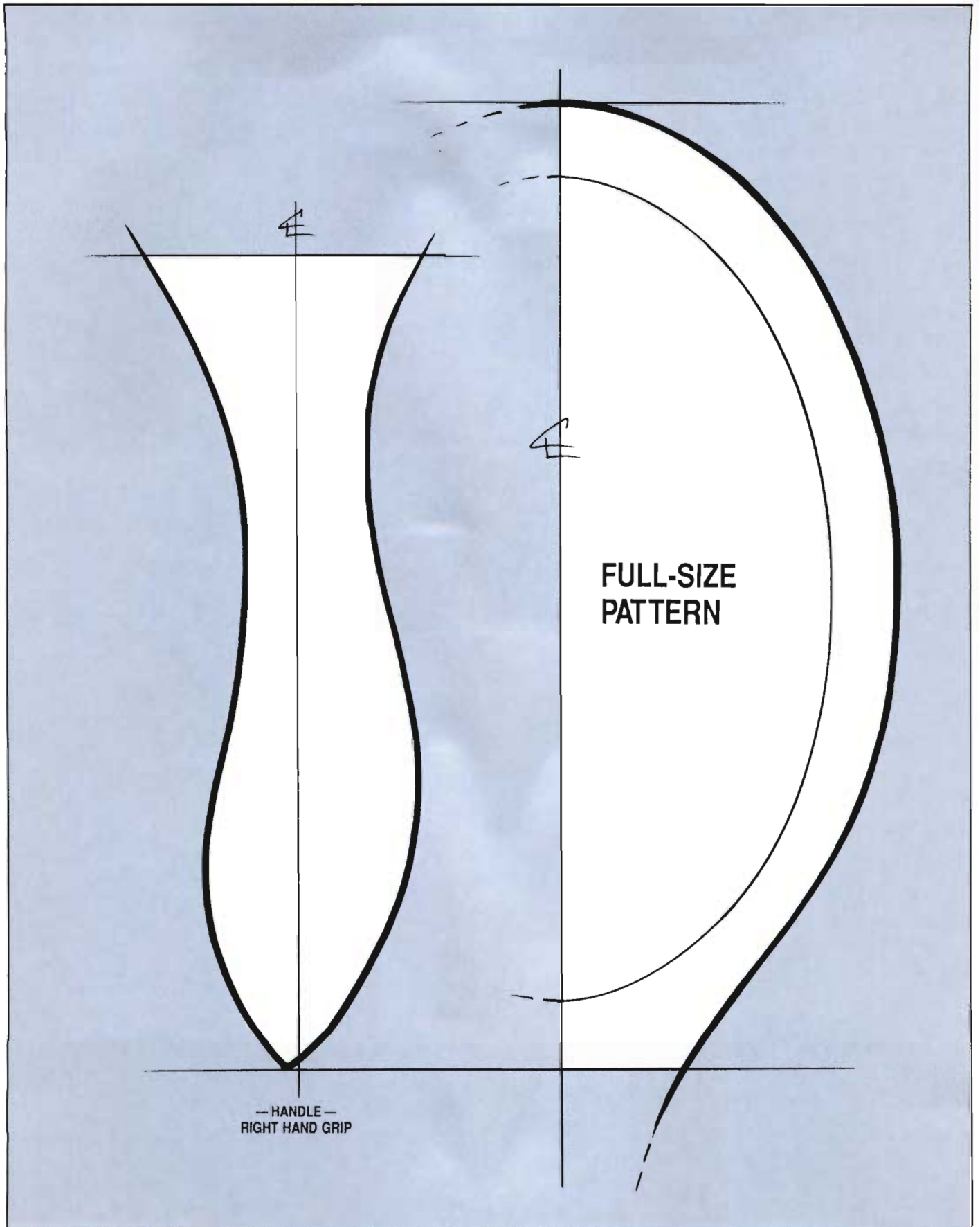


Step 6: Radius the edges. We used the router table with a $\frac{1}{4}$ in. radius ball-bearing guided roundover bit. Round one edge, then flip the mirror over to round the other edge. Final sand with 320-grit sandpaper.

Finishing Up

If you've decided to do the mother-of-pearl inlay, now's the time. With the inlay complete, final sand and finish. Our mirror has four coats of Deft spray lacquer, sanded between coats. Danish oil or tung oil would be another excellent finishing option. But take care not to get any finish inside the mirror recess.

The mirror is bedded in a special "mirror mastic," which like the mirror glass is available from Floral Glass & Mirror (\$4.95 for a 5-ounce squeeze tube). Most glass shops also carry mirror adhesives. Don't try mounting the mirror with a standard adhesive or epoxy. Depending on their chemical formulation, these products may dissolve the reflective silver on the mirror back. 



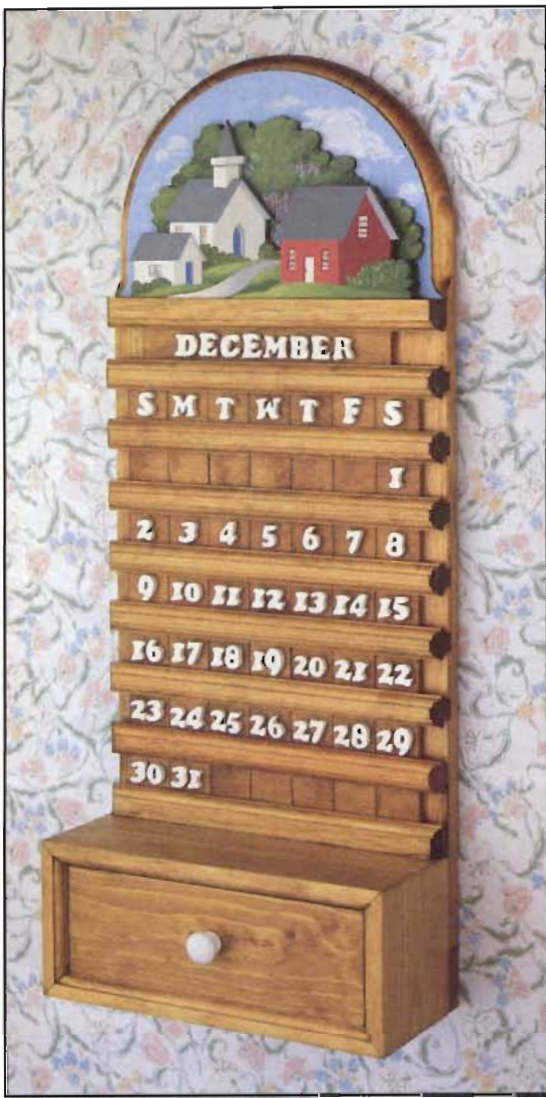
Perpetual Calendar

Our Perpetual Calendar is a welcome relief from the annual ritual of changing calendars. And it's a bit more elegant than the paper calendars that boast a pretty picture but also trumpet the local bank or insurance agency. In the kitchen or family room it's a unique and attractive way to keep count of the days.

The calendar may look complicated, but it's easy to make. We've arranged for a mail-order source to supply a kit with all the letters and numbers that you'll need (see Bill of Materials for price and ordering information), and our plans include a grid pattern for the village scene. Don't be put off by the scroll saw work and painting you see on the village scene. If it's a bit much, you could decorate the top with a simple chip carving, or paint on or cut out a heart, or just leave the top plain. You could even mount a battery operated clock behind a dial face, and use the calendar to keep track of not only the days, weeks and months, but also the hours and minutes.

Whatever your choice for decoration, the woodworking required for the calendar is fairly basic. The base of the project is just a back board (A). Rabbed cleats (B, C) hold the letters and numbers (F), which are mounted on sections of $\frac{1}{4}$ in. thick plywood (D, E). You'll note that our photo shows a few extra mounts filling out the spaces on the first and last weeks of the month. The extra mounts aren't mandatory, but they make the calendar look a little more complete. A drawer box and drawer are added at the bottom to hold the extra numbers and mounts, and the other eleven months.

Start with the back. You'll probably need to edge-glue several boards to



Bill of Materials

(all dimensions actual)

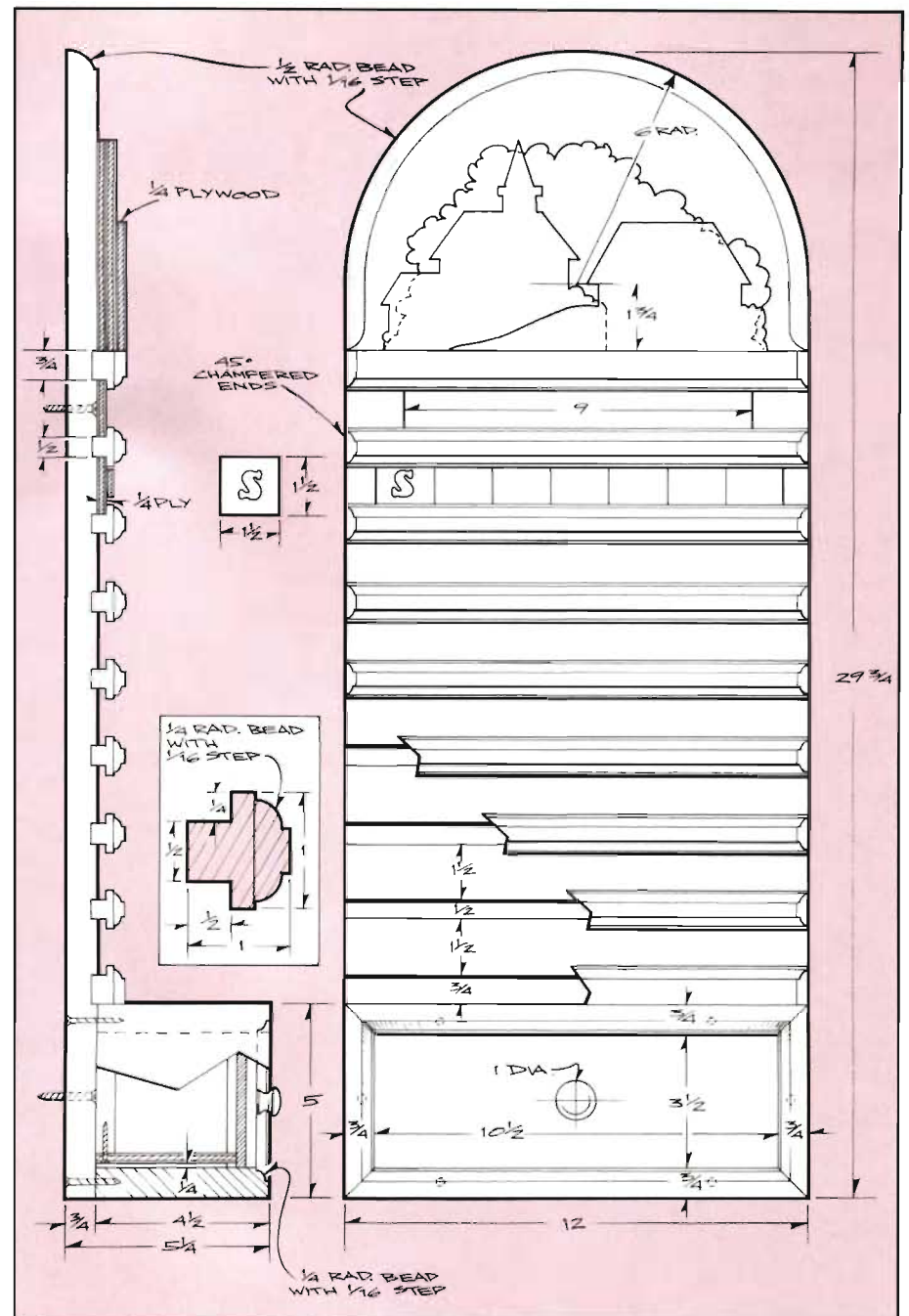
Part	Description	Size	No. Req'd.
A	Back	3/4 x 12 x 29 3/4	1
B	Cleat	1 x 1 x 12	7
C	Top/Bottom Cleat	1 x 1 x 12	2
D	Number/Day Mount	1/4 x 1 1/2 x 1 1/2	50
E	Month Mount	1/4 x 1 1/2 x 9	12
F	Letters/Numbers	Available as kit*	134
G	Box Top/Bottom	3/4 x 4 1/2 x 12	2
H	Box Side	3/4 x 4 1/2 x 5	2
I	Drawer Front	3/4 x 3 1/2 x 10 1/2	1
J	Drawer Back	1/2 x 3 x 10	1
K	Drawer Side	1/2 x 3 1/2 x 3 15/16	2
L	Drawer Bottom	1/4 x 3 11/16 x 10	1
M	Porcelain Knob	1 dia.	1
N	Trees	As Shown	1
O	Church	As Shown	1
P	House	As Shown	1
Q	Spacer Block	1/4 x 2 1/2 x 2 1/2	1

* Letter/number kit includes enough numbers for 31 days, plus the first letter of each of the seven days, and sufficient letters to spell out all 12 months. Kit is available from: Meisel Hardware Specialties, P.O. Box 70-J, Mound, MN 55364. Order kit no. 9300, Calendar Hardware Kit. Send \$14 per kit plus \$4.95 per order for shipping and handling.

get the needed 12 in. width. Once dry, cut the back to length and width, and lay out the 1/4 in. deep dadoes that position the cleats. Note that the top and bottom dadoes are 3/4 in. wide, while the remaining dadoes are 1/2 in. wide. These dadoes serve to locate the cleats during glue-up and aren't necessary for strength. If you include the dadoes, you'll need 1 in. thick stock for the cleats. To build the project using only 3/4 in. thick pine, just eliminate the dadoes.

Next, lay out the 6 in. radius on the top. Cut the radius with a jigsaw or band saw and smooth any roughness. Then use a 1/2 in. radius ball-bearing guided roundover bit, stepped down 1/16 in., to cut the roundover. Note that the bearing rides on the edge, so the bit will reproduce any irregularities. It's especially important that your shaping and sanding produce a perfectly smooth surface for the bearing to gauge against.

To make the cleats, first run off enough stock for all the cleats, then crosscut to separate stock for the top and bottom cleats. Make the rabbet and beading cuts, crosscut the cleats to length, chamfer the ends, and glue in place. Note that if you eliminate the dadoes and make the cleats from 3/4 in. thick stock, your rabbets will measure 1/4



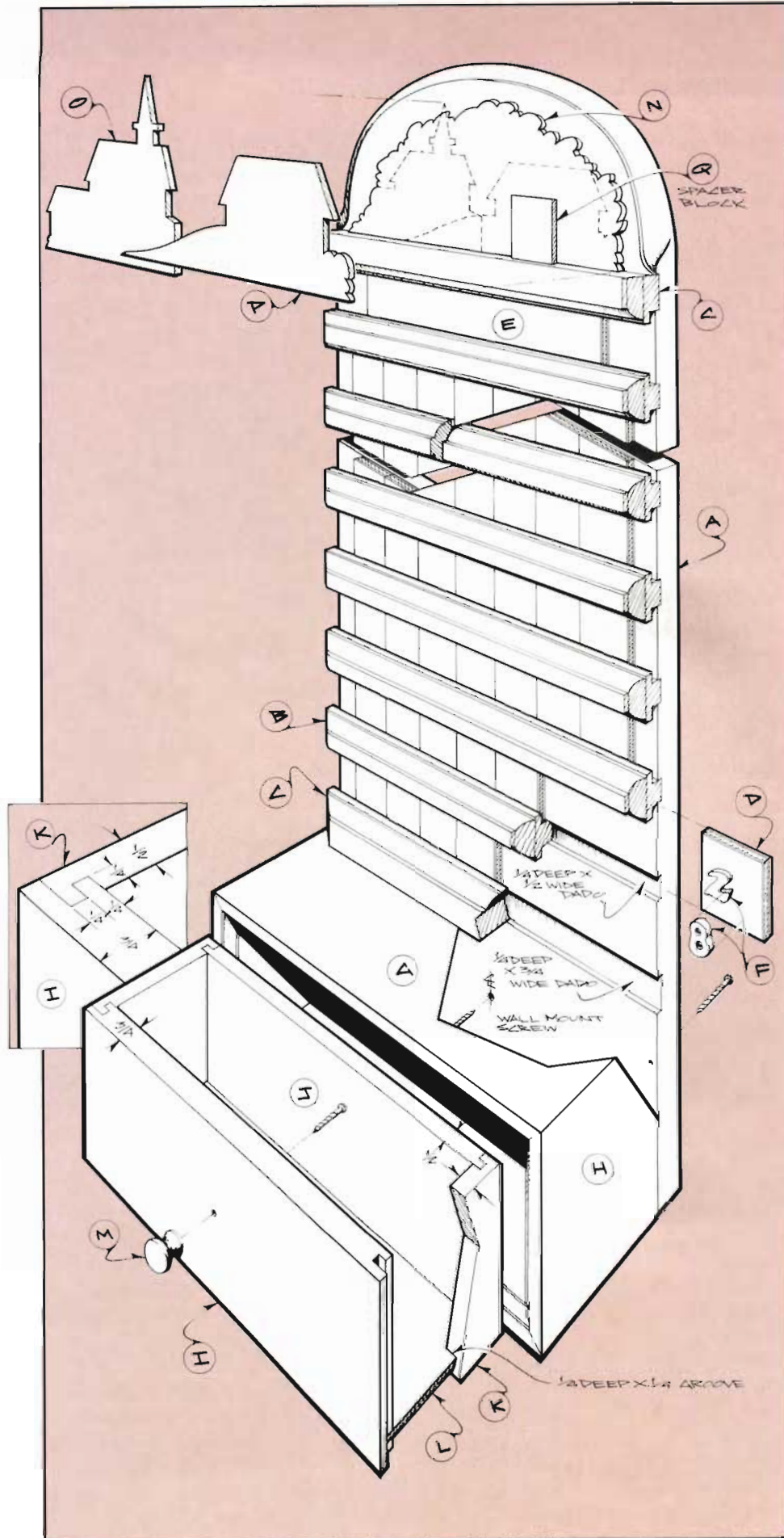
in. deep by 1/4 in. wide, instead of the 1/4 in. deep by 1/2 in. width shown. If you use the 3/4 in. thick stock, reinforce the cleats with countersunk screws inserted through the back.

Now make the drawer box. Start with a 3 ft. length of pine, 3/4 in. thick by 4 1/2 in. wide. Using either the router or the router table with a 1/4 in. radius beading bit (the same bit that you used to establish the bead on the cleats), cut a bead on one edge. Then make the miter cuts that establish the length of the top and bottom (G) and sides (H). Size the surfaces of the miter joints before gluing and clamping. Sizing the joint just means that an extra layer of glue is

applied to seal the end-grain before the final glue up. This extra layer of glue soaks into the 50 percent end grain of the miter, insuring against the condition that's known as a "starved" joint. It's an important step where the joint relies entirely upon glue strength, such as with our drawer box.

Once the drawer box is out of clamps, it can be screwed in place through the back. Be sure to countersink the screws so they don't protrude. You can also use glue, but with the six screws we show, glue is hardly necessary.

Now make the drawer. We used a rabbet and dado construction joining the front (I), back (J) and sides (K), but any



simple drawer construction will be fine. A few minutes with a sharp hand plane will quickly reduce $\frac{3}{4}$ in. thick pine to the $\frac{1}{2}$ in. thickness needed for the drawer back and sides. The plywood bottom (L) slides into place from the back, fitting neatly into a $\frac{1}{4}$ in. deep by $\frac{1}{4}$ in. wide groove cut into the front and sides. A brad or small screw inserted through the bottom and into the lower edge of the drawer back will fix the bottom in place. The 1 in. diameter porcelain knob (M) is a standard item at most hardware stores.

The numbers and letters are spray painted with a white enamel. One easy way to spray paint them is to stick them on long pins inserted through a sheet of cardboard. In addition to anchoring the pins, the cardboard serves as a surface to catch overspray. To allow for a good glue surface, the backs of the letters and numbers are not painted.

Once the paint has dried, the letters and numbers can be glued to their respective mounts. Note that although we show the mounts as $1\frac{1}{2}$ in. wide, in practice you'll need to sand a little off the edges so the mounts slide easily into place. Since the $\frac{1}{4}$ in. thick plywood that we use for the mounts actually measures a little under $\frac{1}{4}$ in. thick, the mounts should have no problem slipping into the rabbet formed on the cleats.

To make our village scene, first lay out the patterns on $\frac{1}{4}$ in. thick plywood and cut the shapes with a scroll saw. Next, using artist's acrylics (available at hobby and art supply stores), prime the surfaces to be painted, then paint the sky on the back and the village scene on the various sections, before gluing the sections in place. You can use our color photo as a guide for your coloring scheme, or better yet, create your own original color scheme. Just be careful not to apply paint to the areas of the back and scene sections that overlap and will be glued. The tree section (N) is glued directly to the back, the church section (O) is added next, and the house section (P) last. A spacer block (Q) glued between the tree section and house section adds stability and brings the house section out to the proper plane. The remaining wood surfaces are all stained to taste. Our choice of stain was Minwax Puritan Pine. A light coat of spray shellac over everything adds a final protective layer.



HANGING BIRD FEEDERS

Not all birds eat fruit, but orioles, cardinals, tanagers and woodpeckers are among those that love it, especially apples and oranges. These colorful feeders are easy to make and are a great way to attract the fruit-eating feathered friends around your neighborhood. However, these birds won't eat an orange unless it's peeled, so make sure you do that first. And some avid backyard birdwatchers tell us it helps to peel the apple, too.

The feeder will also hold suet, a favorite food for many birds. In fact, more than 80 bird species eat suet, so expect lots of activity at the feeder if you put it on the menu.

The fruit or suet is held in place with an aluminum gutter spike. These spikes, which are used to install certain kinds of aluminum gutters, are sold at most hardware stores. We purchased a 7 in. long spike, then cut it to a 5 1/4 in. length and filed the end to a point.

For each feeder, you'll need a piece of 3/4 in. thick pine measuring at least 9 1/4 in. square. A length of 1 by 10 pine is perfect, since it measures 3/4 in. thick by 9 1/4 in. wide. Transfer the full-size pattern to the stock, then cut it out with a scroll saw or jigsaw. You'll want to avoid short grain, which minimizes strength, so be sure to orientate the grain direction as shown. To make the 4 in. diameter inside cutout, you'll first need to bore a hole to accept the saw blade. Once cut out, smooth all the edges with

a file followed by a good sanding.

Use a ruler to scribe the center line of the 1/4 in. diameter spike holes. Once scribed, bore the two holes as shown. The lower hole is plugged from the outside, so you'll need to glue a 1/4 in. length of 1/4 in. diameter dowel in place as shown. It's best to cut the plug a little long so that it protrudes a bit after gluing. When dry, you can trim it flush before sanding smooth.

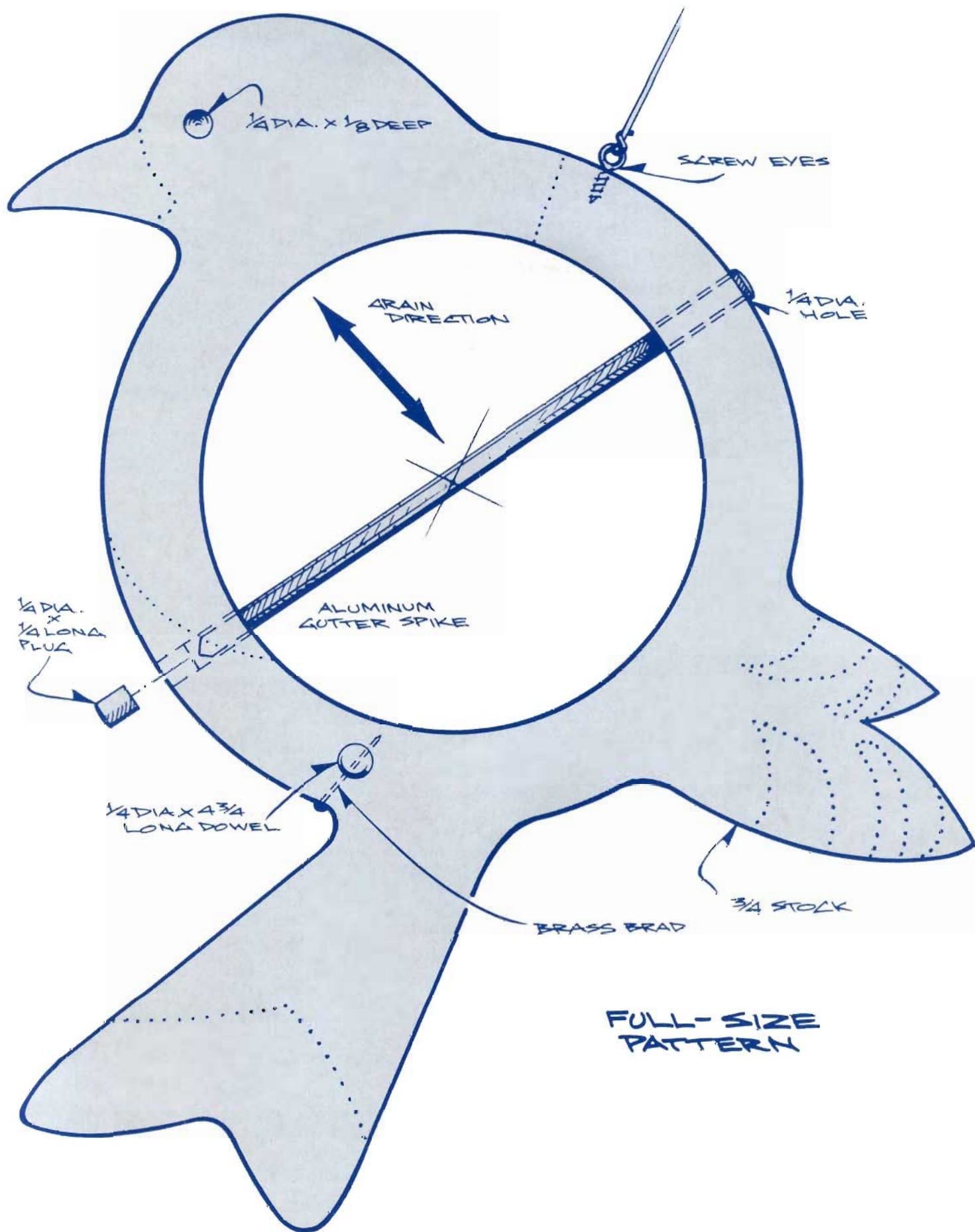
Refer to the full-size pattern for the location of the 1/4 in. diameter hole for the perch. Bore the hole completely through the 3/4 in. thick stock, then cut 1/4 in. diameter dowel stock to 4 3/4 in. long. Insert the dowel so that 2 in.

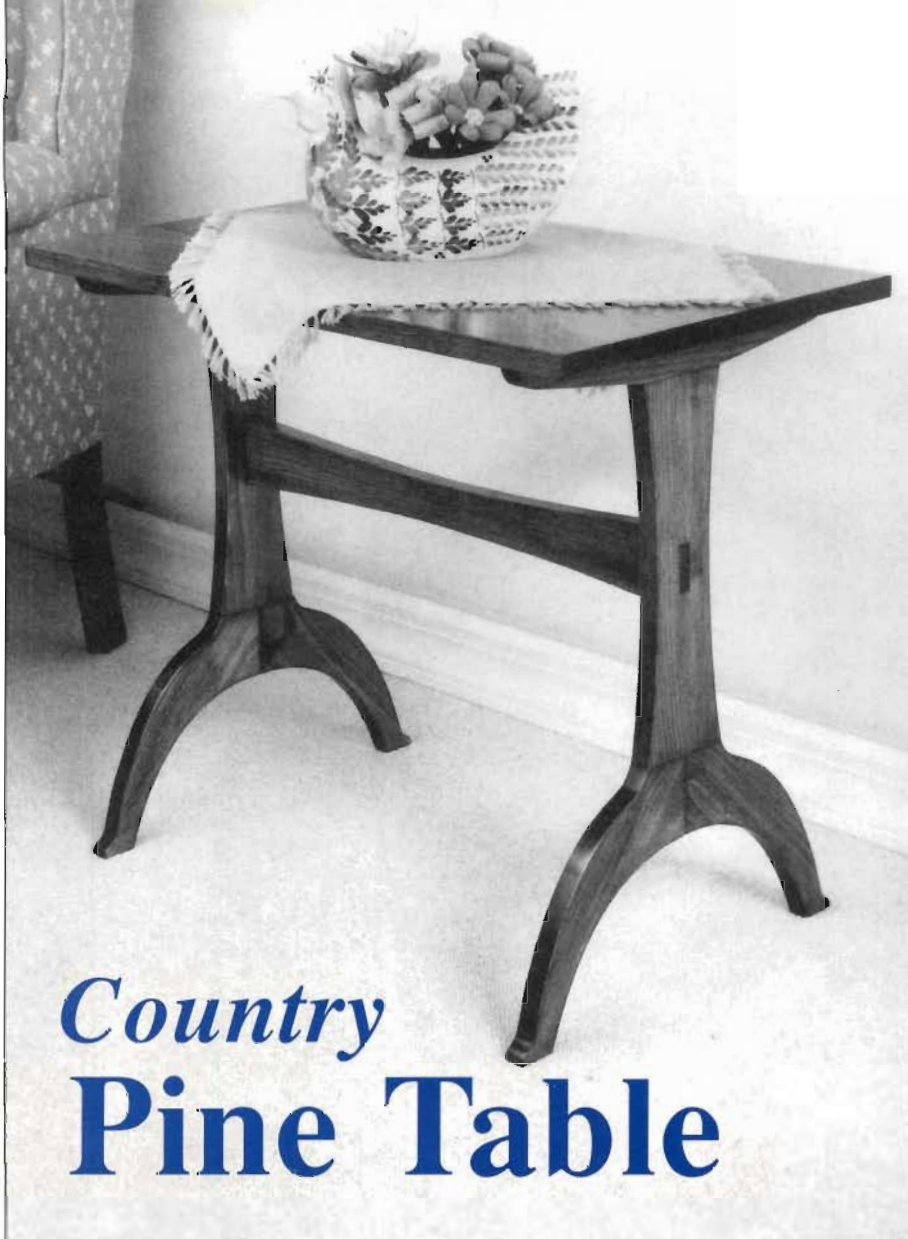
protrude on each side of the feeder, then drive a small brass brad to secure it in place.

A couple of coats of enamel paint will complete the project. We used red, yellow and black to paint the two feeders shown, but feel free to choose any colors you like. Note that the full-size pattern includes dotted lines that locate the color patterns for both feeders.

Add the screw eye and it's ready for the backyard. Ours is hung from a stainless steel wire, but fishing line will also stand up pretty well to the weather. Now you need only add an apple, orange or some suet and give the dinner bell a ring.







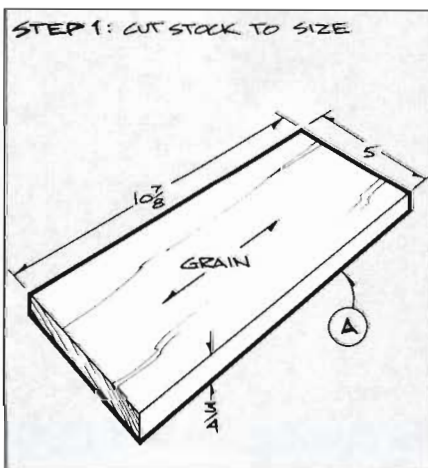
Country Pine Table

A small occasional table like this can be used in many ways around the house. It's perfect as an end or lamp table, or alongside your favorite chair. Since it doesn't weigh much (about 7 pounds), it makes a great portable table for the dining room or even in the den to hold extra TV snacks. The wedged through-tenon, a joint often used by early country cabinetmakers, secures the stretcher to the legs while adding both a nice detail and extra strength. We used pine for all parts (to help keep weight to a minimum), but feel free to choose any wood that suits your fancy.

The Feet and Legs

The feet (A) and legs (B) can be made first. These parts support the table so be sure to select stock that doesn't have

large knots or other defects. Since it's best to cut the leg and feet parts to final shape after they are assembled, we've worked out a six-step procedure to guide you along.

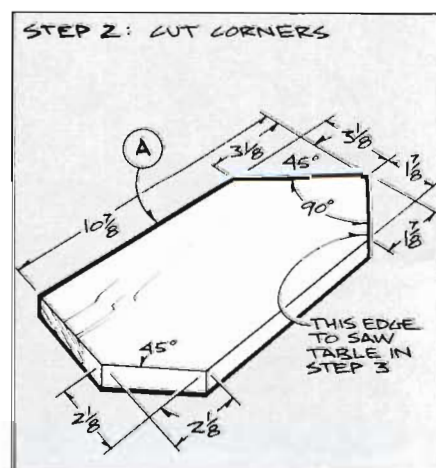


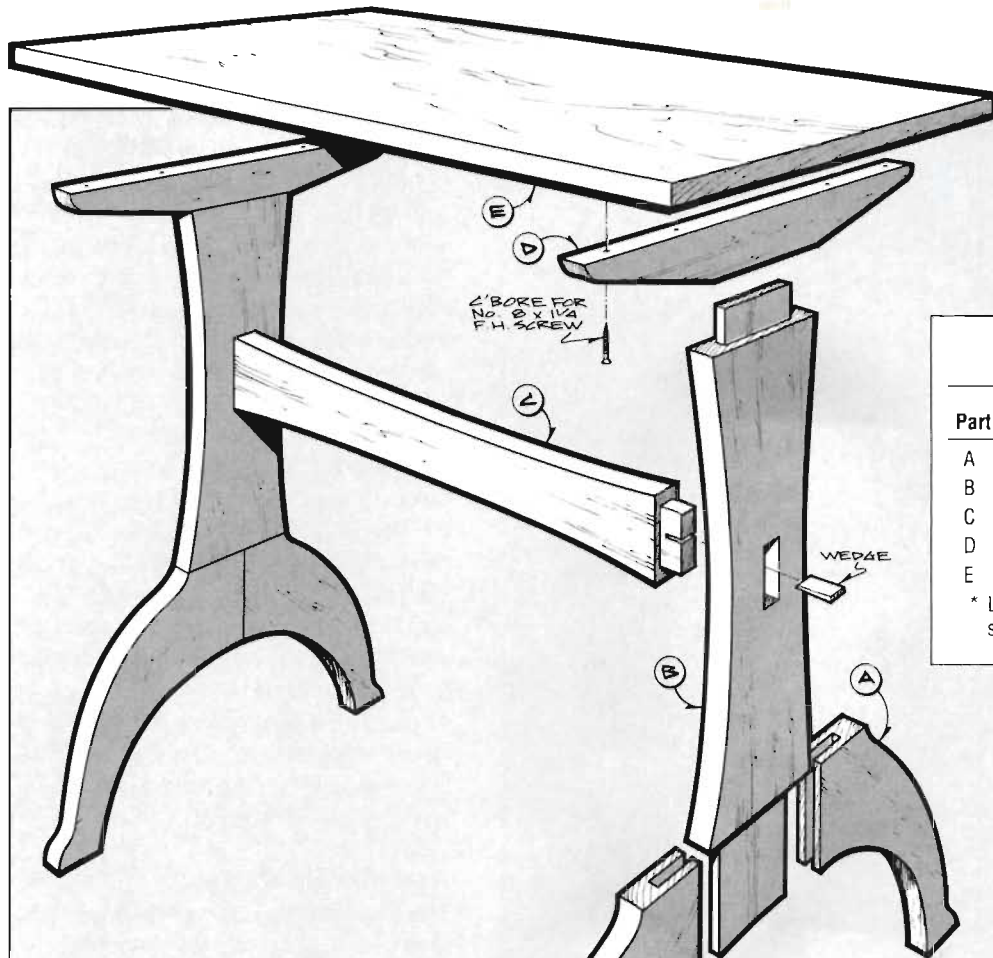
Step 1: Cut four pieces of $\frac{3}{4}$ in. thick stock to 5 in. wide by $10\frac{7}{8}$ in. long.

Step 2: Set the table saw miter gauge to 45 degrees and cut each leg part to the dimensions shown. Accuracy is important here so, before starting, check the 45-degree angle by making a couple of test cuts on scrap stock. Note that the edge that will go against the saw table in Step 3 is the one formed by the $1\frac{7}{8}$ in. by $1\frac{7}{8}$ in. dimensions.

Step 3: You'll need to make a simple jig in order to safely and accurately cut the $\frac{1}{4}$ in. wide by $1\frac{1}{8}$ in. deep groove in each foot. Make the jig back by cutting $\frac{1}{2}$ or $\frac{3}{4}$ in. thick plywood (or particle-board) to about 6 in. wide by 14 in. long. Cut the support to size and screw it to the back as shown. The screws must be well above the area that will be cut by the dado head later on. Once the support is assembled, check to make sure that it is exactly 45 degrees to the saw table.

Now, set the dado head to make a $\frac{1}{4}$ in. wide by $1\frac{1}{8}$ in. deep cut. Clamp the foot stock to the jig back (see Step 2 to make sure the correct edge goes against the table), then locate the table saw rip fence so that the dado will cut a groove exactly in the center of the $\frac{3}{4}$ in. thick stock. Start the saw and, while holding the jig firmly against the rip fence, run the foot stock through the dado. Be sure to keep your hands well away from the dado cutters while using the jig.



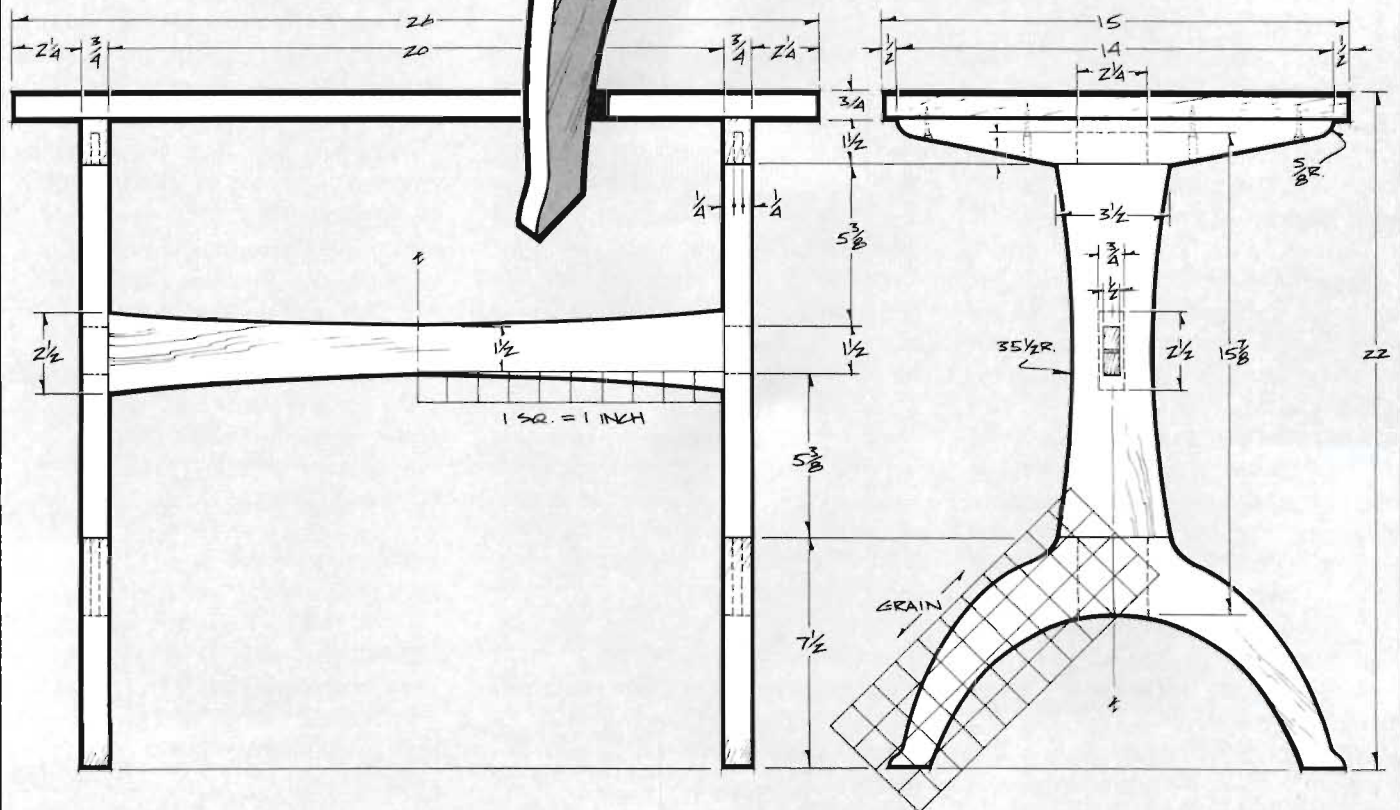


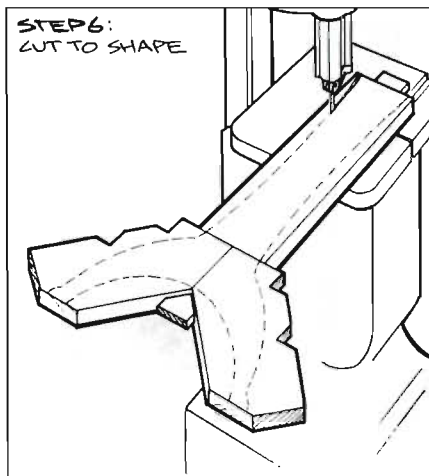
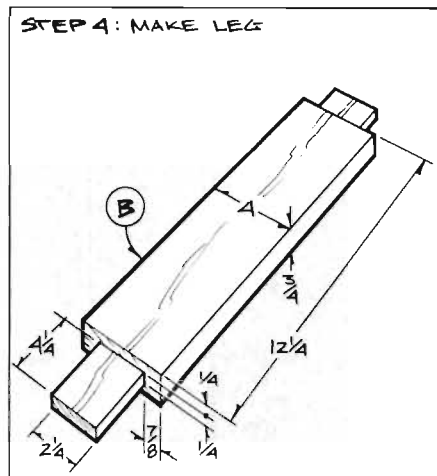
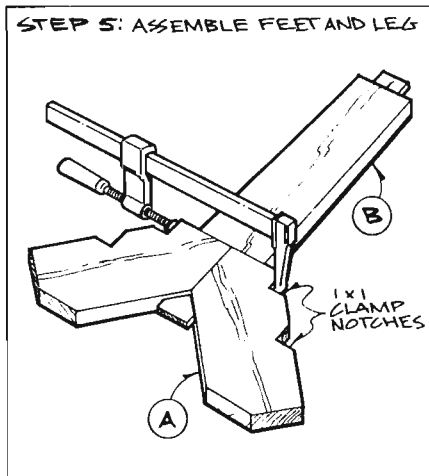
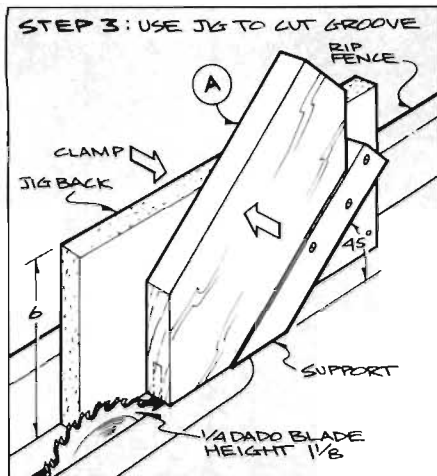
Bill of Materials

(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Foot	$\frac{3}{4} \times 5 \times 10\frac{7}{8}^*$	4
B	Leg	$\frac{3}{4} \times 4 \times 17\frac{1}{2}^*$	2
C	Stretcher	$\frac{3}{4} \times 2\frac{1}{2} \times 21\frac{1}{2}$	1
D	Cleat	$\frac{3}{4} \times 1\frac{1}{2} \times 14$	2
E	Top	$\frac{3}{4} \times 15 \times 26$	1

* Length and width dimensions allow extra stock for later trimming.





Step 4: Rip stock for the leg to 4 in. wide by 17½ in. long. Use the dado to cut the tenons on each end as shown. Note that the bottom tenon is cut extra long (4¼ in.) to allow for trimming later when the feet are added.

Step 5: Use the band or saber saw to cut a pair of clamp notches on each foot as shown. Add glue to the bottom leg tenon and the foot grooves, then assemble and clamp with a pair of bar clamps. Allow to dry overnight.

Step 6: Referring to the end view (pg. 63), transfer the grid pattern for the foot from the drawing to a paper template. Using the template, trace the profile on the foot stock as shown. Also, scribe the 35½ in. radius on both sides of the leg.

A wooden yardstick can be easily converted into a giant compass for scribing the radius. On one end bore a 1/8 in. diameter hole to accept the point of a pencil. Then measure 35½ in. from this point and drive a brad through the yardstick to serve as a pivot point.

Once the profiles have been traced, use a band or saber saw to cut them out. Make the cuts slightly on the outside of the marked line, then sand exactly to the line.

The Stretcher

The stretcher (C) is made next. Cut it to length and width from ¾ in. thick stock and use the dado head to cut the ¾ in. long through-tenons on each end. Now, transfer the grid pattern to the stretcher and cut it out with the band or saber saw.

Next, using the stretcher tenon as a template, lay out and mark the location of the mating mortise on the leg. Once marked, a sharp chisel will chop out the mortise in short order.

The Cleats

Make the cleats (D) as shown in the front and end views. Lay out and mark the mortise location using the leg tenon as a template. Once marked, cut the mortise with a sharp chisel. Use a hand plane to

cut the tapers. The 5/8 in. radius on the end of the tapers can be made with a file or rasp.

Note that each stretcher is counter-bored to accept four 1¼ in. long by no. 8 wood screws. Make the screw shank holes slightly oversized. Later, when the top is added, the oversized holes will allow the top to expand and contract with changes in humidity.

The Top

Since 15 in. wide stock is hard to come by, you'll probably need to edge-glue two or three narrower boards in order to get enough width for the top (E). It's best to cut the boards so that the glued-up stock will be slightly wider and longer than necessary. Apply a thin coat of glue to the mating edges, then clamp firmly with bar or pipe clamps. Once dry, remove the clamps and trim to 15 in. wide by 26 in. long.

Assemble the Parts

Dry assemble the cleats to the legs and check to make sure the mortises and tenons fit properly. If all looks okay, add glue to the mating surfaces and clamp firmly. Once clamped, check for squareness and set aside to dry.

The stretchers can now be assembled to the legs. The wedged tenon adds an interesting detail as well as some extra strength. A ½ in. deep saw kerf in the tenon serves as a slot for the wedge. Cut the wedges long so they protrude a little. Apply a thin coat of glue to the leg mortise and to the stretcher tenon, then assemble and clamp. Add a little glue to the wedge and drive it in place, but do so with care. If you drive the wedge in too far, it could split the tenon. Next, check for squareness and if all looks okay, set aside to dry. Once dry, remove the clamps, trim the wedge flush with the leg and sand smooth. The top can now be screwed in place.

Apply the Finish

Final sand all parts, taking care to round over all sharp edges and corners. We finished our table with two coats of Minwax Puritan Pine stain followed by two coats of their Antique Oil. An application of paste wax completed the project.



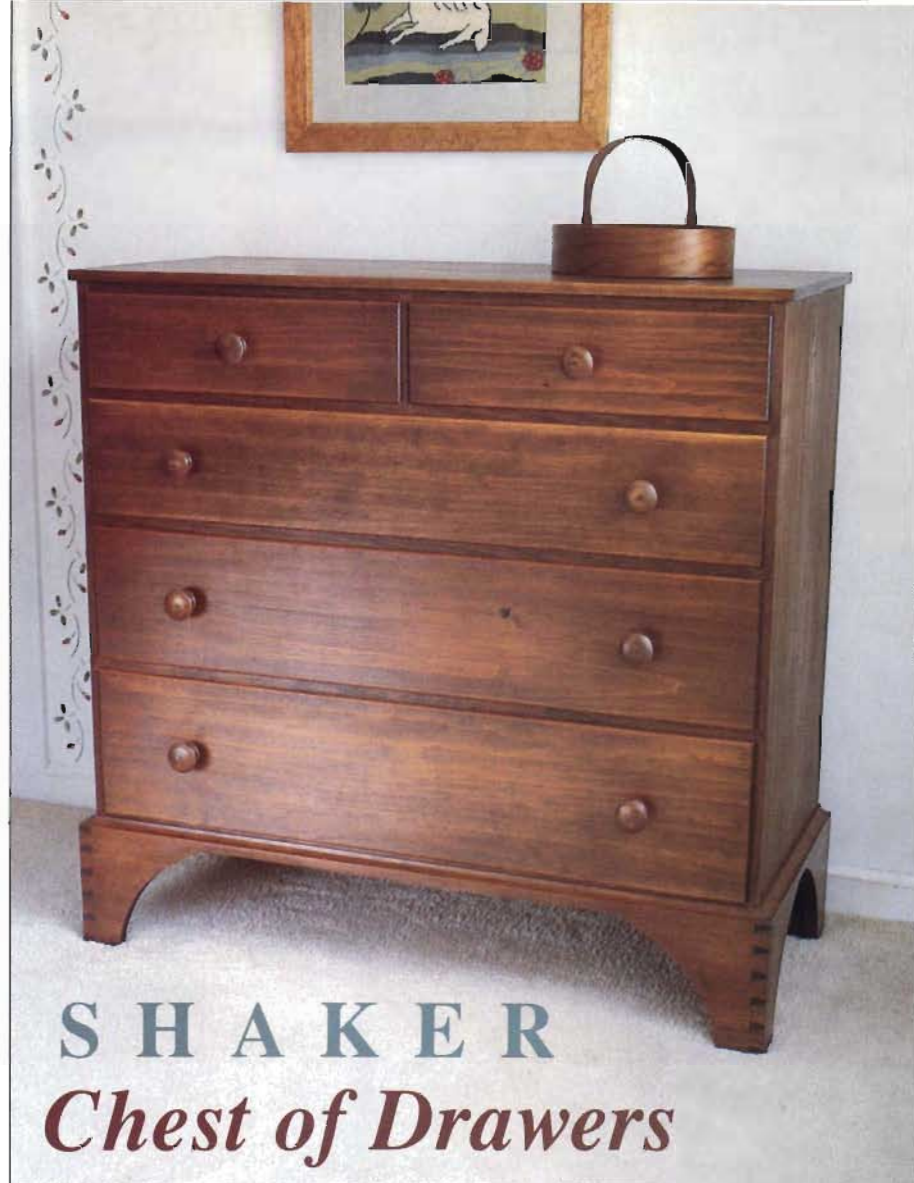
The Shaker Chest shown in our photo was built by Massachusetts cabinetmaker Gene Cosloy, and is a reproduction of a piece in the Fruitlands Museum in Harvard, Massachusetts. It's built of eastern white pine and features dovetailed construction throughout, even down to the corners of the arched bracket base.

Like the original, this chest sports solid stock back boards and drawer bottoms. Though it's tempting to substitute plywood for these parts, by making the piece entirely from solid stock you'll maintain the integrity of the original design. But don't be afraid to select a wood other than pine. The Shakers often preferred cherry for a classic chest like this. Walnut, butternut or curly maple are other excellent, though less traditional, choices.

Start by edge-gluing stock for the sides (A), top (B) and bottom (C). Although the Shakers usually saved their wide stock for these parts, unless you are willing to pay a premium or have access to some wide boards, you'll have to join several narrow boards to get the needed width.

While waiting for your edge-glued stock to dry, go to work on the remaining case parts. The interior case construction is as follows. A pair of top rails (D) with dovetailed ends tie the two sides together, and a pair of cleats (E) mount the top. The drawers are supported by a series of drawer frames. The uppermost frame consists of two rails (F) joined by two ends (G) and a center stretcher (H). A dovetailed divider (I) locks the top front rail to the front rail of the uppermost drawer frame. The drawer guide (J) then maintains the separation of the two top drawers. All that's left inside are the two remaining drawer frames, each consisting of a single drawer frame rail (F) and a pair of runners (K).

Since the rails, cleats, ends, divider, guides and runners are all $\frac{3}{4}$ in. thick by $1\frac{1}{2}$ in. wide, just run off sufficient stock for all these parts. If you have a thickness planer, it will make cutting and assembling the case much simpler if all the $\frac{3}{4}$ in. thick parts are run through the planer at the same $\frac{3}{4}$ in. setting. This will help eliminate a good deal of the usual fussing with setups when cutting



SHAKER *Chest of Drawers*

the various mortise and tenon joints on the drawer frames, and the running half dovetail joints that then join the drawer frames to the chest sides. Refer to Figs. 1 and 2 for the drawer frame joinery, glue and assemble the frames, and set aside to dry. But don't cut the half dovetail on the drawer frames yet. These aren't cut until after the matching running dovetails in the sides are established. As you'll note from the Bill of Materials and the illustrations, the drawer frames are sized to allow $\frac{1}{4}$ in. space between them and the back, and the cleats are sized to stop $\frac{1}{8}$ in. shy of the two top rails. The space is needed to allow for the inevitable wood movement as the sides come and go with changes in humidity.

With the sides out of clamps, lay out for the running half dovetails that mount the drawer frames and bottom. Cut these by first making a $\frac{1}{8}$ in. deep cut with a $\frac{3}{4}$ in. wide straight cutter. Here's where

that earlier caution to send all your stock through the planer at the same $\frac{3}{4}$ in. thickness pays dividends. If all your stock has been thickened to exactly $\frac{3}{4}$ in., then after the initial $\frac{1}{8}$ in. deep by $\frac{3}{4}$ in. wide cut with the straight cutter, all that remains is to make a series of cuts with a $\frac{1}{2}$ in. diameter straight cutter, followed by the dovetail bit. The straight cutter hogs out most of the waste, though, depending on your router's power, several passes may be needed to achieve the full $\frac{9}{16}$ in. depth. If your stock hasn't been thickened to exactly $\frac{3}{4}$ in., you'll need to custom-fit the half-dovetail cuts to the frame stock thickness—a fussy procedure requiring several extra setups.

By hogging out most of the stock with the straight cutters, the dovetail bit can be used in a single pass. But don't make the mistake of just switching bits and going to work. Check your depth setting first on some scrap (it's important that

the depths of cut be identical or you'll notice a small step), and double check the setting of the guide board you are bearing the router against. An easy way to make certain that each pair of half-dovetails is indexed identically is to make each cut at the same time. To do this just clamp both of the case sides edge-to-edge with the top and bottom ends flush. Use a wide guide board for the router to bear against or you'll risk some deflection and inaccuracy.

With the half-dovetails in the sides cut, next use the table saw and dado head to establish the $\frac{9}{16}$ in. deep by $\frac{3}{4}$ in. wide rabbet that runs the full length of each back edge. Also make the U-shaped cutout at the bottom end of each side.

You are now ready for the interior dovetail joinery that ties the two sides together. First cut the full dovetails on the ends of the top rails (see Fig. 1). Use those dovetails to mark for the corresponding dovetail mortises on the top ends of the sides, and cut them out. Use a dovetail saw to establish the sides of the mortise, the same as when cutting

Bill of Materials

(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Side	$\frac{3}{4}$ x $17\frac{3}{4}$ x $40\frac{1}{4}$	2
B	Top	$\frac{3}{4}$ x 18 x $39\frac{3}{4}$	1
C	Bottom	$\frac{3}{4}$ x 17 x $38\frac{7}{8}$	1
D	Top Rail	$\frac{3}{4}$ x $1\frac{1}{2}$ x $38\frac{1}{2}$	2
E	Cleat	$\frac{3}{4}$ x $1\frac{1}{2}$ x $13\frac{3}{4}$	2
F	Drawer Frame Rail	$\frac{3}{4}$ x $1\frac{1}{2}$ x $38\frac{7}{8}$	4
G	Drawer Frame End	$\frac{3}{4}$ x $1\frac{1}{2}$ x $14\frac{1}{2}$ *	2
H	Drawer Frame Stretcher	$\frac{3}{4}$ x $2\frac{1}{4}$ x $14\frac{1}{2}$ *	1
I	Divider	$\frac{3}{4}$ x $1\frac{1}{2}$ x $6\frac{5}{8}$	1
J	Drawer Guide	$\frac{3}{4}$ x $1\frac{1}{2}$ x $15\frac{1}{4}$	1
K	Drawer Runner	$\frac{3}{4}$ x $1\frac{1}{2}$ x $15\frac{5}{8}$ *	4
L	Base Front	$\frac{3}{4}$ x $8\frac{1}{2}$ x $40\frac{3}{4}$	1
M	Base Side	$\frac{3}{4}$ x $8\frac{1}{2}$ x $18\frac{3}{4}$	2
N	Back (Upper)	$\frac{3}{4}$ x $7\frac{5}{8}$ x $38\frac{7}{8}$	1
O	Back (Lower)	$\frac{3}{4}$ x $11\frac{1}{4}$ x $38\frac{7}{8}$	3
P	Knob	$1\frac{3}{4}$ Dia.**	8

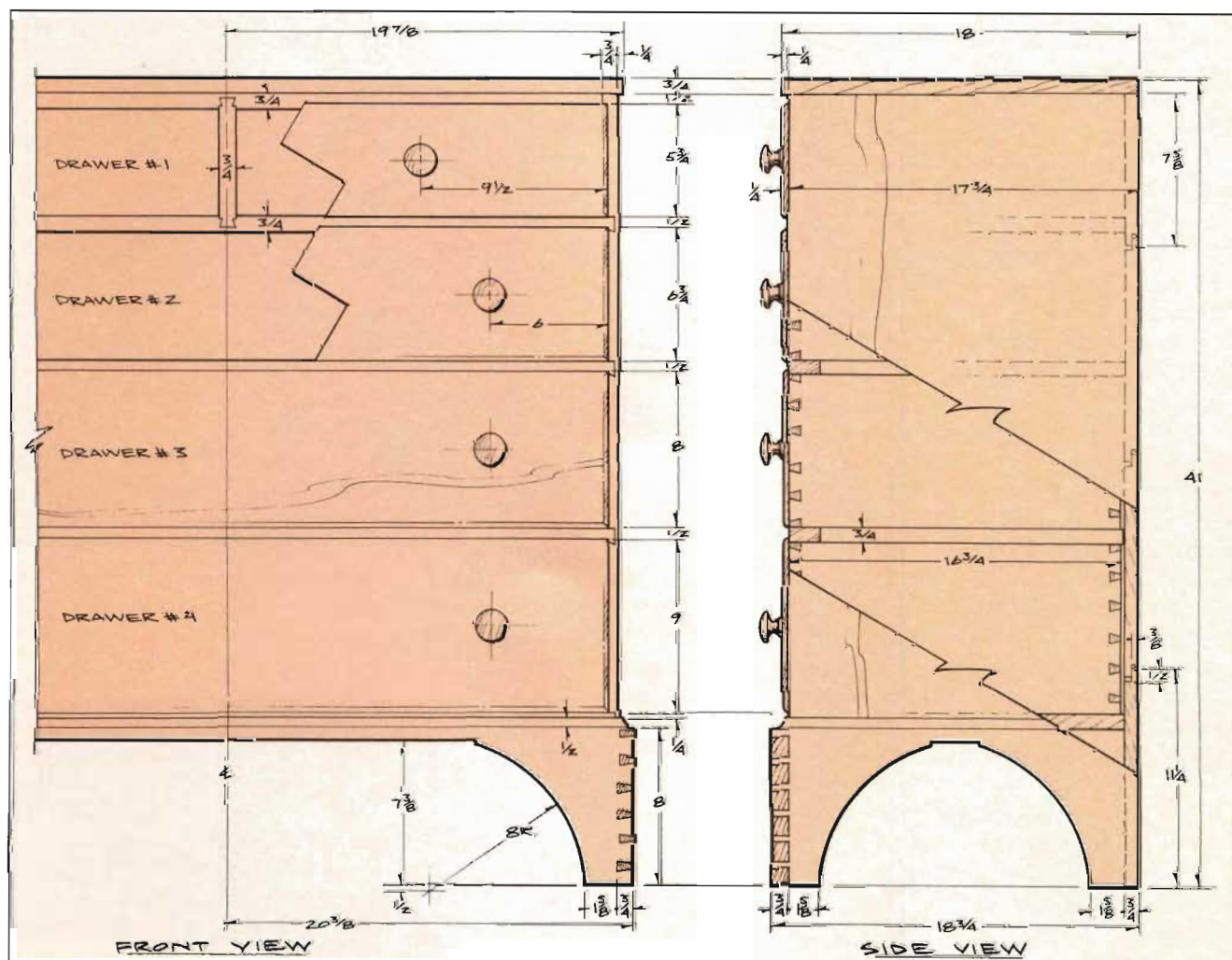
* Length includes tenon(s).

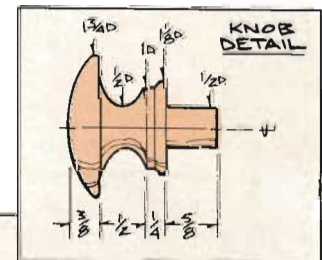
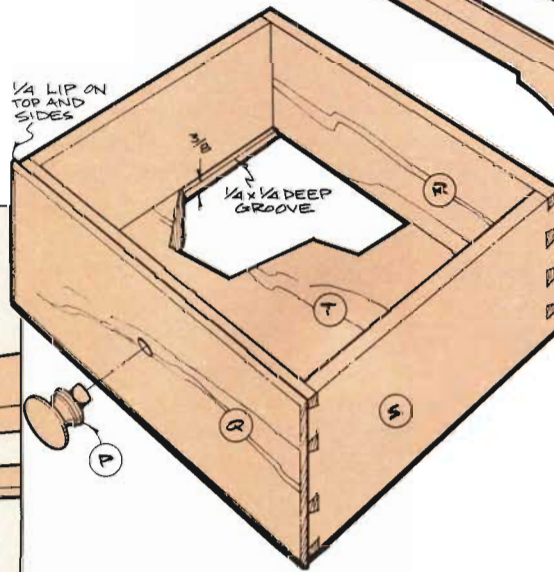
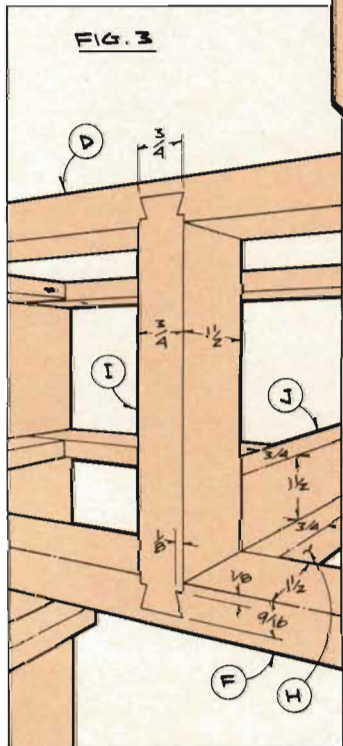
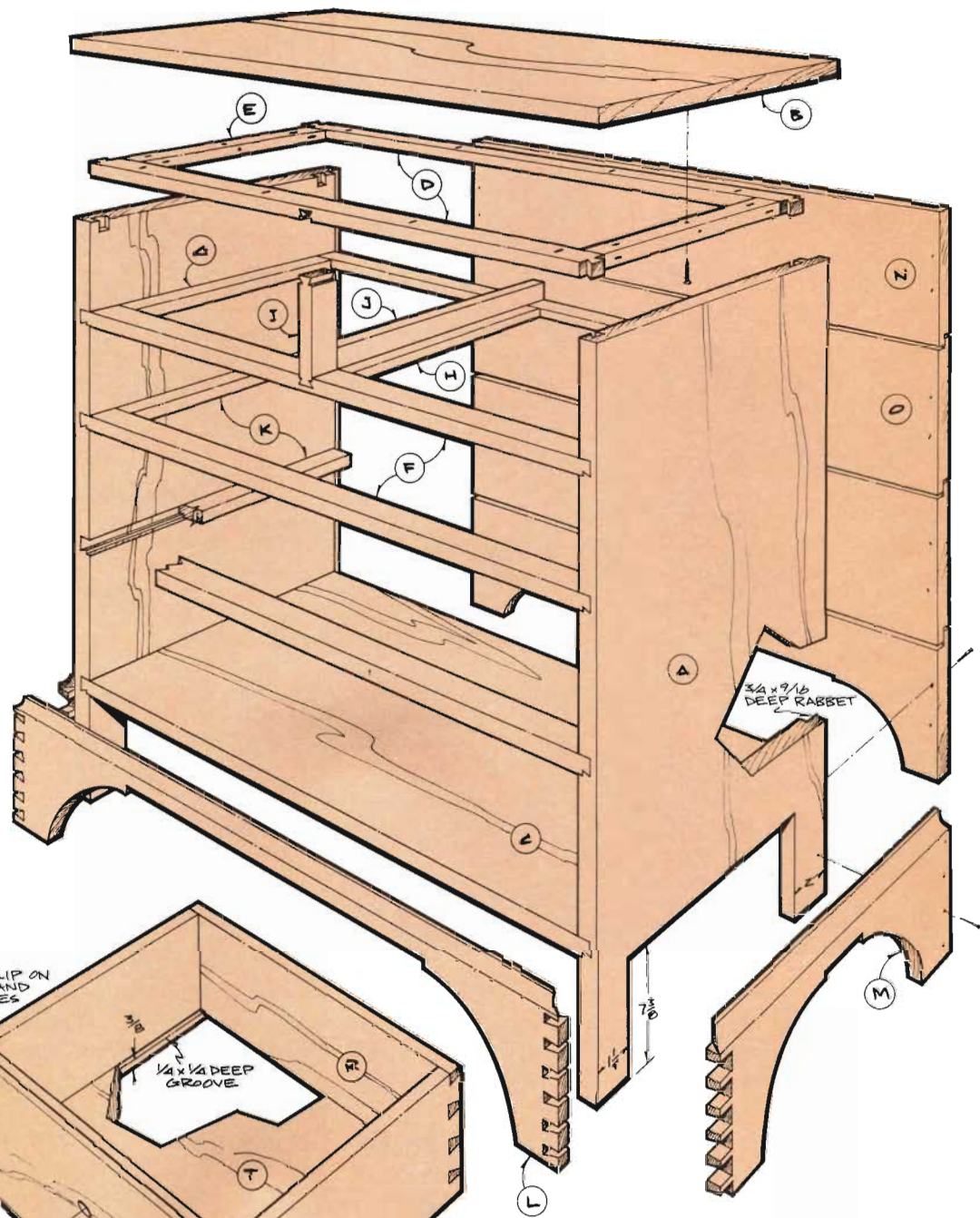
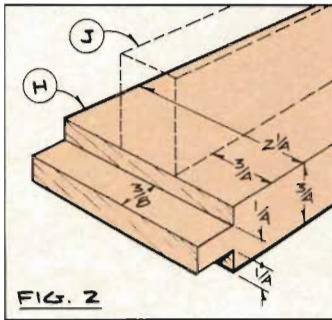
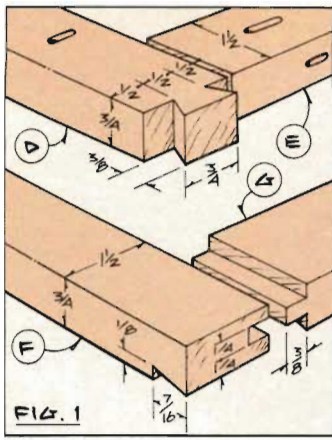
** Available from Woodcraft, 210 Wood County Industrial Park, P.O. Box 1686, Parkersburg, WV 26102; tel. 800-225-1153. Order part no. 50L61 for 10 maple knobs (\$5.90), or part no. 50R51 for 10 cherry knobs (\$7.25).

half-blind dovetails, then chop out the waste and continue the dovetail saw cut with chisel work. Just remember to stay on the inside of your layout lines so as to not end up with a sloppy-fitting dovetail.

Next, set up your router table with the same dovetail bit that you used for the half dovetails in the sides, and cut the corresponding half dovetails on the drawer frames and bottom. Since you'll be working with the frames and bottom on end, use a high supporting fence for these parts to gauge against. Use a test piece to establish the proper fence setting before going to work on the actual parts. The half dovetails should not be too tight. Ideally, you'll be able to slide the frames and bottom into position without using anything more than a few light taps on a scrap block.

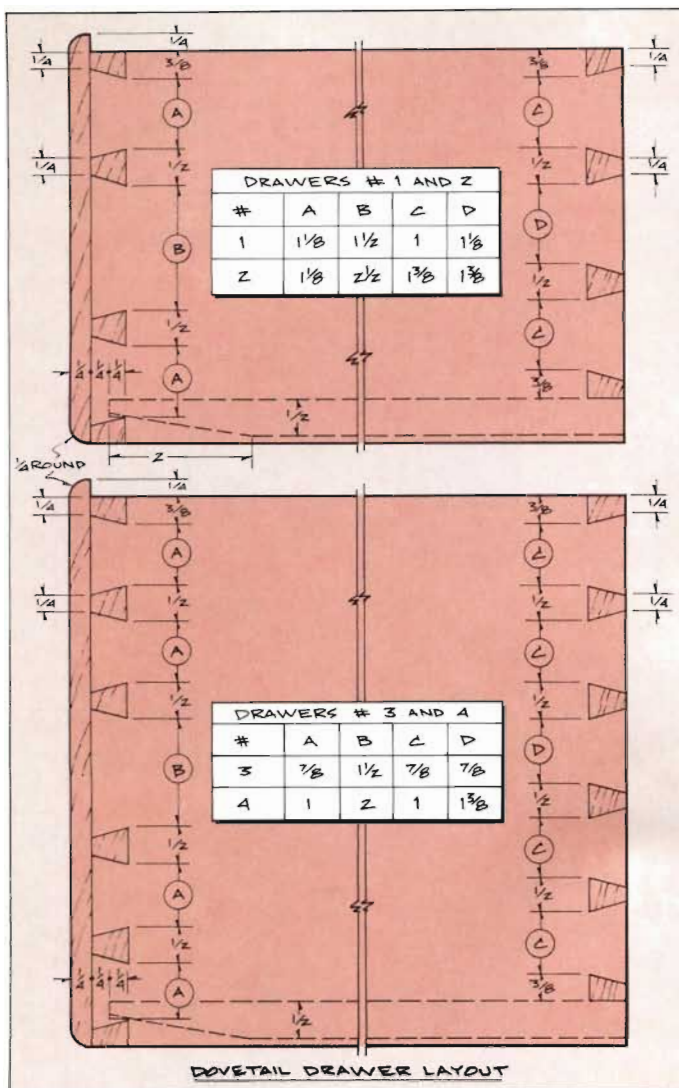
You are now almost ready to assemble the case. But first, don't forget to cut the dovetails on the divider ends, and the matching dovetails in the top front rail and in the front rail of the uppermost drawer frame. You can use the router with straight cutters and the dovetail bit





Drawers

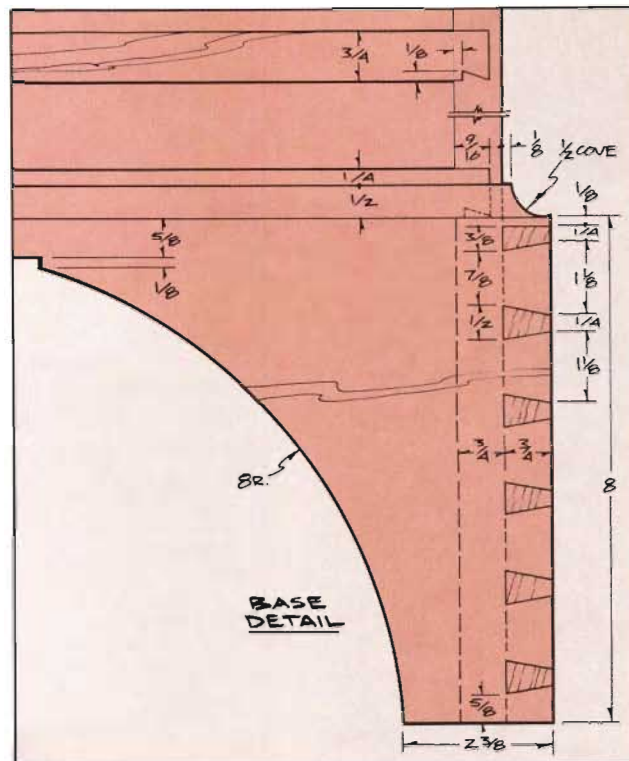
Part	Description	No. Req'd Per Drawer	Drawers No. 1	Drawer No. 2	Drawer No. 3	Drawer No. 4
Q	Front	1	3/4 x 5 3/4 x 19	3/4 x 6 3/4 x 38 1/4	3/4 x 8 x 38 1/4	3/4 x 9 x 38 1/4
R	Back	1	1/2 x 4 7/8 x 18 1/2	1/2 x 5 7/8 x 37 3/4	1/2 x 7 1/8 x 37 3/4	1/2 x 8 1/8 x 37 3/4
S	Side	2	1/2 x 5 1/2 x 16 3/4	1/2 x 6 1/2 x 16 3/4	1/2 x 7 3/4 x 16 3/4	1/2 x 8 3/4 x 16 3/4
T	Bottom	1	1/2 x 16 1/2 x 18	1/2 x 16 1/2 x 37 1/4	1/2 x 16 1/2 x 37 1/4	1/2 x 16 1/2 x 37 1/4



for the rail dovetails, and the router table for the dovetails on the divider. Note that the dovetail mortise in the drawer frame rail will cut into the tenon on the stretcher. Use a chisel to finish the blind end of that dovetail mortise.

Drill the screw holes in the cleats, test-fit all the dovetailed case parts, and if everything fits, glue and assemble. Mount the bottom first and then the two top rails. For the bottom, apply glue to the front half of the bottom and the back half of the corresponding half dovetail in the sides, then slide the bottom into place from the front. This gluing technique enables you to slide the bottom in halfway before there's any resistance from the glue, and also helps avoid a situation where most of the glue is forced out. Apply glue only to the front half of the drawer frames, and be sure to also slide the frames into position from the front. That way you'll not get any glue into the rest of the running dovetails, which must be free to move as the sides respond to changes in humidity. Glue and assemble the divider, and add the drawer guide and cleats.

You shouldn't need much in the way of clamps for the assembly. What clamps you do use should be adjusted as needed to insure that the case is square. While waiting for the case to dry, go to work on the base (L, M). Start by ripping about 7 ft. of stock to 8 1/2 in. wide. Then, using either your table saw molding head or the router and a 1/2 in. radius cove cutter, establish the 1/2 in. cove on one edge. Next, cut the front and sides to about 1/16 in. longer than the final length, and lay out



and cut the dovetails (see Base Detail). The dovetails are cut just a little over 3/4 in. deep so that after assembly the extra can be sanded flush. This extra also allows some fine-tuning of the miters at the top edge of the corners. Once the dovetails and miters are cut and fitted, lay out the 8 in. radii that form the bracket feet. Cut the shape with a hand-held jigsaw, then use files and sandpaper to smooth the curves. If you have a laminate trimmer bit, an easy way to establish the long flat between the bracket feet on the base front is to clamp a straightedge as a guide and use the laminate trimmer for most of the distance. A little handwork will square the corners at the ends of the flat.

Mount the base with glue at the base front and at the dovetails, but don't glue the back section of the base sides. As shown in the exploded view, several cut nails anchor the base sides at the back edge. Next, rabbet the back boards (N, O), and mount them with cut nails (available at most lumberyards). The three lower back boards, at 11 1/4 in. wide, can be cut directly from standard 1 by 12 pine without any waste. For the upper back board you'll need to first rip a 1 by 10 down to 7 5/8 in. wide and then establish the 3/8 in. deep by 1/2 in. wide rabbet.

Our drawers show traditional half-blind dovetail construction at the front (Q), with dovetails also joining the back (R) and sides (S). The drawer fronts are all lipped at the top and sides, but flush on the bottom. The Dovetail Drawer Layout detail shows a suggested layout for the dovetails on the various drawers. The charts included provide dovetail spacing for all five drawers. The solid stock drawer bottoms (T) have a bevel on each end and on the front edge, but the back edge is left square. Cut nails lock the bottom into the lower edge of the drawer back. The grain of the drawer bottoms is oriented so any movement in the bottom will be directed toward the back.

You can turn the knobs (P) as shown in the Knob Detail, or the knobs are available from a mail order source (see Bill of Materials). Add your favorite stain, if desired, then follow that with several coats of penetrating oil.



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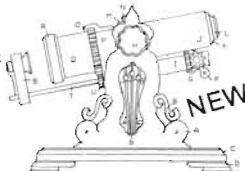
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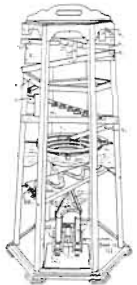
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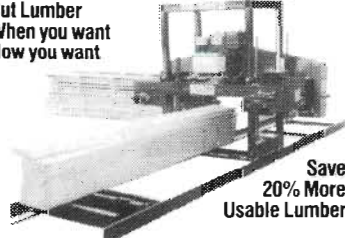


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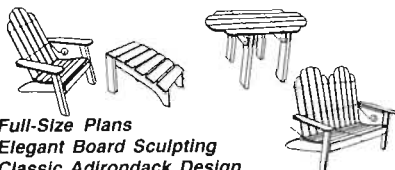
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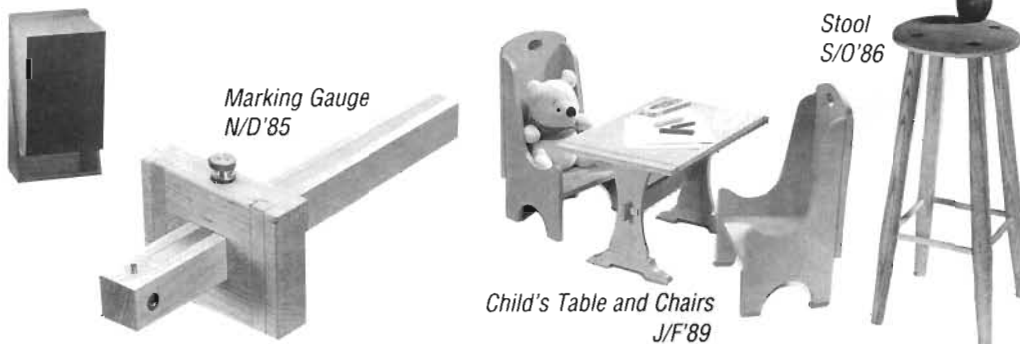
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Kitchen Canister Set, Riding Biplane, Contemporary Serving Cart, Napkin Holder, Decorative Planter, Country Vegetable Bin, Medicine Cabinet, Shop Drum Sander, Vienna Regulator Clock, Display Pedestal; *Articles:* Penetrating Oils; The Joiner; Veneer, Part I; Dovetail Key Butt-Miter.

Vol. 11 No. 4 July-Aug '87

Early American Bookcase, Trash Container, Low-Cost Workbench, Country Basket, Desk Calendar with Pen & Pencil, Butterfly Pull Toy, Vanity Mirror with Drawer, Apothecary Chest, TV/VCR Cabinet; *Articles:* Shellac; The Hand Plane; Veneer, Part II; Incised Carving.

Vol. 11 No. 5 Sept-Oct '87

Contemporary Love Seat, Two-Drawer Platform Bed, Snail Pull Toy, Routed Trivets, Spice Rack with Chip Carving, Joiner's Tool Chest, Shaker-Style Step Stool, Turned Shop Mallets, Woodbox; *Articles:* French Polishing Made Easy; Plane Iron Sharpening; Making a Splayed Leg Drill Guideblock; Traditional Chip Carving; Shop-Tested: 12 Jigsaws.

Vol. 11 No. 6 Nov-Dec '87

Rocking Horse, Three-Drawer Jewelry Chest, Tapering Jig, Rolling Toy, Folk Art Silhouette, Two Towel Racks, Early American Style Wall Shelf, Corner Cupboard, Stacking Wine Racks, Curio Cabinet; *Articles:* Glues and Gluing; Band Saw Setup; Making the Continuous Bracket Foot; Step-By-Step To a Flawless Finish.

Vol. 12 No. 1 Jan-Feb '88

Contemporary Coffee Table, Puss 'n Books Bookends, Cookbook Holder, Wooden Jewelry, Child's Duck Puzzle, Shaker Wall Clock, Stereo Cabinet and Speakers, Country Occasional Table, Drill Press Jig, Early American Pierced Tin Cabinet; *Articles:* Edge-Gluing; The Drill Press; Pierced Tin; Four Shopmade Finishes.

Vol. 12 No. 2 Mar-Apr '88

Oak & Glass Tier Table, Crystal Regulator Clock, Early American Candlesticks, Arrow Wall Decoration, Three-Drawer Country Wall Box, Key Cabinet, Contemporary Box, Shaker Carrier, Folk Harp; *Articles:* Use and Sharpening of the Hand Scraper; The Lathe: Basic Setup; Quartered Turnings; Lacquer.

Vol. 12 No. 3 May-June '88

Loon Carving, Early American Dry Sink, Contemporary Dresser, Old-Time Pipe Box, Antique Knife & Fork Tray, Dutch Tulip Folk-Art Silhouette, Colonial Salt Box, Bud Vase, Miter Gauge Stop, Hunt Table; *Articles:* Spindle Turning; Selecting and Sharpening Lathe Tools; Recessed Finger Pull Step-by-Step; Types of Stain.

Vol. 12 No. 4 July-Aug '88

Magazine Rack, Occasional Table, Mitered-Corner Box, Heart Stool, Decorative Cutting Boards, Piggy Bank, Turned Bowl, Country Cupboard, Four-Drawer Lamp; *Articles:* Faceplate Turning; Workshop Layout; Cutting Dovetails on the Table Saw; Staining Basics.

Vol. 12 No. 5 Sept-Oct '88

Miter Cutting Jig, Captain's Clock, Country Coffee Table, Rooster Folk-Art Silhouette, Harvest Basket, Bird Push Toy, 18th-Century Pencil Post Bed and Nightstand, Bookcase Desk; *Articles:* Wood Movement?; Joining Ring Segments; Drill Bits and Boring; Filling Open-Grained Woods.

Vol. 12 No. 6 Nov-Dec '88

Shaker High Chest, Table Saw Crosscut Box, Country Vegetable Bin, Whale Pull Toy, Colonial Wall Sconce, Treetop Christmas Ornament, Classic Pickup Truck, Contemporary Cradle, Child's Carousel Lamp; *Articles:* Flattening Wide Surfaces with the Hand Plane; Making a Cove-Edged Raised Panel: Core-Box Bit Method; Polyurethane: A Sander For Large Surfaces.

Vol. 13 No. 1 Jan-Feb '89

Shop-Built Disk Sander, Cherry Table, Wall Clock, Rock and Roll Toy, Contemporary Candlesticks, Merganser Decoy, Child's Table and Chairs, Shaker Wall Cabinet; *Articles:* Buying Hardwood Lumber; The Thickness Planer; Making Breadboard Ends; Ebonizing.

Vol. 13 No. 2 Mar-Apr '89

Adirondack Settee, Country Village, 18th-Century Tilt-Top Table, Toy Fishing Trawler, Two Trivets, Folk-Art Cow, Greek Revival Birdhouse, Pine Armoire, Oriental Mirror; *Articles:* Transferring and Enlarging Patterns; Making Tripod Legs; Three Easy Finishes for Pine; The Portable Circular Saw.

Vol. 13 No. 3 May-June '89

Storage Seats, Table Saw Gauge, Oval Extension Table, Nessie Pull Toy, Back Massager, Decorative Wall Key, Country Wall Shelf, Contemporary Mirror, Jewelry Chest; *Articles:* Panel Retainer Disk System; Understanding Circular Saw Blades; Cutting Box Joints; Non-Toxic Finishes; Massachusetts Woodworker Paula Garbarino.

Vol. 13 No. 4 July-Aug '89

Shaker Long Bench, Folk-Art Sign, Toy Farm Tractor and Wagon, Miniature Flower Cart, Kitchen Tongs, Wall Cabinet with Tinsel Art, Stacking Bookshelves, Country Pie Safe; *Articles:* Dealing with Uneven Wood; Tinsel Art; Coping with Your Radial-Arm Saw; Brushing Lacquer; A Visit to a Woodworking Show.

Vol. 13 No. 5 Sept-Oct '89

Country Bake-Room Table, Chippendale Small Chest, Stacking Desk Trays, Pencil Box, Apple Doorstop, Space Shuttle Toy, Marquetry Coasters, Ice Chest with Marbleized Top, Globe Stand; *Articles:* Table Saw Basics; Cutting Full-Blind Dovetails; Marquetry: The Pad Method; Marbleizing; Mount Lebanon Shaker Village: A Museum in the Making; Tool Review: Four Portable Planers.

Vol. 13 No. 6 Nov-Dec '89

Mission Style Trestle Table, Jewelry Box, Kids' Bobsled, St. Nicklaus Carving, Carousel Toy, Box Drum, Dancing Man Folk Toy, Towel Rack, Secretary Desk, Bed Tray; *Articles:* Mortising Butt Hinges; Dado Heads; Marquetry: The Empty Window Method; Aniline Dyes; Lynes Unlimited; Making Toys in a Kansas Chicken Coop.

Vol. 14 No. 1 Jan-Feb '90

Mortise & Tenon Mirror, Weaver's Chest of Drawers, Tissue Box Cover, Band-Sawn Napkin Holder, Grasshopper Pull Toy, Compact Disc Holder, Shop-Built Spindle Sander, Wall-Hung Ironing Board, Tavern Table; *Articles:* Clamps: One Shop Tool You Can't Do Without; How to Hang Wall Cabinets; Marquetry: The Direct Method: A Guide to Waxes and Polishes; Special Section: Back Issue Index.

Vol. 14 No. 2 Mar-Apr '90

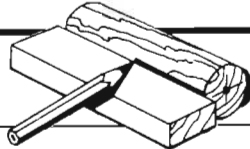
Small Early American Mirror, Shop-Built Sanding Blocks, Cookie Jar Holder, Hourglass, Candle Holder, Toddler Cart, Folk Fiddle, Plant Stand, Santa Fe Bench; *Articles:* Making Drawers; Using Router Bits in the Drill Press; Finishing Outdoor Projects; Making Curved Instrument Sides; A Conversation with Allene and Harold Westover.

Vol. 14 No. 3 May-June '90

Garden Table, Garden Chair, Planter Box, Stackable Shoe Rack, Victorian Wall Shelf, Child's Stepped-Back Cupboard, Cat Push Toy, Tabletop Armoire, Shaker Tall Clock; *Articles:* Japanese Saw Woods; Tung Oil; Making a Wood-

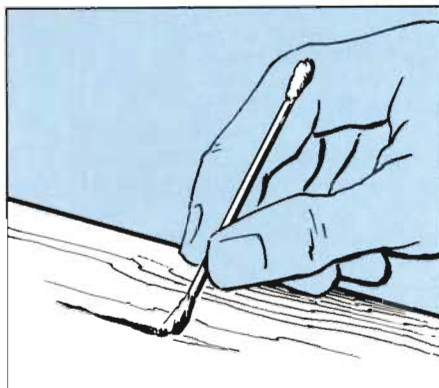


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Shop Tips

I find that cotton-tipped swabs come in handy for a number of touch-up jobs around the workshop. They are great for applying small amounts of stain or paint. And when the job's done, there's no



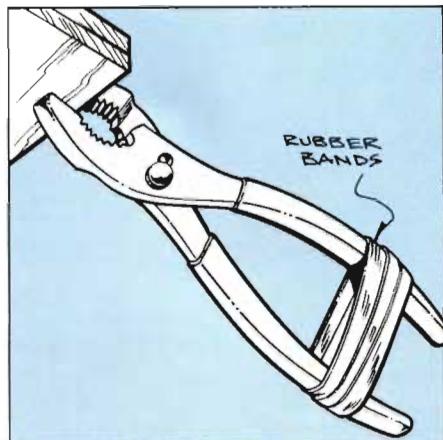
need to spend time (and waste solvent) cleaning a brush—just give the swab a heave-ho.

Robert O. Wendel, Marlboro, N.J.

I enjoy doing fretwork, but that means I'm often faced with the difficult task of sanding the inside edges of narrow slots and tight corners. However, I've found that emery boards are perfect for getting into all those tough spots and smoothing them out. Emery boards can be purchased at any pharmacy, department or grocery store. You'll pay about \$1.25 for a package of ten.

Frederick A. Kleiss, Lewes, Del.

A pair of ordinary pliers can be converted into a light-duty clamp by adding a rubber band to the handles as



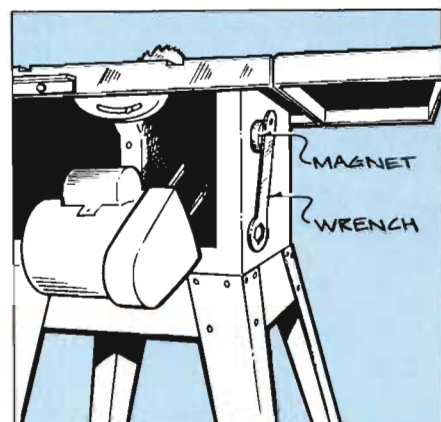
shown. Should you need more clamping pressure, simply add one or two more rubber bands. You could also use a pair of long-nose pliers if you are clamping in a tight spot.

William Hoyle, Jr., Marrero, La.

Before starting to sharpen a chisel, I use a felt-tipped pen to coat the entire cutting edge. This makes it much easier to see how the sharpening is going. I find this trick especially helpful on turning chisels.

*Hiram W. Adams, Sr.
Winston-Salem, N.C.*

A large magnet attached to the side of your table saw makes a handy place to keep the saw blade wrench. Magnets are often sold by electronics supply shops.



Or, better yet, if you can find one, salvage a magnet from an old stereo speaker.

The Woodworker's Journal pays \$25 for reader-submitted shop tips that are published. Send your ideas (including sketch if necessary) to: **The Woodworker's Journal**, P.O. Box 1629, New Milford, CT 06776. Attn: Shop Tip Editor. We redraw all sketches, so they need only be clear and complete. If you would like the material returned, please include a self-addressed stamped envelope.

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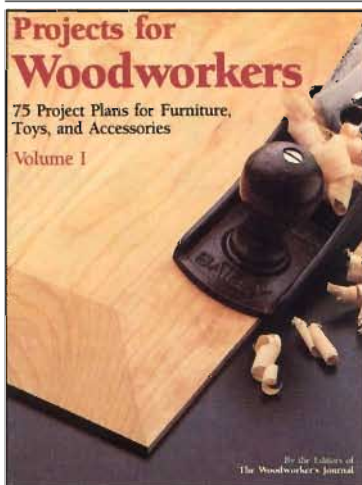


BOOKS

from *The Woodworker's Journal*

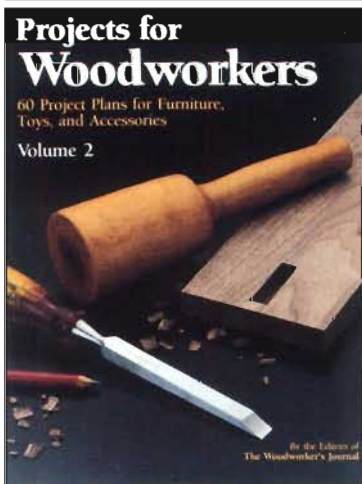
MAKE GREAT GIFTS

You'll find the order form for these books bound in this issue.



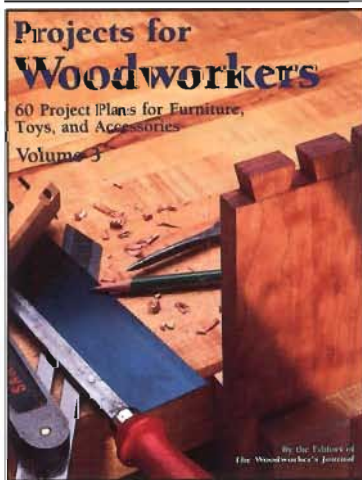
Projects For Woodworkers, Volume 1

Beginning and advanced woodworkers alike will appreciate the full range of styles in furniture, accessories, lamps, clocks, toys and gifts. Of the 75 projects selected from the 1980-81 issues of *The Woodworker's Journal* magazine, plans include a Cabinet-maker's Workbench, Pine Shaker Cupboard, Old-time Icebox, a Cobbler's Bench Coffee Table and a Child's Victorian Sled. Fully detailed instructions, illustrations, and photos.



Projects For Woodworkers, Volume 2

Originally published in the 1982 issues of *The Woodworker's Journal* magazine, all 60 projects were chosen with a wide variety of styles and skill levels in mind. Each project is presented with complete instructions and thorough illustrations. You'll find household accessories like the Desk Caddy, Casserole Dish Holder, and Breakfast Tray easy to build. And you're sure to enjoy the reward of completing more involved projects like the Tambour Desk, Old Danish Chest of Drawers and Swinging Cradle.



Projects For Woodworkers, Volume 3

The best projects from the 1983 issues of *The Woodworker's Journal* magazine—toys, lamps cupboards, chests, cabinets, tables, planters, mirrors, and much more. Clear illustrations and thorough written instructions make each project easy-to-understand and fun to build. A book you'll want to keep within easy reach of your workbench.

101 Projects for Woodworkers

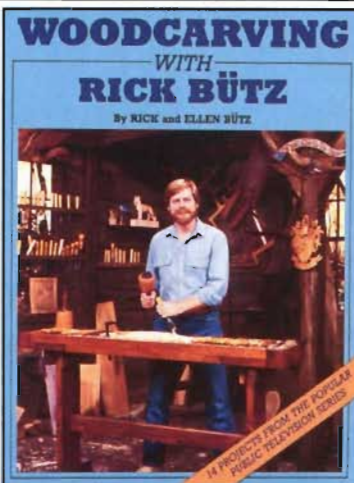
Complete Plans and Instructions for a Variety of Distinctive Furniture Designs, Toys, and Accessories



By the Editors of *The Woodworker's Journal*

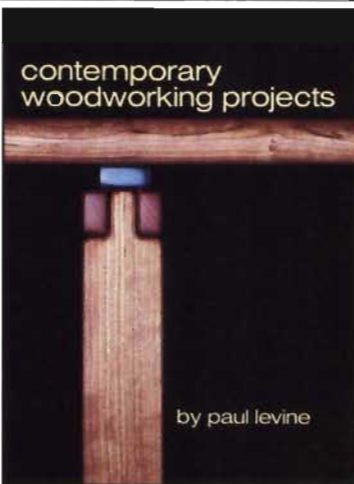
101 Projects For Woodworkers

For the eager amateur just starting out or the craftsman with a shop full of tools, **101 Projects For Woodworkers** features an unparalleled variety of classic projects for everyone. Included in this collection of plans from the 1977-80 issues of *The Woodworker's Journal* magazine are a classic Rolltop Desk, an old-fashioned Porch Swing, traditional and contemporary furniture, clocks, mirrors, home accessories, toys and novelties. Complete instructions and illustrations.



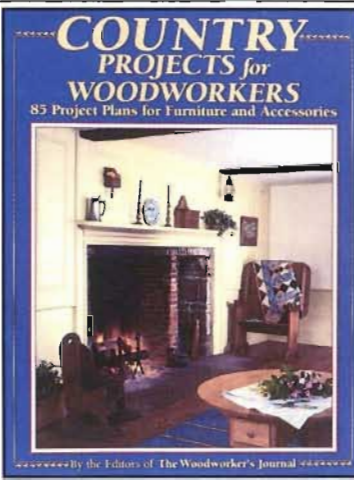
Woodcarving With Rick Butz

Learn woodcarving! With just a few tools and a few hours to spare, you can share in the simple pleasures of carving. Wander into the Black Forest of Germany with a traditional carving of St. Nick, or into a small Russian village with a Dancing Bears folk toy. You'll enjoy a chip-carved Quilt Rack, wildlife carvings, and a Tobacconist's Indian. All 14 projects are fully detailed with step-by-step photos. There are also chapters on tool selection, sharpening, whittling, chip and relief carving.



Contemporary Woodworking Projects

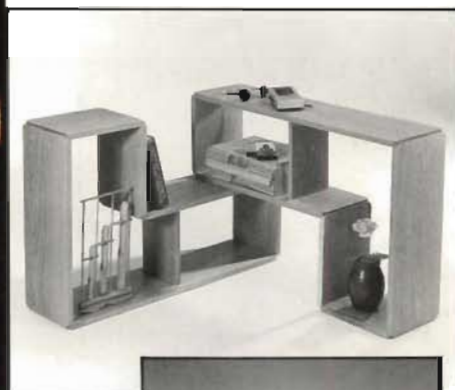
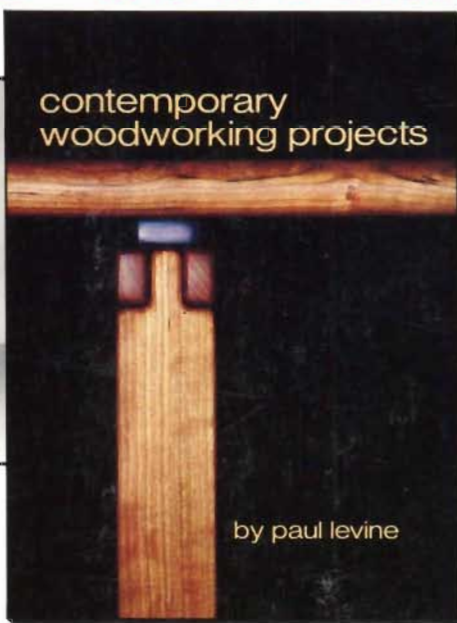
Paul Levine guides woodworkers of all skill levels through room-by-room chapters of coordinated furniture and accessories. The clean angles, sturdy joinery and special techniques are made easy to master with step-by-step instructions and illustrations. Among the 40 handsome projects are a matching Love Seat, Chair and Ottoman set, an Oak Credenza, a Platform Bed, and a Japanese Shoji Lamp. Children will enjoy their own table and chair set, puzzles and a great box of dominoes.



Country Projects For Woodworkers

If building the simple, sturdy furniture of the old cabinetmakers appeals to you, then you'll want this collection of the best country projects from the 1980-84 issues of *The Woodworker's Journal* magazine. 85 complete plans range from weekend projects like Colonial Candlesticks and Fireplace Bellows to more challenging projects such as a Shaker Chest of Drawers, a Stepped-Back Hutch, and an 18th Century Trestle Table. Some plans are also found in *Projects for Woodworkers*. Volumes 1, 2 and 3.

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Next Issue . . .



*Santa Fe
Chair*



*Step
Stool*



*Connecticut
River Valley Highboy*

We're really excited about the January/February 1991 issue. Heading the list is our reproduction of a Connecticut River Valley Highboy—a fine example of 18th-century craftsmanship. We'll show you how to make the lower section in January/February. The upper section will be covered in March/April.

A number of readers have asked for more Santa Fe style furniture, so we've worked up plans for this handsome chair along with a matching side table. Traditionally, much of this furniture was painted, but it can also look good with just an antique stain. We show you how to do both.

You'll be hard pressed to find a commercially made step stool that looks as good as ours. It's also easy to make, so you may find yourself building several for around the house.

Plus you'll find six more projects and some great techniques articles to help keep your workshop a busy (and happy) place this winter.

The Editors