The Woodworker's Journal

Vol. 12, No. 2 $3.00

Crystal Regulator Clock

Included in this issue:

Shaker Carrier
Folk Harp • Contemporary Box
Early American Candlesticks • Tier Table
Arrow Wall Decoration • Country Wall Box • Key Cabinet

March/April 1988

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The Woodworker's Journal

MARCH/APRIL 1988 VOLUME 12, NUMBER 2

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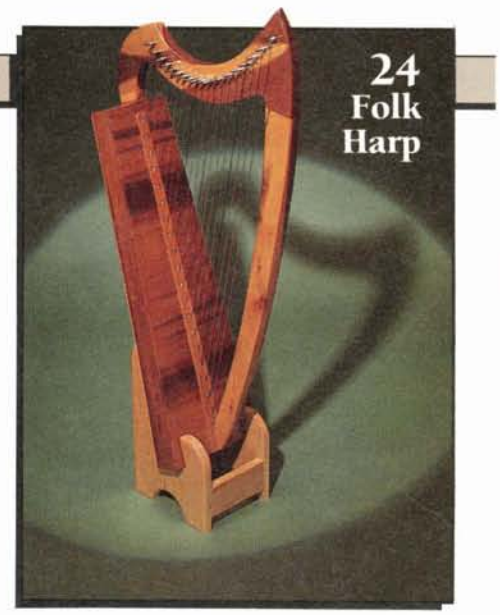
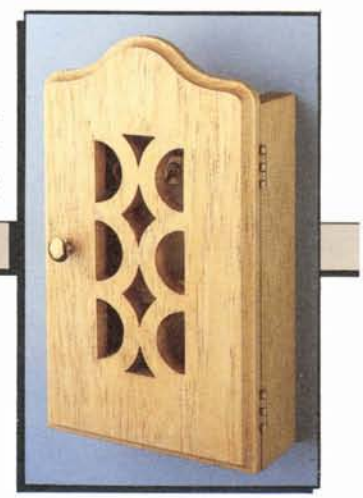
DEPARTMENTS

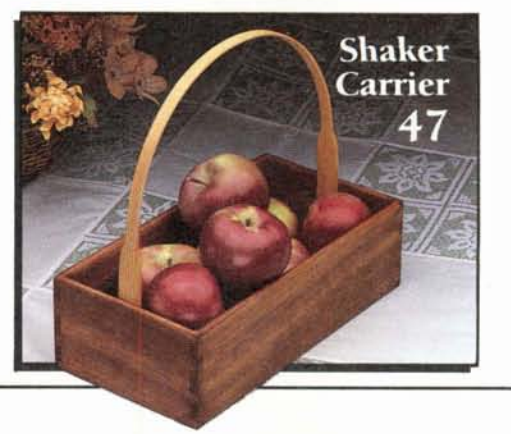


24 Folk Harp



42 Key Cabinet

PROJECTS



Shaker Carrier 47

Shoptalk

Practice, Practice

Everybody envies the pianist who sits down and effortlessly plays any request. We think how wonderful it would be to have such a talent. But do we also envy the years of effort that were required to reach that point of seemingly "effortless" performance? Most of us have a tendency to wish for the rewards, but would prefer to avoid the years of practice required. That's human nature.

In spite of the Bill of Rights, we are not all created equal; Mother Nature doesn't use a cookie cutter. Some are born smarter, or stronger, or with better eye-hand coordination and, for that reason, are able to achieve mastery sooner than others. Except for the very rare genius, no worthwhile skill comes easily. It takes effort and practice, and the same applies to woodworking.

First you learn the basics by doing them. If you cut 25 mortise and tenon joints, I guarantee that the last ones will be considerably better than the first . . . *provided you made a conscious effort to improve.*

As the hours of practice accumulate, the aspiring pianist gains in confidence and satisfaction, and eventually the practice becomes pleasurable. Woodworkers are lucky because their practice is pleasurable to begin with and the results are tangible projects: things that can be admired and put to use.

You too can become a master woodworker and you don't have to be born with a talent for it. All you need is a bit of patience and the self-discipline to do the work *as best you can* with the realization that to *improve, you must move on to more challenging projects.*

It's not necessary to make every joint like a Chinese puzzle (unless you enjoy that sort of thing), but difficult joinery does become easier as you keep at it. And when someone admires the softly gleaming results of your woodworking "talent," be honest and say that you may have been born with the inclination, but the talent took a bit of doing.

In This Issue

This issue has some rather unusual projects. First and foremost among them is the lovely Crystal Regulator Clock that fits in well with most any furniture style. It's got just the right degree of challenge to help you develop your skills. Small clocks are great practice for if you botch a cut, there's not much waste.

We also offer plans for a 2½ octave Folk Harp. The joinery is not difficult, and even if you never learn to play "Greensleeves," it's a lovely conversation piece.

A New Book

For those of you who were not able to obtain all 1982 issues of *The Woodworker's Journal,* we have just published ***Projects For Woodworkers, Volume 2*** which contains plans for 60 of the popular projects from those issues. Ordering information is on page 12.

Jim McQuillan

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BW-1458B	14"	⅝"	BENCH	249.00
BW-1758B	17"	⅝"	BENCH	269.00
BW-1412F	14"	½"	FLOOR	269.00
BW-1458F	14"	⅝"	FLOOR	319.00
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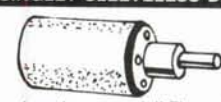

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Illustration shows ½" Adapter inserted

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2" x 3"	15.50	3" x 4½"	22.50	½" Adapter	1.50
2½" x 3"	16.00	2½" x 6"	25.50		

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SF-015	1	750	2-BAG	319.00
BW-002A	2	1182	2-BAG	429.00
BW-003A	3	1883	4-BAG	595.00
SF-003	3	1883	4-BAG	795.00

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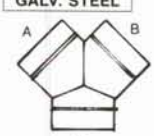

A	B	C	PRICE	MODEL
5"	5"	8"	$21.50	Y-85
6	6	8	22.00	Y-86
6	6	7	21.00	Y-76
5	5	7	20.00	Y-75
5	5	6	17.00	Y-65
5	5	5	16.50	Y-55
4	4	5	16.00	Y-54
4	4	4	16.00	Y-44
3	3	4	16.00	Y-43

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MODEL	PRICE
R-4-3	$ 9.50
R-5-4	9.50
R-6-5	10.50
R-6-4	10.50
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R-7-6	11.50
R-8-5	12.50
R-8-6	12.50

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Letters

I want to make two Japanese sliding doors but I don't know where to get rice paper. The Japanese call this paper shoji gami. Can you help?

Cecilio E. Lecusay
Tampa, Fla.

Rice paper can be ordered from the Tonee Crafts Corporation, 108 Worcester Street, New York, NY 10012 (telephone: 212-966-4213).

I'm making the Curio Cabinet project that was in your November/December 1987 issue. Figure 9 on page 25 shows a ¼ in. distance from the auxiliary fence to the blade, yet the drawing of the finished foot (page 36) shows a distance of ⅛ in. above the cove. Which is correct?

Niven Baird
Carlisle, Penn.

In Figure 9, the distance from the auxiliary fence to the blade should be ⅛ in., not the ¼ in. dimension shown.

I recently purchased a brand-name try square and used it while making several projects. During that time I noticed squareness problems that I hadn't encountered in the past. After checking and rechecking my equipment I finally examined my new square. Guess what? It wasn't square.

In the future I'll check a square for accuracy before buying it. It's easy enough to do right in the store. Lay the square along a straight, flat edge of a countertop and scribe a light line. Then turn the square over and repeat the procedure making sure to start the new line at the same point as the first. If the tool is perfectly square, the second line will be exactly on top of the first line. Any divergence between the two lines will be equal to twice the error. If that error is unacceptable, keep looking. Using this method at my hardware store, I had to check eight try squares — all the same type and brand — before finding one that was square.

Jim Benini
Kersey, Penn.

I've been a self-employed cabinetmaker for 15 years and just love working with wood. Along with a custom building business we also have a small gift shop. We've had great success with the apple shaped Country Basket that was in your July/August 1987 issue. It's been one of our best sellers. We made ours from pine and stained them with Minwax's Special Walnut Wood Finish. Our customers really like the look of the wood grain. Subscribing to your magazine has been one of the best investments we've ever made.

Jim Benedict
Westerlo, New York

The Kicking Donkey Whirligig project featured in your March/April 1986 issue requires a length of 3/16 in.

diameter brass rod to be used for the drive shaft. I've checked locally and have been unable to locate brass rod in that diameter. Can you provide me with a mail-order source for it?

William H. Pepper
Cleveland, New York

You can get 3/16 in. diameter brass rod via mail-order from Allcraft Tool and Supply Company, 100 Frank Road, Hicksville, NY 11801. It's their part no. MPL-65 and the current price is $.80 per foot.

I was recently reading the January/February 1987 issue of your magazine and came across a letter from a subscriber who felt that you feature too many Shaker-style projects. I disagree. In my opinion you are not including enough and I would like to see more to help keep the Shaker style alive.

Marc Dutko
Fairfield, Conn., Age 14

I've found a good use for my son's broken baseball bat. The tip end provided the stock to make the small diameter Turned Shop Mallet that was featured as a project plan in your September/October 1987 issue. Granted, it won't last as long as one made from lignum vitae or maple, but the price sure is right.

Gerald R. Randolph
Danbury, Wisc.

Your January/February 1988 issue had plans for a single-door, single-drawer Early American Pierced Tin Cabinet. The article mentions that back in your March/April 1982 issue you had plans for a cabinet that was similar except that it had two doors and two drawers. Is there any way that I can get plans for that earlier design?

George McLeod
Greenville, South Carolina

That back issue is out of print but the plan can be found in our just released book "Projects For Woodworkers, Volume 2." The book includes 60 project plans, all of them taken from the 1982 issues The Woodworker's Journal. *Ordering information can be found on page 12 of this issue.*

Can you tell me where to get the spice bottles that were used with the Spice Rack project on page 50 in your September/October 1987 issue?

B. Tuttle, Cleveland, Ohio

Clear plastic spice bottles, each with a white plastic screw cap and a shaker insert (the insert is removable for filling) can be ordered from Meisel Hardware Specialties, P.O. Box 70, Mound, MN 55364. The bottles measure approximately 1 1/16 in. diameter by 3 3/8 in. high and have a capacity of two ounces. Order part no. 151. The current price is 35¢ each.

Readers' Information Exchange

Looking for an owner's manual for an old band 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 hopefully one of our readers will have an answer for you. Due to space limitations, we will be unable to list all requests, but we will include as many as we can.

I have been looking for a wooden churn and have been unable to find a pattern. Can anyone please tell me where I might find one?

Jackie Pierce
Rt. #6, Box 77
Shelbyville, TN 37160

I need 6.5 inch diameter by 0.5 inch width tires for the wheels (3 ea.) on a Central Machinery 14 inch band saw. I'd also like to know if Central Machinery is still in business and, if so, what their address is or if any parts supply houses will provide tires of this size.

Harvey T. Jones
3027 Brae Burn St.
Sierra Vista, AZ 85635

I have a Comet Cub radial arm saw that I bought in 1952 and, after 35 years of use, the collet that I got with it has broken. I'm in dire need of a replacement. Does anyone know where I might find one? I haven't had any success locally.

Frank Christie
2731 Kensington Rd.
Redwood City, CA 94061

I've been unable to locate plans for a Murphy-type, fold-up, wall-mounted bed. Does anyone know where I can locate such plans?

John C. Wilfong
5014 Mahan Dr.
Tallahassee, FL 32308

I'm looking for an owner's manual and parts list for a Craftsman 6 inch planer, model no. 103.0801.

Henry Kurowski
3826 Palm Ave.
Lorain, OH 44055

I bought a Boice Crane shaper several years ago, but it came without a fence. I can't find a model number on it, but the machine has a pedestal shape and stands about 17 inches high without the homemade stand. The table is 27 inches wide by 20 inches deep and has a series of four randomly placed holes drilled in it. It came with a cutter guard that attaches to the back edge of the table. After three years of looking for a fence for this machine, any help anyone can give me would be greatly appreciated.

Warren E. Young
22 Billings Court
Burlington, VT 05401

I need some help and information on a tool accessory for a table saw. I accidentally threw away a set of "Wobbler" washers that were used to cut dadoes. They were about 2½ inches in diameter, and had a ⅝ inch bore. They were aluminum and tapered to allow for angling the 8 inch blade for various slot widths. It's an old tool and very useful as you can get a fine adjustment using saws of various thicknesses. A lot of cutters on the market are limited to 1/16 inch increments due to the chippers used. I've checked many catalogs and can't seem to find one. If anyone can help me find a manufacturer or distributor, I'd appreciate it.

Herman Roy
1 Everett Ave.
Bow, NH 03301

I need a manual and parts list for a Craftsman 8 inch table saw, model no. 103.22160, which is also marked King Seeley.

E.L. Whiteside
5539 Quincy St.
Hinsdale, IL 60521

We need an owner's manual and parts list for a Craftsman 12 inch band saw, model no. 103.24250, a Craftsman wood lathe (8 inch swing, 32 inches between centers), model no. 103.23870, and a Craftsman 24 inch jigsaw, model no. 103.23390.

Dan P. Hostetler
14631 Hayes Rd.
Middlefield, OH 44062

Events

We will be glad to list as many events of interest to woodworkers as space permits. Listings are free and may include shows, fairs, competitions, workshops and demonstrations. The issue closing date is the 1st of the 2nd month preceding the cover date (5/1 for July/August; 7/1 for September/October). Please address announcements to the Events Department.

New England:

Among the weekend workshops offered by the Brookfield Craft Center are: Half Hull Model Workshop, Mar. 4-6; 18th Century Chair Making, Mar. 12-13; Working with Formica, Mar. 26-27. For information, contact the Brookfield Craft Center, P.O. Box 122, Brookfield, CT 06804; (203) 775-4526.

Woodworking World — The Boston Show, Apr. 29 - May 1, Bayside Expo Center, Boston, Mass.

National Working With Wood Show, Apr. 8-10, Center of New Hampshire, Nashua, New Hampshire.

East North Central:

National Working With Wood Show, Apr. 15-17, Canton Civic Center, Canton, Ohio.

Woodworking World — The Columbus Show, Mar. 11-13, Veterans Memorial Hall, Columbus, Ohio.

West South Central:

"Works in Wood 1988," Apr. 9 - May 8. For exhibition info, contact Tony Bilello, Gallery B, 11121 Rodney Parham Rd., Little Rock, AR 72212. (501) 221-0266.

Furniture designer Frank Ferraro will conduct a 5-day workshop in furniture design and construction May 16-20. Contact Frank Ferraro, Gallery B, 11121 Rodney Parham Rd., Little Rock, AR 72212. (501) 221-0266.

The Houston International Festival, national juried crafts exposition, Apr. 9-17. For info, call (713) 654-8808.

South Atlantic:

The Florida Woodworking Show, Mar. 4-6, Curtis Hixon Convention Center, Main Hall, Tampa, Fla.

The Atlanta Woodworking Show, Apr. 8-10, Georgia International Trade Center, Hall B, College Park, Ga.

East South Central:

The Arrowmont School of Arts and Crafts will hold a one week class in Woodturning and Design, Mar. 27 - Apr. 1. For information and a Spring catalog, contact the school at Box 567, Gatlinburg, TN 37738; (615) 436-5860.

West North Central:

Application deadline for the 18th annual "Art in the Park" show to be held May 14-15, 1988 in Clinton, Iowa is April 1st. Fine arts and fine crafts only. Juried by five slides. $40.00 fee. No commission. Cash awards. Clinton Art Association, Box 132, Clinton, IA 52732. Phone: (319) 259-8303.

The second annual ACC American Crafts Expo, Apr. 6-10, St. Paul Civic Center, St. Paul, Minn.

Mountain:

Cabinetmaking, woodcarving and woodturning are featured in Western Montana College Industrial Arts Department's Annual Festival of Arts and Industry, Apr. 29-30, Dillon, Montana.

Pacific:

The Northern California Woodworking Show, Mar. 25-27, San Jose Convention Center, Exhibit Hall, San Jose, Calif.

The Southern California Woodworking Show, Apr. 29-May 1, Los Angeles Airport Hilton, Pavilion, Los Angeles, Calif.

National Working with Wood Show, Mar. 11-13, Long Beach Convention Center, Long Beach, Calif.

Canada:

The Quinte Wood Show, juried competition, Mar. 18-20, Ben Bleeker Auditorium, The Fairgrounds, Belleville, Ontario.

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/disc 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. ..... J, L, MT, S, SS, TP, TS
P.O. Box 312, Dept. 261 — Catalog free
New Castle, DE 19720

Ashman Technical Ltd. ..... BDS, BG, BS, DP, J, L, MT, S, SS, TP, TS
351 Nash Rd., Dept. WJ1 — Catalog free
Hamilton, Ontario
Canada L8H 7P4

Emco USA ..... BDS, BS, J, L, MT, S
P.O. Box 218118-WJ — Catalog free
Columbus, OH 43221-8118

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

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

J. Philip Humfrey International ..... BDS, BS, DP, J, L, MT, S, SS, TP, TS
3241 Kennedy Rd. Unit 7 — Brochures free
Scarborough, Ontario
Canada M1V 2J9

R.B. Industries ..... MT, S, SS, TP
1801 Vine St., Dept. WJ11 — Brochures free
Harrisonville, MO 64701

Sisco Supply ..... BDS, BG, BS, DP, J, L, MT, S, SS, TP, TS
4050 Williston Rd., Dept. WJ — Catalog $1.00
S. Burlington, VT 05403

The Source ..... BDS, BG, BS, DP, J, L, MT, S, SS, TP, TS
7305 Boudinot Dr., Dept. WJ — Catalog $3.00, refundable
Springfield, VA 22150

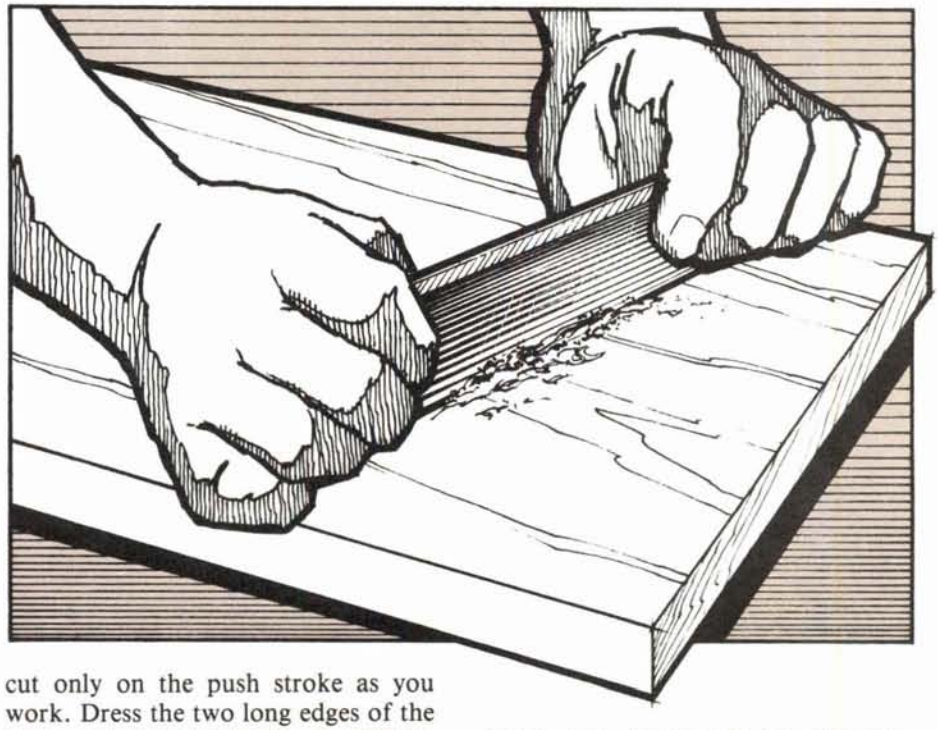
Tools of the Trade ..... BDS, BG, BS, DP, J, L, MT, S, SS, TP, TS
100 Federal Rd., Dept. WJ — Catalog free
Danbury, CT 06810

Wilke Machinery ..... BDS, BG, BS, DP, J, L, MT, S, SS, TP, TS
120 Derry Court, Dept. WJ — Catalog $1.00
York, PA 17402

Williams & Hussey Machine Co. ..... L, TP, MT
P.O. Box 1149, 86 Souhegan St. — Brochures free
Wilton, NH 03086

Woodmaster Tools, Inc. ..... BDS, MT, SS
2908 Oak — Brochures free
Kansas City, MO 64108

Use and Sharpening of the Hand Scraper



Perhaps by virtue of their simplicity, scrapers are rarely fully appreciated by the woodworking hobbyist. Somehow it is our nature to equate value with complexity, and being nothing but a section of sheet steel, we assume the function of the scraper must be limited.

In truth, scrapers are recognized by master cabinetmakers as one of the most useful and effective wood-finishing tools available. In experienced hands, they can be used for practically any finishing purpose, from removing rough mill marks and final smoothing to removing dried glue, veneer tape, and even old finishes.

There are three common scraper shapes: the rectangle, gooseneck (also called french curve), and the curved-end type (Fig. 1). We'll limit our discussion to these three basic hand-scraper shapes. The cabinet scraper, which is somewhat different in that the cutting edge is beveled, and the blade is held fast in a spokeshave type handle, will be covered in a future article.

How It Works

Although it's called a scraper, this tool does not really scrape the wood. When properly burnished, the fine hooked edge of the scraper (called the burr) actually cuts a very fine shaving off the surface of the wood — so fine it may be only one or two cells thick. The effectiveness of the scraper depends almost entirely on the success of the sharpening or burnishing process used to create the burr. Therefore we'll concentrate on the sharpening technique. Our illustrations show the rectangular scraper since that is the one most often used.

Dressing the Edge

This step may not be necessary if you purchase a high-quality scraper blade with a true polished edge ready for burnishing. Dressing the edge is necessary where the edge is very rough, badly worn or uneven. To dress the edge, first clamp the scraper blade securely in the bench vise between two blocks of wood, as shown in Fig. 2. Then, using a flat, fine-cut mill file, true the edges of the scraper. Note that, with the inside curve of the french curve and curved end scrapers, a round file will be needed. The mill file should cut only on the push stroke as you work. Dress the two long edges of the rectangular scraper blade, in addition to those edges of the other blades you plan to use.

Honing the Edge

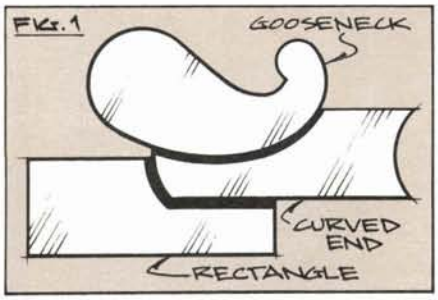
If you intend to use the scraper mainly for rough work such as removing mill marks prior to sanding, there is no need to further hone the edge once it has been dressed with the mill file. For finer work, however, this honing step is a must. Since we use the scraper for a variety of finishing purposes, we prefer to have several different cutting edges available. Therefore we'll leave one edge rough, and hone the remaining edges with a medium grit oil or waterstone. For very fine work, we'll follow the medium grit oil or waterstone with a hard Arkansas or fine waterstone.

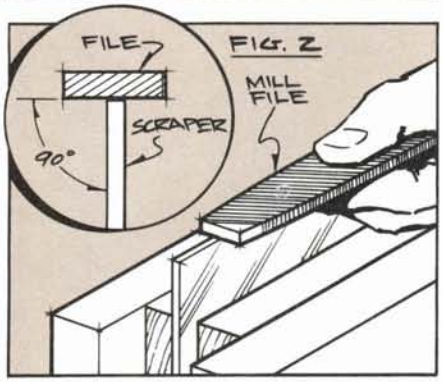
Honing with the oil or waterstone is very simple. Just be sure the stone is held perfectly flat and square to the edge being worked. Stroke alternately on the edge and sides, as shown in Figs. 3 and 4, and continue until the mill file cutting marks are smoothed out. From a practical aspect, the surface difference produced by an edge that has been honed with both medium and fine stones, as opposed to that produced by an edge honed only with a medium stone, is difficult to discern unless one looks very closely, so don't expect a significant improvement.

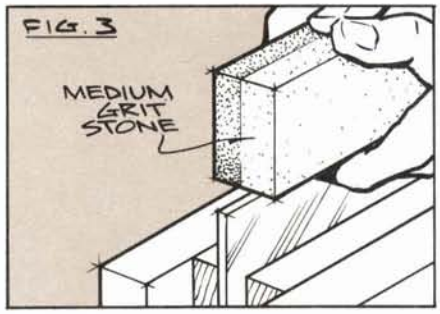
Burnishing

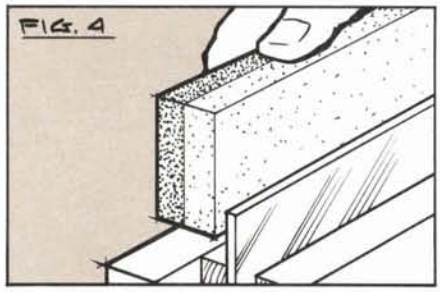
Burnishing is the action that produces the cutting edge on the scraper. Very basically, a piece of steel harder than the scraper is drawn along the scraper edge with some force, thereby forming the burr or hook that is the scraper's cutting edge. While almost any piece of hardened steel —from a chisel to a round bar — can be used as a burnisher, we prefer to use a jeweler's burnishing tool (about $5.00), which is ideally suited to this purpose. If you decide to use something else as a burnishing tool, just be sure that it's hardened. Hardened steel resists filing.

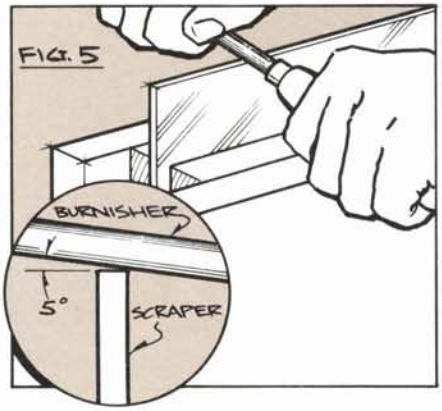
To burnish, first fix the scraper in the vise between two blocks, as before, and apply a drop of oil to both the edge and the burnisher. Then, with the burnisher held firmly and at a slight angle to the edge being worked (about 5 to 7 degrees), draw it slowly and evenly forward along the entire edge, maintain-

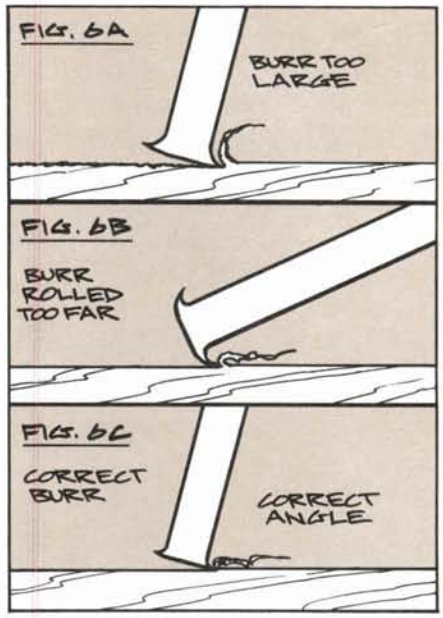


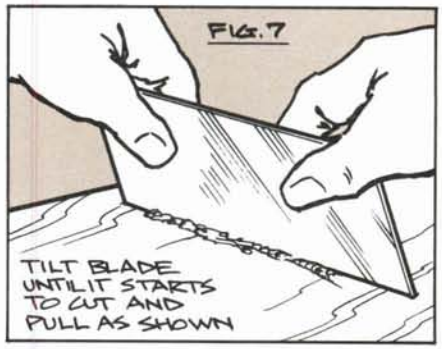












ing even pressure and this same angle all the way (Fig. 5). Additional passes with the burnisher will increase the burr.

Perhaps the two biggest mistakes novice woodworkers make when they first try burnishing a scraper is to "roll" the burr over too far, resulting in a cutting angle that is too severe, or they press too hard and burnish excessively, creating an oversize hook, which tends to catch and dig. Fig. 6A shows how a scraper with too large a burr digs into the wood, while Fig. 6B shows a scraper with the burr rolled over too far, requiring that the blade be held at an angle very nearly parallel to the surface being worked. Fig. 6C indicates how a scraper with the correct hook angle actually cuts a super-thin shaving, resulting in a very smooth finished surface. While we dress and burnish both sides of the two long edges of the scraper, leaving the ends square so they will be easier to grip, some cabinetmakers prefer to dress and burnish all the available edges.

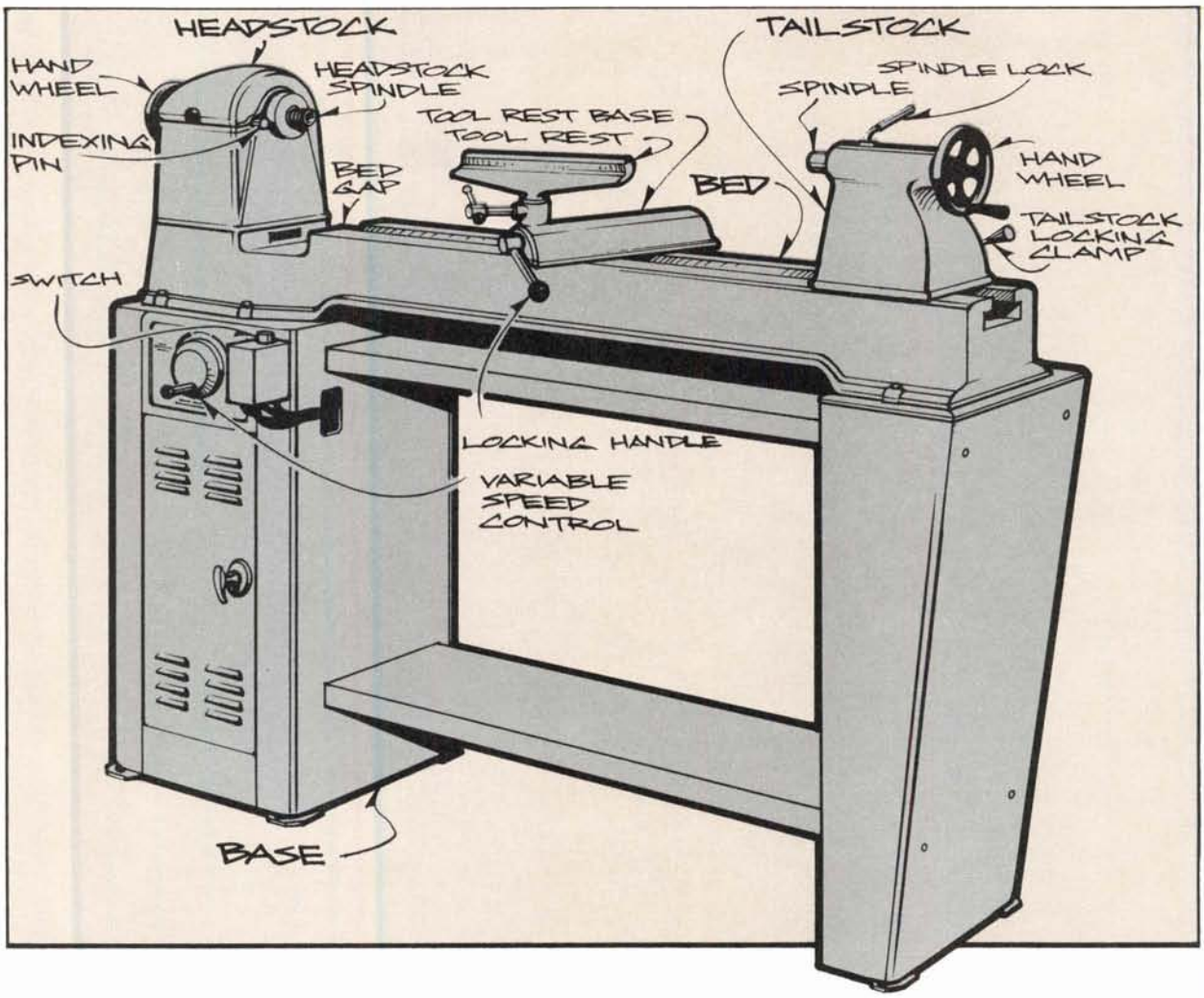
Obtaining the optimum hook angle and burr is really a matter of trial and error and experience. Too small a burr and the scraper will dull quickly; too large and the surface produced will be fuzzy and not smooth as desired. When using the file, sharpening stones, or burnishing tool, always take great care, since any slip could result in skinned knuckles or, worse yet, a serious cut. Gloves are one way to cut down on the possibility of injury.

Since the scraper edge will dull with use, it will periodically require resharpening. One popular technique has you use the burnisher to first flatten out the old burr and then draw it back up again. We prefer to dress the edge with the file and sharpening stone, and start with a fresh edge to draw the burr up. The scraper won't last quite as long, but by starting new each time, you're assured of an optimum cutting edge. You'll know when the scraper edge is dull or has not been burnished correctly, since the scraper will produce dust rather than fine shavings.

How It's Used

The scraper must always be worked parallel to the grain direction, but can be either pulled or pushed depending on the job at hand and the technique you feel comfortable with. However it is used, the way it's held tends to flex the blade slightly, which produces a very shallow scalloped cut, as shown in Fig. 7. The most effective action is to hold the scraper at a slight diagonal to the grain, reversing this angle with each successive pass. Since the scraper can become very hot as you work, a pair of light garden gloves may be a necessity.

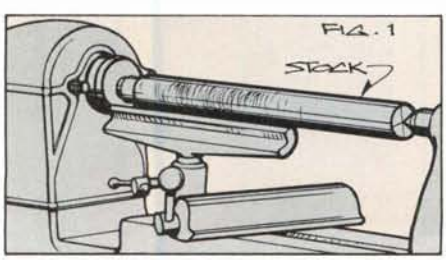
While the scraper is generally held at about 75-80 degrees to the work surface, the actual angle is a matter of feel, since only through experience will you know exactly when its cutting action is the most effective. Remember that when sharpened and used properly, the scraper should produce fine shavings, rather than dust. You'll need to spend time and experiment with both burnishing and using the scraper to develop the touch that this tool requires. WWJ

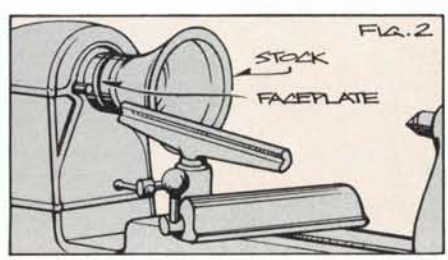


The Lathe: Basic Setup

With the wide assortment of power tools now available, woodworkers can easily lose touch with the manual skills that help make the hobby fun and interesting. But the lathe offers the versatility of a modern power tool while maintaining the feel and touch craftsmen have experienced for centuries.

The two most common types of lathe operations are spindle turning (Fig. 1) and faceplate turning (Fig. 2). The lathe can also be used to sand, grind, buff and bore. For example, it's an excellent tool for drilling a perfectly true hole in a lamp base. All you need to do is replace the dead center with a key chuck and drill bit.





The following basic instructions will get you to the point where you turn on the switch. In later issues we'll cover basic spindle turning, faceplate turning, and selecting and sharpening tools.

With the lathe, as well as with any other power tool, you should think of safety first. Since your lathe is probably somewhat different than ours (see lathe illustration), you should be sure to thoroughly read the owner's manual and carefully follow the instructions for assembly and setup.

Getting the stock ready for turning is also critical for safe operation. If the workpiece is off-center when you first start the lathe, it could fly out from between the centers. Or with a

faceplate turning, it may break free from the mounting arrangement. So spending an extra few minutes to square up the stock and find the centers on the end grain will pay dividends in safety as well as accuracy.

As shown in the lathe illustration, the primary parts of the typical lathe are the headstock, the bed, the base and the tailstock. In a spindle turning, the workpiece is mounted between the live center, which is attached to the headstock spindle, and the dead center, which is attached to the tailstock spindle. In a faceplate turning, the faceplate mounts directly to the headstock spindle.

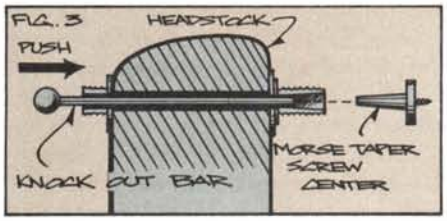
Live centers can mount one of two ways. The most common configuration is a Morse taper (Fig. 3). The headstock spindle will be threaded on the outside to accept a threaded faceplate, or center, and have a Morse tapered recess on the inside to accept the various Morse taper live centers. The weighted knock-out bar, shown in Fig. 3, is used to loosen the tapered live center. It is simply inserted into the opposite end of the headstock and used to tap the live center out.

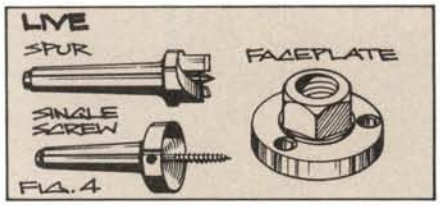
The dead center tailstock spindle will not have an exterior thread, but simply the Morse taper which can accept any of three dead centers or the Morse taper chuck.

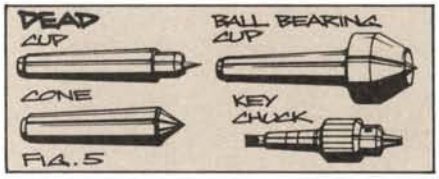
Types of Centers

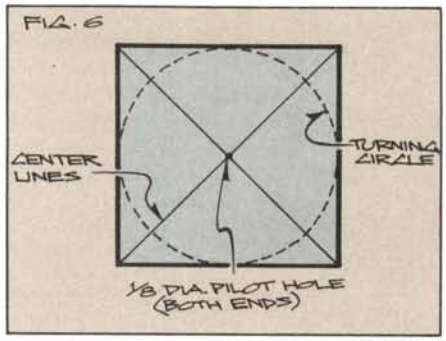
There are three types of live centers (Fig. 4). The spur center, which is used for spindle turning, has a center pin and flutes that hold and drive the workpiece. The single screw center is used for very delicate turnings, and the faceplate is used for bowls and other open-faced turnings.

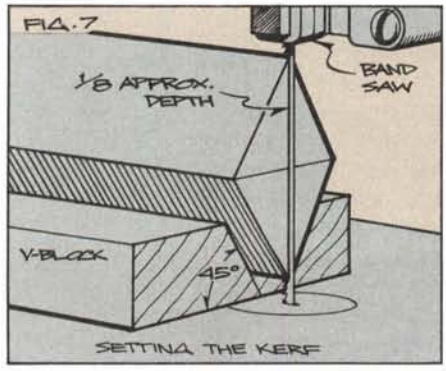
There are several options for dead centers (Fig.5) including the cup, the cone, the ball-bearing cup and the key chuck, which is used primarily for boring. We prefer the ball-bearing cup center, because the center turns with the workpieces, rather than burning into it. The ball-bearing cup center, which employs a cup and cone configuration, also tends to hold the grain together. With the cone center, there is danger that the cone may split the stock.

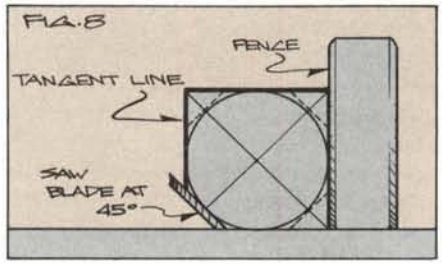












Finding the Centers

After truing and squaring the stock, use a straightedge to run lines from corner to corner on each end as shown in Fig. 6. The intersection of the two lines will be the center. Mark it with a prick punch or an awl.

Next drill a shallow pilot hole in each center, ⅛ in. in diameter. Using a brad-point drill insures that the bit won't wander from the center.

Setting the Kerfs

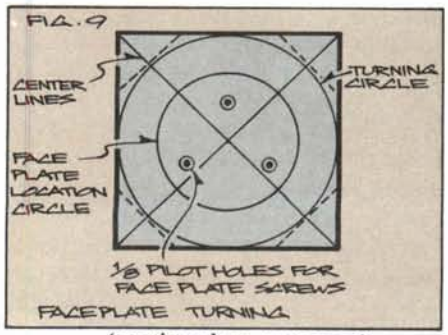
Now make shallow saw cuts, or kerfs, from corner to corner on one end, using either a backsaw or a band saw. A V-block used as a guide with the band saw will make cutting the kerf easier, as shown in Fig. 7. With a longer workpiece on the band saw, it may be difficult to hold up one end and cut the other at the same time. We suggest setting one end down and using the backsaw. You can use your thumb against the side of the saw to carefully control the cut.

Wide Stock and Faceplate Turnings

If the stock is thicker than 2 in., trim off some of the waste, making the square an octagon. First, run a circle as large as will fit inside one end and draw a 45-degree tangent line, as shown in Fig. 8. Then set the table saw to 45 degrees and rip off the wood outside the tangent line. Make all four cuts at the same setting to maintain balance in the workpiece. Follow the same steps for all faceplate turnings, unless they are too short to ride safely against the table saw rip fence. Use a band saw to trim short faceplate turnings.

Setting the Workpiece Between Centers

After finding the centers, setting the



(continued on next page)

kerf and trimming off the waste, you're ready to set the workpiece in the lathe.

Make sure the lathe is set for the slowest speed before mounting the workpiece. Put the end with the kerf cuts in the live or spur center at the headstock. Bring the tailstock up to the workpiece and slide the dead center into the pilot hole. Set the tailstock locking clamp and turn the hand wheel to advance the dead center, anchoring the workpiece securely. To set the workpiece firmly onto the spur center, tap the tailstock end of the workpiece with a mallet and block of wood. Then give the hand wheel another twist to secure the workpiece, back it off slightly, and tighten the spindle lock.

Some turners prefer to remove the spur center and then set it into the workpiece with a mallet. Some tap a spare spur center into the workpiece so they won't need to remove the one on the lathe. The notches left in the workpiece will then fit into the flutes on the spur center.

If the lathe doesn't have a ball-bearing dead center, apply oil or wax for lubrication before starting the tool. You'll need to add lubricant periodically as you work.

Mounting Faceplates

To mount a faceplate turning, find the center of the workpiece and draw a circle the same size as your faceplate, as shown in Fig. 9. That way you'll hit the exact center when you screw it on. There is no need to cut kerfs. Just drill pilot holes for the mounting screws. For working close to the faceplate, glue a block of scrap wood to the workpiece. That way the screw holes will be in the scrap, which you can saw off afterward. You can also glue kraft paper between the two pieces, and split them apart with a chisel after turning. Just be sure there are no voids in the glue.

Some Other Considerations

When threading a faceplate into the headstock spindle, remember to hand tighten only. Using motor torque will make it very difficult to remove the faceplate from the headstock.

Don't overtighten the workpiece between centers, especially if your lathe doesn't have a ball-bearing dead center, since a standard dead center may burn into the wood. Also, small-diameter turnings may start to bow and whip with too much pressure. A little practice will give you the feel for how much pressure to use and still prevent friction from burning the wood. If the center does start to work into the wood, the piece may chatter. In that case, stop the lathe and tighten the piece.

Don't forget to lock the tailstock and adjusting mechanism every time you reset the workpiece or change the pressure.

Setting the Tool Rest

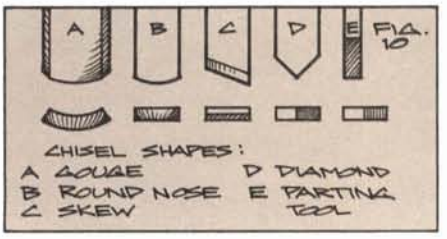
After locking down the tailstock, set the tool rest so the cutting edge of the chisel is slightly above the center of the workpiece. Placing the cutting edge below the center will cause workpiece to grab the chisel, pulling the edge down and throwing the handle up. So be sure the tool rest is at least above the center. One-eighth in. is often used as a starting point. Raising the tool rest also tends to slightly increase the cutting or slicing action of the chisel. With a lower tool position, the chisel will scrape more than cut.

Before You Begin

Before starting the lathe, rotate the workpiece by hand to insure the tool rest is as close as possible with full clearance. Stand off to the side when you turn on the switch in case the piece flies off. Initial start-up is the likely time for the workpiece to come loose if it's unbalanced. Again, truing up the piece is very important.

When You Begin

When you start turning, hold the chisel firmly with the palm of your outboard hand squarely on top of the handle. That way you have the tool under control if it grabs, as it will from time to time, and pushes the handle toward your head. Also hold the cutting edge firmly, but keep your fingers away from the turning.



There are five basic *types of turning* chisels (see Fig. 10) which we'll discuss in detail in our next issue (May/June 1988). In general, use the gouge for turning a cylinder from a block and other tools as needed to cut beads and coves.

We'll also cover spindle-turning basics, and selecting and sharpening lathe tools in our next issue. In the July/August 1988 issue, we'll address basic faceplate turning.

Safety Tips

1. Follow all instructions in the owner's manual.

2. Use all guards and covers.

3. Never wear loose clothing, a tie or jewelry while operating the lathe.

4. Do wear safety goggles or a face shield.

5. Always start the lathe at the slowest speed and don't increase the speed until the workpiece is rounded. Maintain the slowest speed for larger-diameter turnings.

6. Make sure the workpiece is fastened securely between the centers or on the faceplate, and all clamps on tailstock and tool rest are tightened securely.

7. Stop the lathe to make adjustments, take measurements or to clear chips.

8. Keep the floor area clean to prevent slipping.

9. Always know where your hands are when the tool is running.

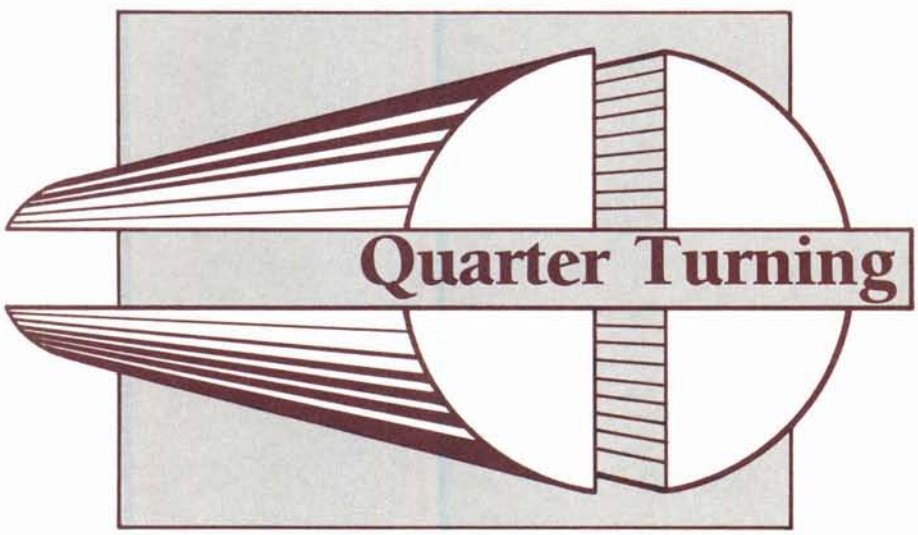
10. Keep a firm grip on the chisel with one hand on top and toward the end of the handle. The other hand should control the cutting edge. Keep your fingers clear of the turning.

11. Always use clear stock — no knots — and always inspect wood to insure there aren't any defects that could make it break during turning. Check to be sure glue joints are tight with no voids.

12. Adjust the tool rest as close to the workpiece as possible. Turn the stock by hand to insure there is adequate clearance.

13. Remove the tool rest during sanding so your fingers don't get caught. WWJ

Special Techniques



Quartered turnings are a fun way to use the lathe to explore an unusual procedure, and make structural members or decorative details for a variety of woodworking projects.

The concept is simple — glue four identical sections of wood together, turn them as one piece on the lathe, and split them afterward to form table legs, decorative edging or corner pieces. What makes the process work is the paper glued between the four sections. The paper provides enough bonding to prevent the piece from flying apart during turning, but is weak enough to allow the sections to separate when split with a chisel and mallet.

Our simple oak and glass tier table project on page 29 uses the quartered turning special technique to create a contemporary looking piece. The procedure and dimensions given here are designed for the table, but can easily be adapted to a wide variety of woodworking projects. The same principle can also be applied to half turnings. While we have used the technique on contemporary pieces to make legs and stretchers, classic and period pieces often employ fluted quartered and half turnings as decorative details. They most commonly appear on casework, clocks and chests. We also used quartered turnings for a combination game and coffee table in our July/August 1985 issue.

Start by cutting four equal rectangles as shown in Fig. 1. When fit together they will be slightly larger and longer than the finished turning. The extra length will allow room for the pieces to shift slightly during glue up.

When cutting pieces the rule is — be precise. For the system to work, the four sections must have exactly the same cross section.

Next, cut four strips of brown kraft paper slightly longer than the sections and wide enough to wrap around two adjacent sides, with a little extra. Fold a lengthwise crease in each piece of brown paper. Heavy brown shopping bag paper will also work if you don't have kraft paper.

Before gluing, make a series of clamping blocks with a V-groove cut in the middle. The blocks, which are used as clamp pads, distribute pressure evenly onto each of the four sections. The V-grooves allow space for the protruding paper as shown in Fig. 2.

Next, wrap two edges of each piece, applying white or yellow glue to both the piece and the paper. When all four sections have been so treated, apply glue to the outside faces of the paper, and assemble the four sections. We recommend a plastic glue spreader to obtain even, fast coverage.

Now place the clamps, with the V-groove over the protruding paper, on the assembled sections and apply moderate pressure. The arrangement insures that the four sections are square and fit snugly together. The ends may not line up perfectly, but you'll trim them square later. We recommend four clamps on each side for the tier table. After the glue dries, remove the clamps and cut off the excess paper with a knife or glue scraper.

Square the ends with the table or band saw. Note that you may need to make two cuts to get all the way through the stock if the total thickness exceeds your saw's maximum depth of cut (Fig. 3). Draw an index line around the stock and cut carefully. For the other end, you'll have a true surface to work from, so you can use a stopblock clamped to your miter gauge.

Then, to find the centers — and make sure your four sections are identical — draw diagonal lines corner to corner on each end. If the center points don't fall on the junction of the four sections, the pieces aren't identical.

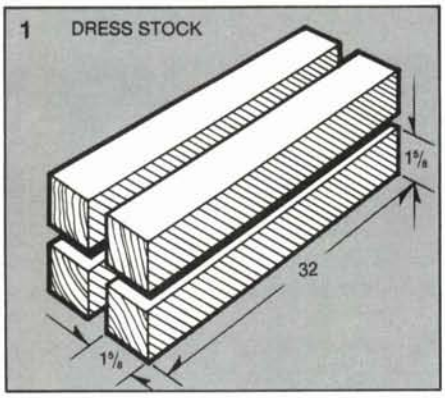
Next use a backsaw or a band saw to cut narrow kerfs along the lines on one end. Then drill shallow pilot holes, ⅛ in. in diameter, at the center of each end. The flutes of the spur center on the lathe's headstock spindle fit into the kerfs (Fig. 5). The dead center in the tailstock spindle fits into the end without the kerfs.

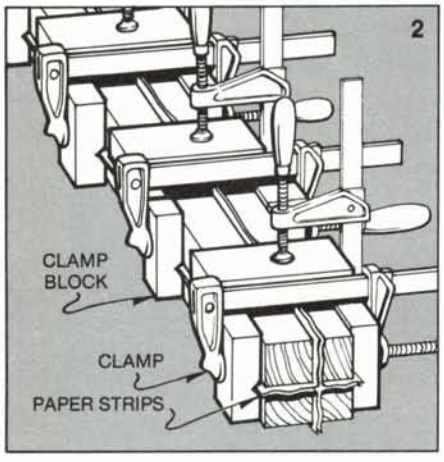
Don't eliminate the kerfs and try using the paper joints to mount the workpiece. The pressure will split it.

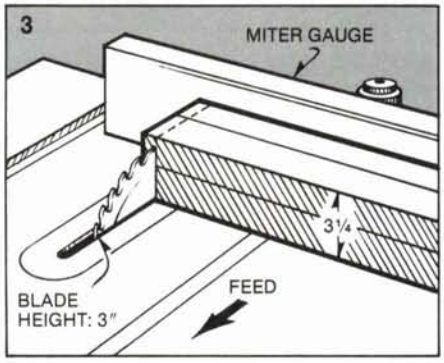
The next step depends on the size of your turning. If the four pieces together measure 2 in. or more across, as ours do, you'll need to remove the corners using the table saw with the blade set at 45 degrees, as shown in Fig. 4. With larger diameter turnings, small mass fluctuations exert more force, often leading to vibration. Cutting off the corners reduces the diameter of the initial spinning cylinder as well as the total mass. It also cuts down the amount of stock removed during turning, saving time.

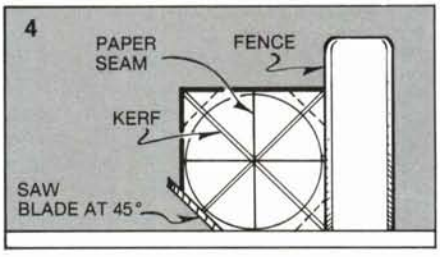
The "In The Shop" feature (page 16) on basic lathe setup explains the procedure for setting the kerfs, cutting the corners off large-diameter stock, as well as mounting it in the lathe (Fig. 5).

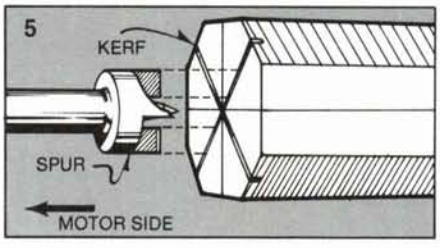
Now turn the cylinder using light passes with a gouge (Fig. 6). Stop the turning periodically to check the dimensions, shown in Fig. 6A. Once the cylinder is roughed out, smooth it

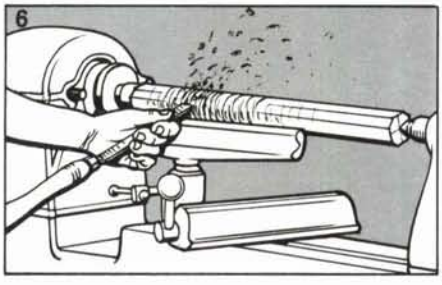


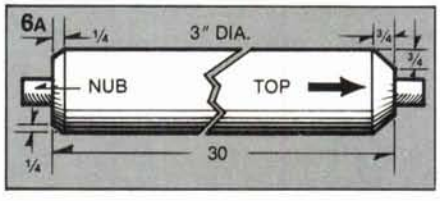


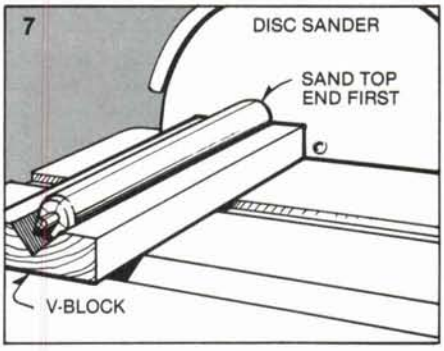


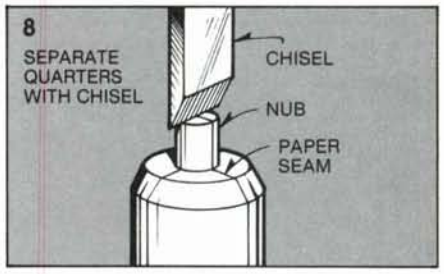


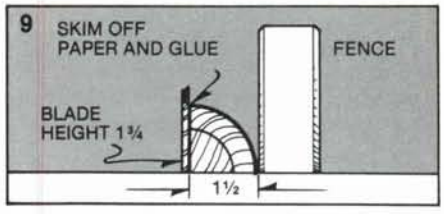












with light passes of the skew chisel, again feeding the tool slowly and keeping the skew edge parallel to the workpiece. The chisel will remove any grooves left by the gouge. Be careful to work slowly, using your eye — and a set of calipers — to insure a uniform diameter.

After turning the cylinder, mark the desired finished length onto the stock. Then, use a parting tool to cut the cylinder down to a nub on each end. The nub, generally about an inch, allows you to cut details into the end of the turning. It will also absorb any damage you inflict separating the quarters.

Our turning details consisted of a 45-degree bevel, ¼ in. wide on the bottom end and ¾ in. wide on the top (Fig. 6A). To establish the bevels, measure the specified dimension on both face and end grain. By connecting the face and end grain lines, you'll achieve a 45-degree angle.

Sand the workpiece with several grades of paper, up to 220. After removing the piece from centers, cut the nub off the top and sand it as shown in Fig. 7. That way the top end will be finish sanded, and the sections true, before the piece is split.

To split, use a chisel and mallet on the remaining nub end, as shown in Fig. 8. Any damage should be confined to the nub, which is later sawed off.

Most of the paper will come off by hand. Shave off the rest on the table saw, as shown in Fig. 9, or by hand if the workpiece is too small to pass safely over the blade. Because the bottom of a curved edge is against the fence, use extra care with this operation. Feed the workpiece slowly until halfway through, and then use a pushstick on the infeed side while using your hand to steady the outfeed side. Take out the saw blade marks with a light pass over a jointer.

As an alternate method of cleaning the glue from the legs, you can use a belt sander. Just be careful not to roll over the edges.

The piece was turned slightly oversized to allow for the clean-up operation.

Finally, sand the remaining rough ends, being careful to keep the legs the same length. WWJ

Lacquer

First developed by the Chinese about 3,200 years ago, lacquer was originally made from the sap of a tree (*Rhus verniciflua*) related to the common sumac. The application was time consuming, typically requiring over thirty coats, and it formed a black or red rather than a clear finish. The durable surface resisted penetration by water, alcohol and acid, and many of the oldest specimens found in tombs are thin films that outlasted the wood they covered.

The modern version, although a synthetic with much different properties than Oriental lacquer, is also a durable finish that protects wood from water, alcohol and acids. It dries to the touch in minutes, greatly reducing dust problems, and polishes to a fine close-to-the-wood luster.

Surprisingly, lacquer can exclude moisture as well as spar varnish; with three coats, both are 73 percent effective in shielding wood from extreme humidity, according to the U.S. Department of Agriculture Forest Products Laboratory. Polyurethane forms a tougher surface, but it also collects dust and leaves a thick film on top of the wood.

Most modern lacquers are made from nitrocellulose, a synthetic generally derived from cotton fibers treated with sulfuric and nitric acid. Although the nitrocellulose alone would form a brittle surface, oil additives give it flexibility and resins provide additional body, with these all dissolved in a solvent base.

Lacquer is ideal for mass production because it dries to the touch in minutes and can be recoated in about two hours. Moreover, each subsequent coat partially dissolves the underlying layer, creating a strong bond between coats. Like shellac, lacquer dries by evaporation so the solvent will dissolve even a well-cured finish. This feature makes it easy to repair blemishes in a lacquer finish, but also leaves it vulnerable to damage from nail polish and perfume, which often use the same solvents.

Because lacquer dries so fast, commercial furniture and cabinet makers spray it on. The equipment needed for spraying includes a properly designed spray booth as well as a compressor and spray gun. Because commercial spraying systems cost so much, we'll limit our discussion to the aerosol cans and brushing lacquer that can be found at most hardware stores.

Safety

The chemistry of lacquer, however, presents woodworkers with hazards. Nitrocellulose is extremely flammable; in a slightly different form it's an explosive called guncotton. Moreover, nitrocellulose and its solvents are toxic as well as flammable. Because of these hazards, using lacquer requires plenty of ventilation and precautions to insure there aren't any open flames or sparks in the vicinity.

We strongly recommend working outdoors. If you must work inside, do so only in a room with adequate cross ventilation and a large exhaust fan in a window or door. Work within several feet of the fan, close enough so the suction removes the vapors immediately. Also wear a respirator and protect your skin with rubber gloves. Be sure to read and follow the directions on the label.

Spraying

Prepare the surface with careful sanding with several grades of paper, finishing with at least 220 grit. Vacuum and wipe off with a tack rag. Fill open-grained woods if desired.

The actual spraying operation is fairly simple. A few test runs on a piece of scrap will provide enough practice to get the right coverage. Too heavy a coat and the lacquer can sag; too light and it won't run together properly.

When spraying, stay 6 to 8 in. from the work and start the pass off to the side. Press the button when you get to the edge. Use uniform strokes, keeping the can the same distance from the piece. Don't make an arc as you spray; concentrate on moving evenly from side to side. Overlap the passes. Do the edges and difficult areas first, wide and flat areas last.

For the sealer coat, just spray on a thin coat of lacquer. Sand well with 220-grit paper.

The lacquer will dry to the touch in several minutes and can be recoated in about two hours. In a perfectly dust-free environment it wouldn't be necessary to sand between coats because lacquer dissolves part of the underlying finish, creating a good bond. In practice, dust particles always disturb the surface. If you don't sand, subsequent coats accentuate the blemish caused by the particle.

Brushing Lacquer

Brushing lacquer requires the same precautions as spraying. The solvents are extremely volatile so they disperse readily even when brushing.

Brushing also takes practice because the lacquer dries so fast. If you try to tip off the stroke you just finished, the brush will drag and leave a mark. Use a full brush and flow the lacquer on. Don't brush it in. Work fast, covering small sections with long strokes. Slightly lap the sides of the last stroke, but don't worry if you miss a spot. The subsequent coats flow into the underlying layers so missed spots will disappear after the second coat. Use at least three coats and level each layer with 220-grit paper. For the sealer coat, thin the lacquer about 50 percent.

With brushing lacquer, there are some special considerations you don't have to worry about with other types of finishes. The solvents in lacquers are designed for the particular mix of nitrocellulose and oils, so the thinner for one brand may well not work for another brand. Be sure not to mix brands.

The thinners are also so strong they can dissolve oil-based stains. It's best to use a water-based stain and let it dry thoroughly. Or use a compatible stain made by the lacquer manufacturer. The lacquer thinner may also dissolve the glue holding the bristles in the brush. Be sure to buy a brush with bristles set in rubber.

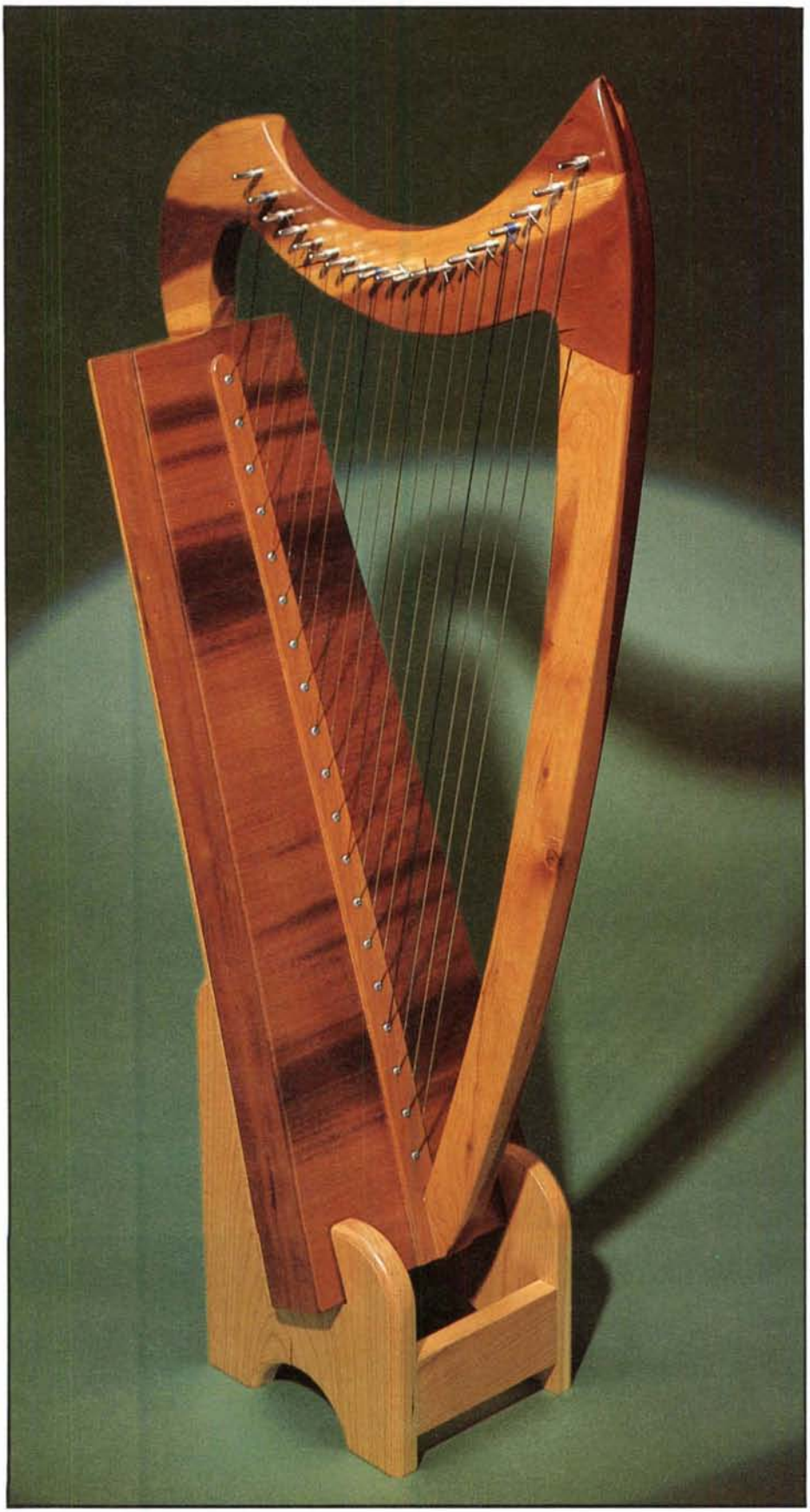
Both spray and brush lacquer are vulnerable to high humidity until dry. The moisture gets into the finish and makes it cloudy, called blushing. If you must work in humid weather, lacquer manufacturers sell blush retarders that can be added to the lacquer.

After the final coat of lacquer dries, it can be treated the same way as a varnish or shellac. Rub it with pumice and rottenstone in the traditional manner and apply a coat of wax, or just buff it to the desired gloss with 0000 steel wool. Lacquers are sold in gloss, semi-gloss, and matte finish.

WWJ

Folk Harp

by David Moretti



Musical instruments fashioned from wood have a long and rich history, but few are as deeply rooted in both history and literature as the harp. The folk harp we feature here is of Flemish origin, following a design that first became popular in Flanders, a region that includes several Belgian, Dutch and French provinces. Thousands of these harps were crafted by Flemish instrument makers during the 14th, 15th, and 16th centuries, and were carried throughout Europe by itinerant musicians. Our harp is crafted in nearly the same manner as its early forebears some 600 years ago, except for its plywood back, soundboard and nylon strings.

For music buffs, our folk harp has a 2½ octave diatonic range. Like most modern folk harps, it has nylon strings, which provide a tonal quality nearly identical to the catgut strings that were the standard before the development of nylon. To simplify making the harp, we have arranged with a supplier to offer a package including the 19 strings, tuning pins, grommets, and a tuning pin wrench — all the hardware needed to construct and tune one harp. The same supplier has agreed to offer a music book and tape, both titled "Teach Yourself To Play The Folk Harp," by noted musical author Sylvia Woods.

Our harp is constructed of solid cherry and cherry plywood. Because only a very small amount of plywood is required and lumberyards often sell only by the whole or half sheet, our hardware supplier will also offer the back and soundboard precut to slightly oversize. Ordering information and prices for the parts kit, plywood parts, book and tape are provided in the Bill of Materials.

Begin construction by getting out stock for the neck (A) and forepillar (B). As shown in Step 1, you will need a 1 in. by 8 in. by 20 in. board for the neck, and a 1 in. by 6½ in. by 38 in. board for the forepillar. Try to select good clear-grained stock for these parts, free of any knots, checks, or other visible defects. Now make a template of the neck and forepillar, using the grid pattern layout as a guide. The template could be made of either matte board or ⅛ in. hardboard. If you plan to make more than one harp or store the template for future use, hard-

board would be the best choice. Mark the tuning pin locations on the template, and drill a ⅛ in. hole at each point.

We've worked out a four-step process for making the neck and forepillar assembly. Using the template as a guide (Step 1), lay out the profiles of the neck and forepillar. Then use the band saw to rough out the shapes. The router table, with a large diameter straight cutter, is used to establish the ½ in. half-lap depth. Readjust the bit height several times and cut within about ¼ in. of the shoulder line. Next, using a simple block fence as a guide, square up the shoulder line (Step 2). The rough cut ends are then squared to the line using a disc sander, as illustrated in Step 3. After both the neck and forepillar corresponding half-laps have been cut, the two parts are test-fitted, adjusted as needed, and then glued and clamped between clamp blocks, as shown in Step 4. Finally, using the template as a guide once more, mark the tuning pin holes on the completed assembly.

After drilling the 3/16 in. diameter by

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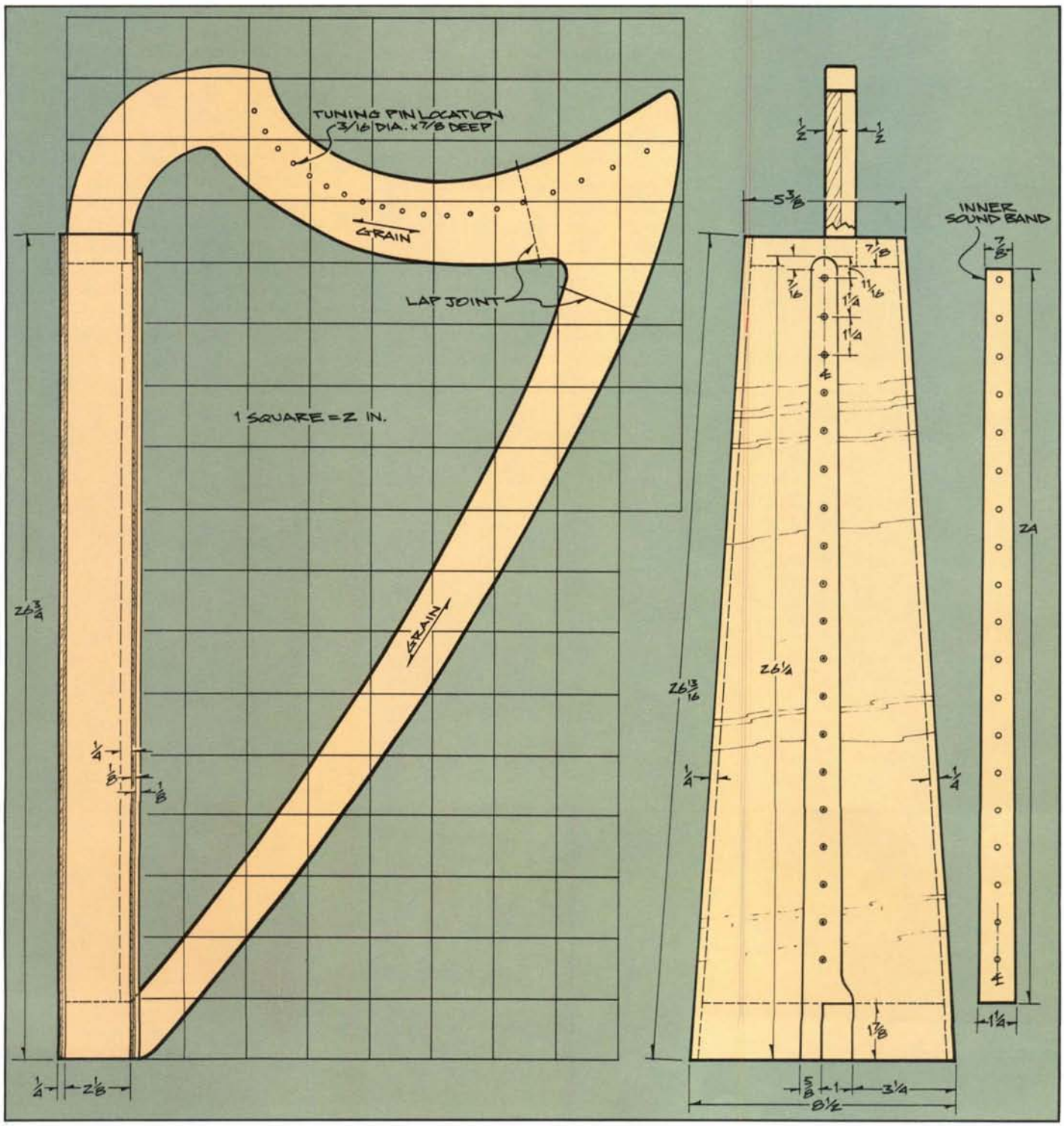


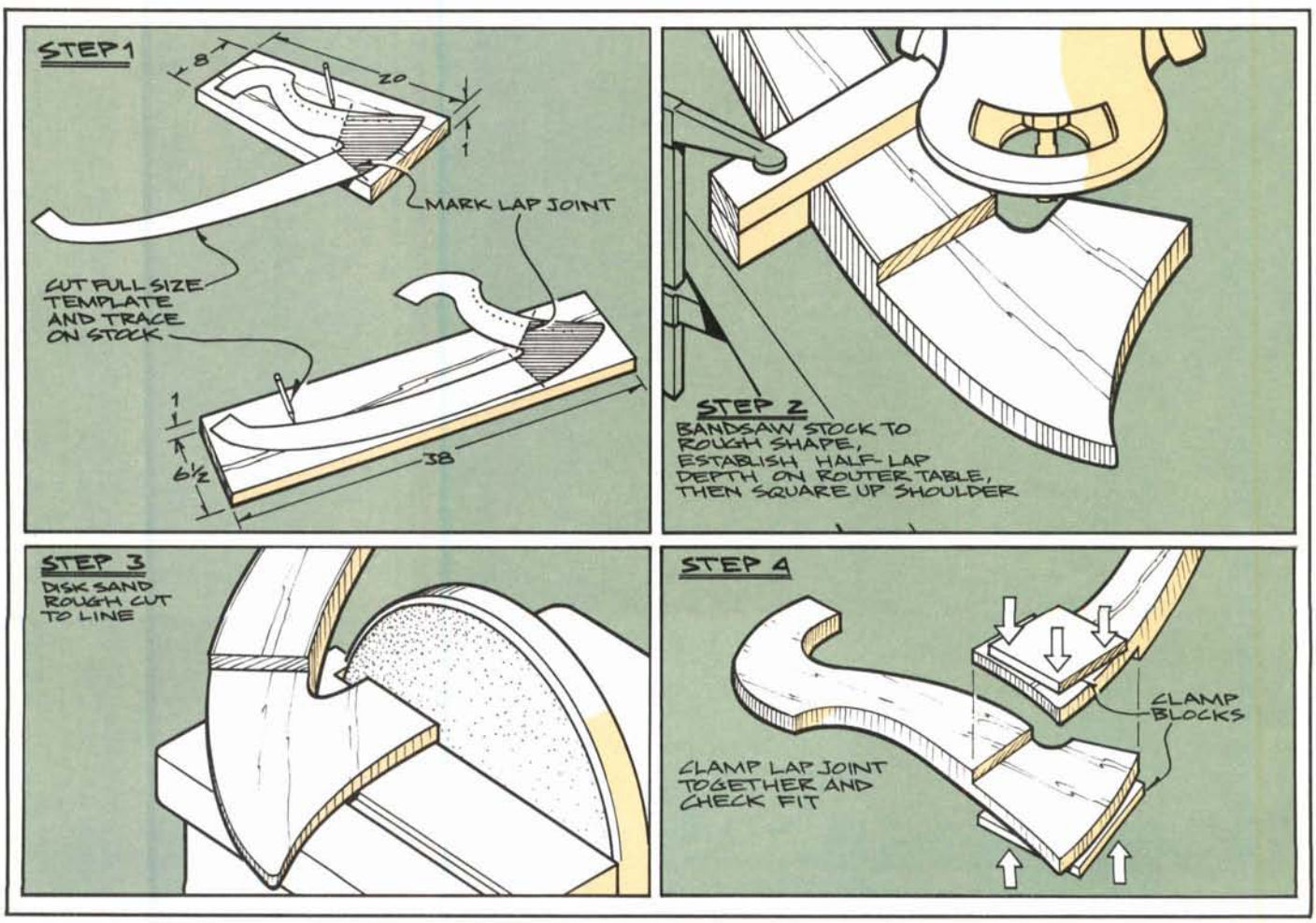
Folk Harp continued

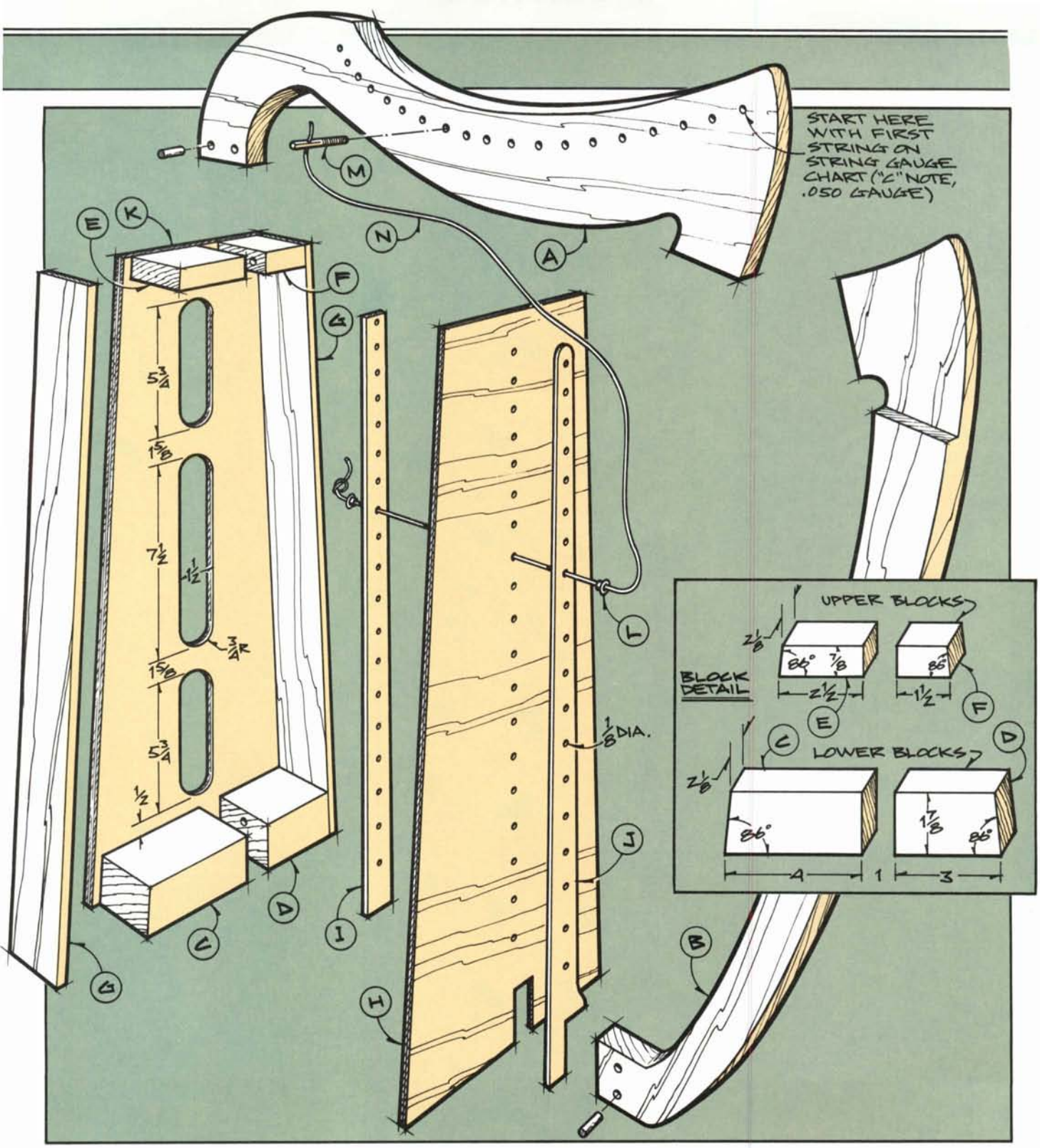
⅞ in. deep tuning pin holes, use a rasp and sandpaper to final shape and sand the neck and forepillar assembly.

The sound box is made to fit the forepillar and neck assembly. Start by cutting the upper and lower end blocks to size. The outside ends of the two lower blocks (C, D) and the two upper blocks (E, F) will be cut at a matching 86-degree angle. Refer to the end block illustration for an exact guide to the dimensions of these critical parts. Remember, it is vital that these blocks be cut and positioned accurately, since the sound box will be built around them. Drill dowel holes through the ends of the neck and forepillar and into the various end blocks, and then glue the end blocks in place. As you will note, the neck and forepillar assembly is offset 1 in. to the right by virtue of the length of the end blocks. This offset is needed to position the strings perpendicular to the sound box. Because the positioning of the upper and lower blocks is so important to the construction of the rest of the sound box, their location should be accurate. Use a straight edge to insure that both upper and lower blocks are in the same plane, front and side. If your neck and forepillar assembly is different from ours, the 86-degree angle on the outside plane of the blocks will have to be adjusted accordingly.

Before you go any further, the remaining sound box parts should be rough-cut to length and width. The soundboard (H), with the stringbands, (I, J) should be complete, as should the sides (G) and the back (K). Cut the soundboard, sides and back slightly oversize in width and length, since these parts are trimmed flush later on in the assembly process. Note that the dimensions provided for the soundboard, sides, and back in the Bill of Materials were the final dimensions on our harp. Your actual final dimensions will probably differ slightly, as determined by the point-to-point distance from the neck to the forepillar.

After the soundboard has been cut to rough size, the front and back





stringbands can be cut and glued in place along the center line of the soundboard. Then drill the ⅛ in. diameter grommet holes and insert the grommets (L) as indicated, exactly along the previously established center line. The grommets will press fit into place — no glue is required. *Note:* If you can't get them locally, the ⅛ in. thick cherry for the outer stringband, and the ¼ in. thick cherry for the sides and inner stringband can be ordered from Craftsman Wood Service Company, 1735 West Cortland Court, Addison, IL 60101.

Now glue the sides to the end blocks, filing and sanding as needed to flush these parts. Next, add the soundboard. Start by notching the soundboard/stringband to fit around the forepillar. Glue the soundboard in place, and then file and sand it flush with the sides and end blocks. Finally, add the back which, like the soundboard, is glued in place and then filed and sanded flush with the sides and end blocks. The oblong holes in the back (which must be cut before the back is mounted) are needed to access the strings, so they can be mounted.

After final sanding, the harp is finished with either a penetrating oil or

(continued on next page)

a lacquer. If you opt for a lacquer finish, refer to our Finishing feature (page 23) for some tips on applying lacquer.

To string the harp, insert the free end of the strings (N) through the soundboard, up to the appropriate tuning pin (M), and through the pin hole. The tuning pins are screwed in about ¾ in., and then backed out four or five turns before the strings are inserted, so the strings will be tensioned as the tuning pins are tightened.

While it is not possible to go into stringing and tuning the folk harp, we have provided you with a stringing chart to insure that the strings are correctly positioned. The strings will come in four gauges: .050, .040, .032 and .028. The stringing chart shows the correct mounting order, starting with the longest string. As you will also note from the string chart, C strings are red, F strings are blue, and all others are clear. This layout is standard for harps, and serves mainly as a visual guide to facilitate finger positioning, making it easier to play the instrument.

To further simplify stringing the harp, our supplier has agreed to pre-cut all the strings to the appropriate length, and to pre-tie a "harp knot" on one end. You need only insert the strings and tighten them.

Once you have finished your harp, the next step is to make a proper stand to support it. The stand we show is simply two sides, notched to fit the harp, and joined by three stretchers.

Editor's Note: Our sincere thanks to Mr. Harold Westover of Westover Workshops. In addition to agreeing to provide readers with a source for difficult to find parts, Mr. Westover has served as a consultant to us on this project. As both an author and harp builder, Mr. Westover is widely recognized as an expert in his field. He notes that the folk harp, of which he has built approximately 700 to date, retails for about $400 and is easily the most popular harp his firm produces.

WWJ

String Gauge Chart

	NOTE	GAUGE	COLOR
BOTTOM OCTAVE	C	.050	Red
	D	.050	Clear
	E	.050	Clear
	F	.050	Blue
	G	.040	Clear
	A	.040	Clear
	B	.040	Clear
	C	.040	Red
SECOND OCTAVE	D	.032	Clear
	E	.032	Clear
	F	.032	Blue
	G	.032	Clear
	A	.032	Clear
	B	.032	Clear
	C	.032	Red
HALF OCTAVE	D	.028	Clear
	E	.028	Clear
	F	.028	Blue
	G	.028	Clear

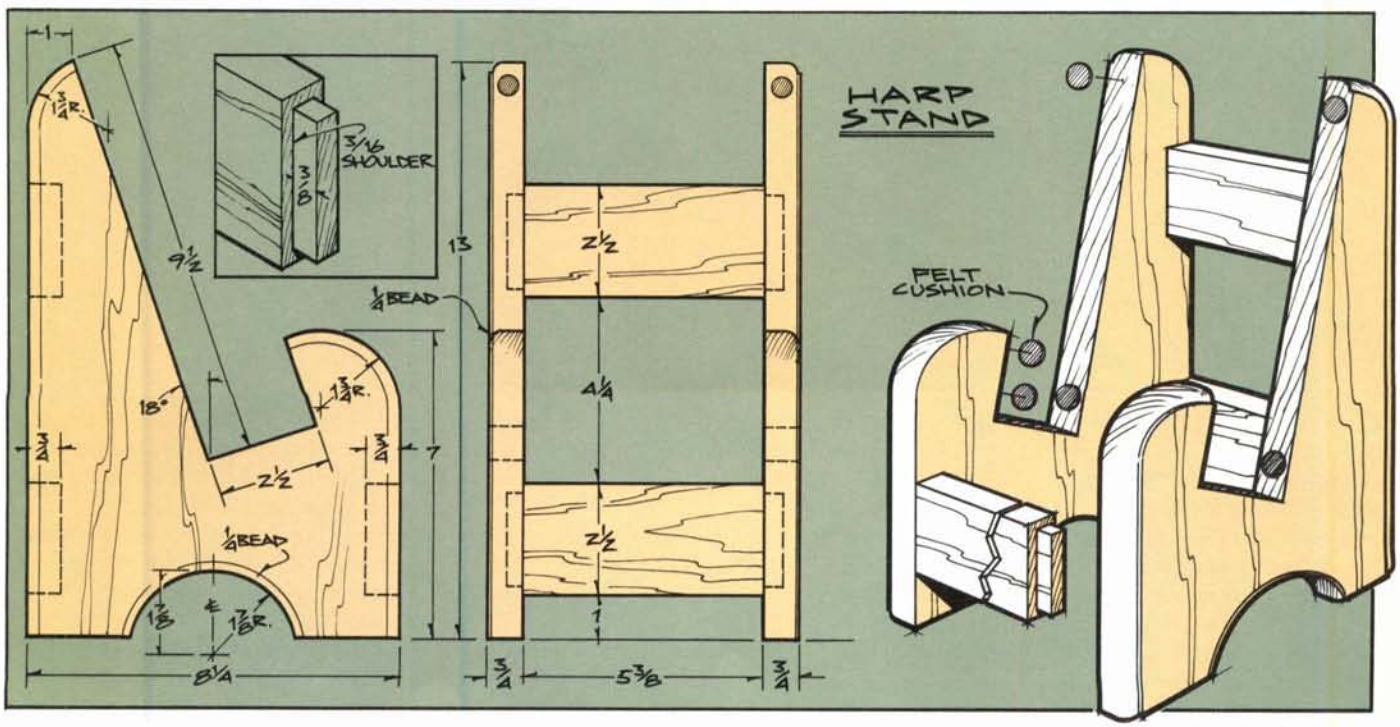
Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Neck	make as shown	1
B	Forepillar	make as shown	1
C	Lower End Block (left)	1⅞ × 2⅛ × 4	1
D	Lower End Block (right)	1⅞ × 2⅛ × 3	1
E	Upper End Block (left)	⅞ × 2⅛ × 2½	1
F	Upper End Block (right)	⅞ × 2⅛ × 1½	1
G	Side	¼ × 2⅛ × 26 13/16	2
H	Soundboard	⅛ × 8½ × 26¾*	1
I	Stringband (inner)	¼ × 1¼ × 24	1
J	Stringband (front)	⅛ × 1⅝ × 26¼	1
K	Back	¼ × 8½ × 26¾*	1
L	Grommet**	as shown	38
M	Tuning Pin**	as shown	19
N	String**	as shown	19

*Available from: Westover Workshops, Box 304, Walpole, NH 03608; (603) 756-3670. Order part no. 8A for the soundboard (cost $2.00) and part no. 8B for the back (cost $2.00).

**The grommets, tuning pins, strings, and a tuning pin wrench are provided in a single kit available from Westover Workshops, (see address above). Order part no. 7, cost per kit is $17.

Sylvia Woods' "Teach Yourself To Play The Folk Harp" book (order part no. 9; cost $7.60), and "Teach Yourself To Play The Folk Harp" audio tape (order part no. 10, cost $4.25), are also available from Westover Workshops.



Oak and Glass Tier Table

Our tier table uses the simplicity of contemporary design to create an attractive addition to a den or study. You can adorn it with your favorite collectibles or use it for an end table.

The quartered turning special technique described on page 20 forms all four legs (A) in a single lathe turning. We also developed a jig to simplify cutting the stretcher mortises and drilling the holes for the adjustable pegs (C).

The four stretchers (B) are identical, with tenons cut on each end. They are joined with half-lap joints.

We used red oak for the legs and stretchers. A glass shop will cut the shelves (D) to size.

Start by making the four legs as described in the Special Technique instructions. Then cut the flat inside edge with the band saw set at 45 degrees as shown in Fig. 1. Clean up the cut with a belt sander or stationary disc sander.

Then make our drilling jig, which mounts on the drill press as shown in Fig. 2. The jig is needed because the outsides of the legs are rounded, making it difficult to cut holes and mortises perpendicular to the inside edge.

Our solution was to place a straightedge across a V-block. The straightedge (a piece of hardwood) rests on the inside edge of the leg as shown in Fig. 3. If the straightedge is parallel to the drill-press table, it will be perpendicular to the drill bit. The device allows you to keep the mortise cuts square to the leg by making each end of the straightedge the same distance from the drill-press table. Just turn the screws in or out until you achieve the right distance.

Before drilling the holes, measure carefully to find each leg's center line.

Then, with each leg secured in the jig, bore the three $\frac{3}{8}$ in. diameter by $\frac{3}{4}$ in. deep holes for the mortise (Fig. 4). Also bore the holes for the adjustable pegs using the jig. We recommend a Forstner or brad-point bit, which won't "walk" as you start to drill. Slide the leg through the jig as needed to cut the various holes.

After finishing the drilling operations, use the V-block for support while cleaning up the mortises with a chisel and mallet.

Next, cut $\frac{3}{4}$ in. by $1\frac{1}{2}$ in. wide stock to the final stretcher length of $20\frac{3}{4}$ in.

Accurate sizing of the tenons is crucial for a tight fit and clean look. The edges of the shoulder fit against the inside of the legs, so they'll show. Use the table saw to establish the $\frac{3}{16}$ in. shoulder depth for the tenons. The miter gauge and stopblock will insure that all 32 cuts are uniform. But make test cuts on a piece of scrap first to test your setup. Cut the workpieces carefully and rotate the top edges toward you for successive cuts. Any tearing will then be on the edge cut first. For the last cut, hold or clamp a piece of scrap behind the workpiece to help prevent chip out. Using a good crosscut blade also helps here.

To remove the rest of the material, run the workpiece over the saw blade on end. Using a tenoning jig makes the procedure easier and safer. Set the blade to fall just under the finished shoulder. At first set the rip fence or jig for a tenon slightly thicker than your already cut finished shoulder. Use a

(continued on next page)

piece of ¾ in. scrap for test cuts, inching the tenoning jig in until you get a snug fit in the mortise. When you cut the workpieces, rotate them end over end for successive cuts. Then when you adjust the jig to make the cuts on the opposite shoulder, remove just enough wood for a test fit before making the final cut.

Keeping the same side of the workpiece against the jig or rip fence for all the tenon cuts insures that all the tenons will be identical.

Cut the ¾ in. by ¾ in. half-lap joint in the stretchers with a dado head in the table saw. Back the stretcher up with a scrap block to prevent the wood from tearing at the end of the cut. Cutting a test joint with scrap the same size as the workpiece insures a snug fit.

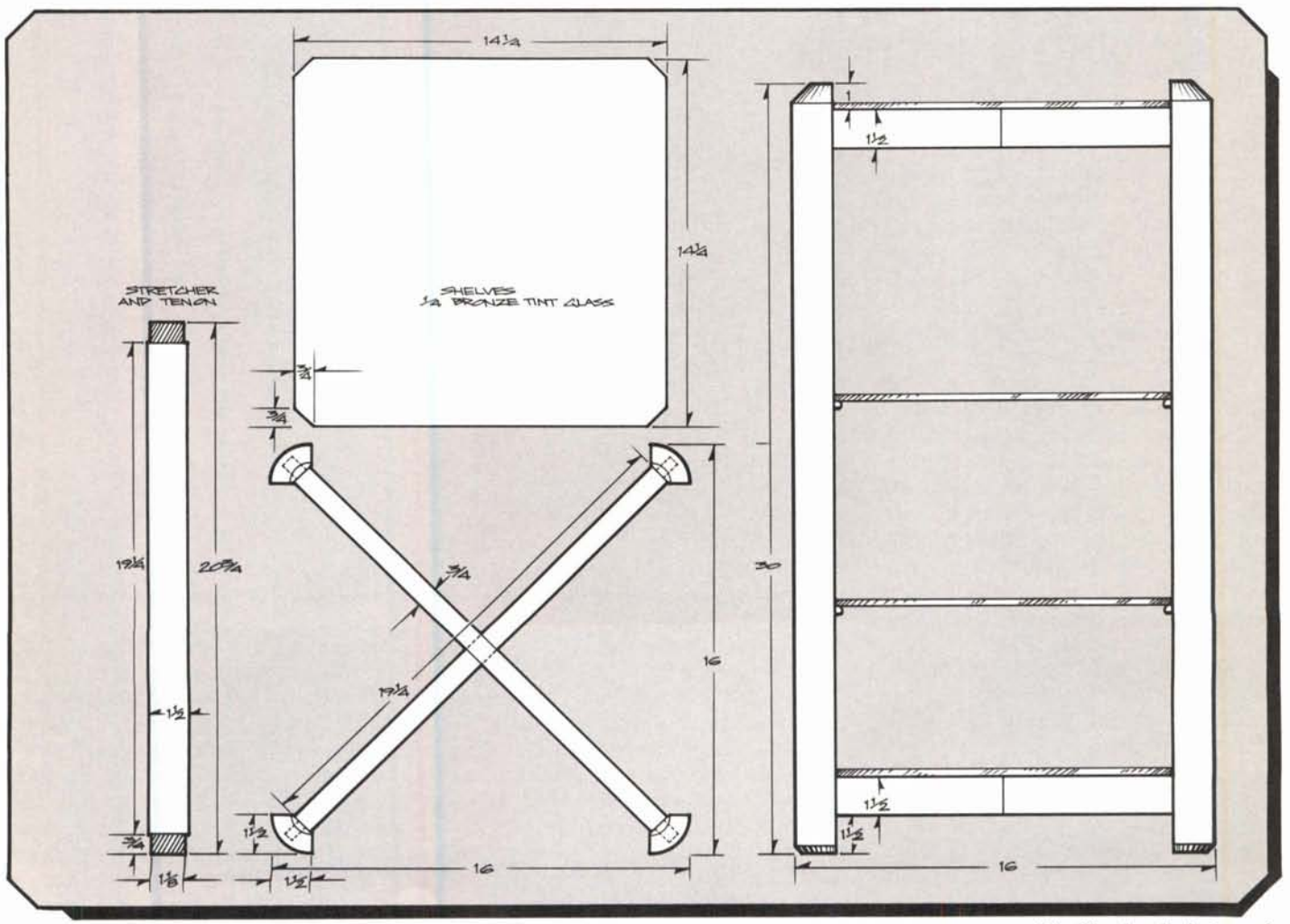
Fasten the stretchers together with a 1 in. long number 8 screw. Drill both a shank and a pilot hole, set the screw about ¼ in. deep and use an oak plug to fill the hole. Let the plug protrude a little, and sand it flush after the glue dries.

Finish sand the pieces before assembly. Then fit them together without glue to make sure the joints are all snug. When applying the glue, use it liberally inside the mortise, but sparingly on the tenon. Pushing the tenon into the joint will squeeze glue toward the shoulder so you don't need a lot near the outside of the joint. In any case, using glue sparingly toward the shoulder will minimize glue squeeze-out. If some glue does escape the joint, clean it off with a rag dampened with warm water. Apply pressure overnight with two band clamps as shown in Fig. 5. Finish with clear penetrating oil or lacquer.

Finally, place the 2 in. dowels at the heights you choose and set in the glass shelves. Any glass shop will cut the pieces to size and polish the edges. For a mirror-smooth finish, specify a factory-polished edge. It will cost more and take longer, however, as the shop will have to send the work out. WWJ

Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Leg	30 in. long as shown	4
B	Stretcher	¾ × 1½ × 20¾	4
C	Dowel	⅜ × 2	8
D	Glass Shelf (bronze tint)	¼ × 14¼ × 14¼	4



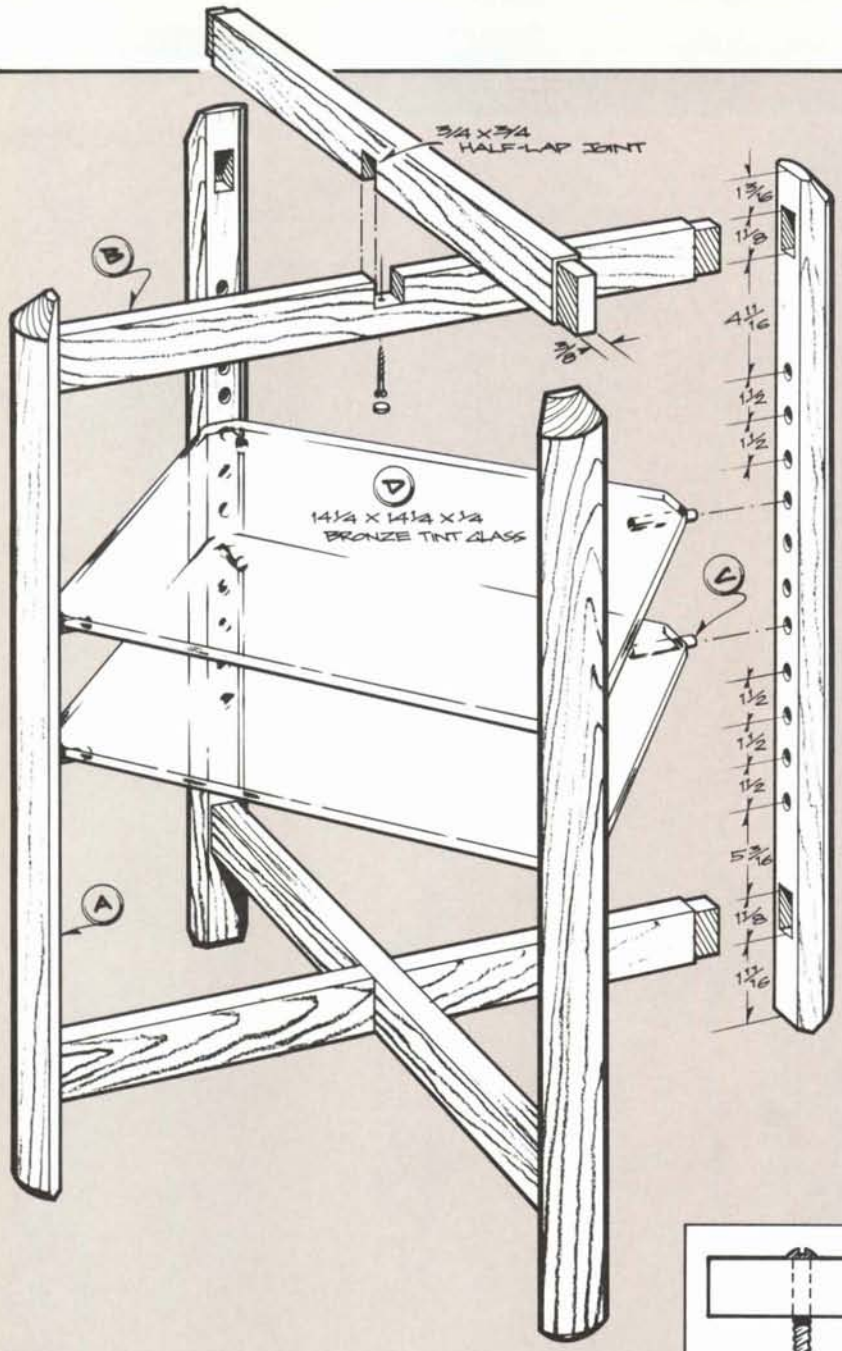
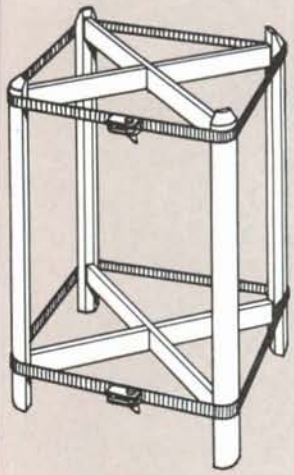
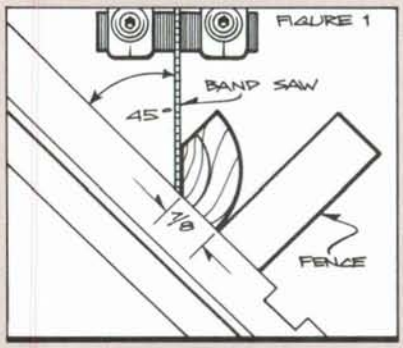
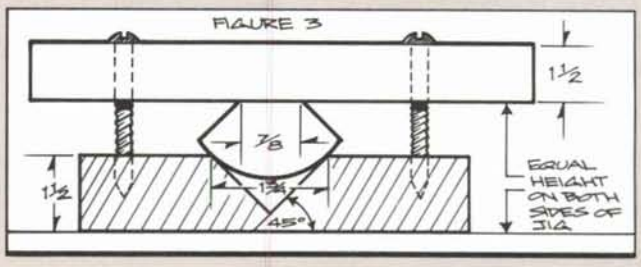
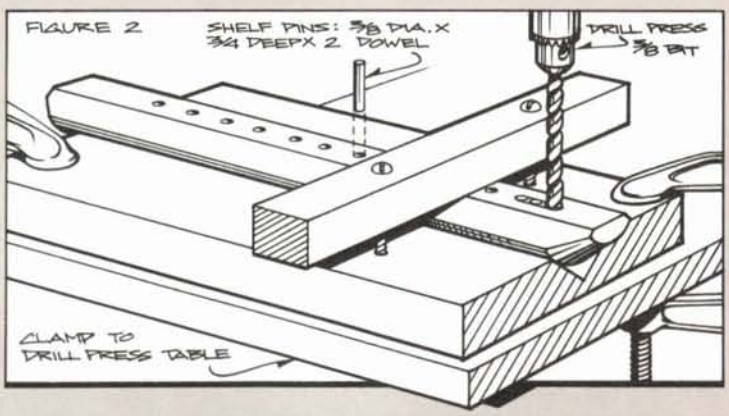


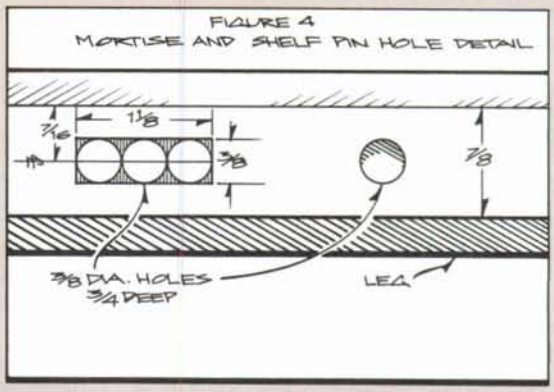
FIGURE 5
BAND CLAMP ASSEMBLY



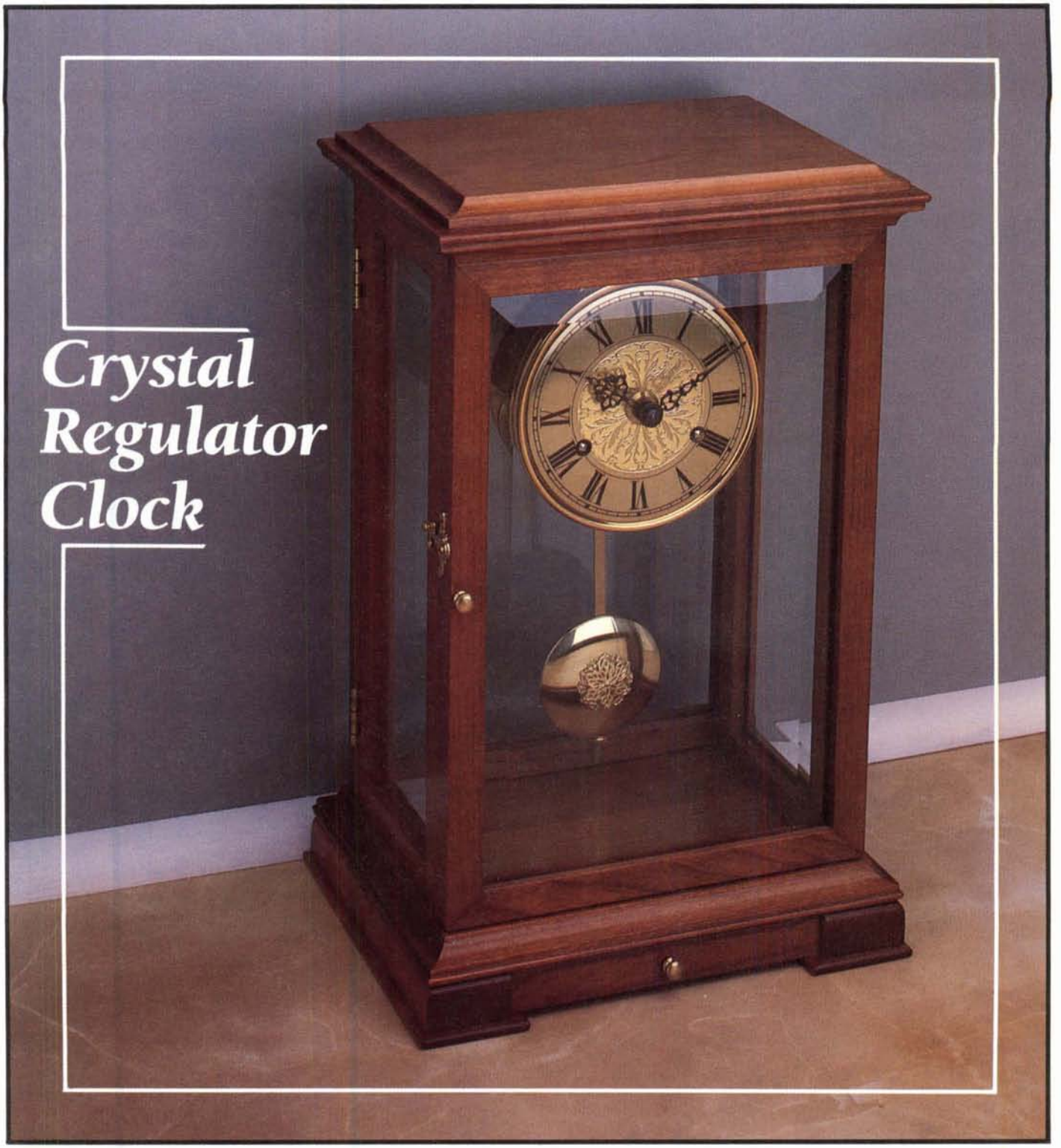








Crystal Regulator Clock



The Mason & Sullivan clock company tells us that this crystal regulator (they call it an Orleans Regulator) is one of their best selling new designs. The clock shown is crafted in cherry, but we think it would also look good in walnut, mahogany, or perhaps a figured maple.

We have arranged for the Mason & Sullivan company to offer our readers a single component kit that will include all the hardware, the movement, and the beveled glass needed to construct one clock. The cost of the kit is $159 (see Bill of Materials for ordering information). We often call out alternate movements (usually battery-driven quartz) for readers who might want to reduce costs, but the brass West German movement is an important visual element. We don't recommend substituting.

You will need various stock thicknesses for the parts, including 3/16 in., 1/4 in., 3/8 in., 1/2 in., and 3/4 in. Fortunately, though, all the parts are fairly small, so if you have 3/4 in. stock, it can be resawed and then hand planed or jointed to final thickness.

As shown in the exploded view, the door frames feature a mitered spline construction, while the side frames are slip-joined. We have illustrated the side frames with the slip-joint to hold the construction as closely as possible to Mason & Sullivan's design. You

may choose to miter and spline the sides, using the same technique as for the doors, to simplify construction. We should also point out that the case, without the clock, could be used to display a small sculpture or a collection of miniatures. The beveled glass may be ordered separately or you may substitute flat glass.

However you intend to use this piece, the glass should be ordered before you start to insure that it will fit properly.

Begin construction with the top/bottom (A), and cap (B). After cutting these parts to length and width, use a $\frac{3}{8}$ in. bearing-guided cove cutter to establish the coves as shown on parts A and B (see details). Note that a $\frac{1}{2}$ in. diameter straight cutter is then used to establish the $\frac{1}{8}$ in. step all around parts A. Also at this time cut the base (E), foot (F), and key drawer (G) parts to size, rounding the edges of these parts as shown.

Both the frame stiles and rails (parts C and D) and the door stiles and rails (H and I) are made from $\frac{1}{2}$ in. square stock. If you opt to make the side frames using the same mitered spline technique as for the doors, the cutting and assembly procedures for the frames will be identical. Start with the $\frac{1}{2}$ in. square stock, then use either the router table or the table saw to establish the $\frac{1}{4}$ in. square rabbet that will accommodate the glass and retainer molding (J). Next, miter the ends to establish the various rails and stiles, and glue the frames up, making certain that they are perfectly square. A frame clamp comes in handy here if you have one.

Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Top/Bottom	$\frac{1}{2} \times 6 \times 8$	2
B	Cap	$\frac{3}{8} \times 5\frac{1}{2} \times 7\frac{1}{2}$	1
C	Frame Stile	$\frac{1}{2} \times \frac{1}{2} \times 10\frac{1}{2}$	4
D	Frame Rail	$\frac{1}{2} \times \frac{1}{2} \times 4$*	4
E	Base	$\frac{3}{4} \times 1\frac{3}{8} \times 6$	2
F	Foot	$\frac{1}{4} \times 1\frac{3}{4} \times 6\frac{3}{8}$	2
G	Key Drawer	$\frac{3}{4} \times 5 \times 5\frac{1}{4}$	1
H	Door Stile	$\frac{1}{2} \times \frac{1}{2} \times 10\frac{1}{2}$	4
I	Door Rail	$\frac{1}{2} \times \frac{1}{2} \times 7$	4
J	Retainer	$\frac{3}{16} \times \frac{3}{16}$ stock	10 ft.
K	Mount Block	$\frac{3}{8} \times 1\frac{1}{2} \times 3$	1
L	Door Glass**	$\frac{3}{16} \times 6\frac{5}{16} \times 9\frac{13}{16}$	2
M	Side Glass**	$\frac{3}{16} \times 3\frac{1}{4} \times 9\frac{13}{16}$	2
N	Hinge**	$\frac{3}{4} \times 1$	2 pr.
O	Catch**	as shown	2
P	Knob**	$\frac{5}{16}$ in. dia.	3
Q	Movement**	Bim-Bam	1
R	Hands**	incl. w/movement	1 pr.
S	Key**	incl. w/movement	1

*Length includes tenons.

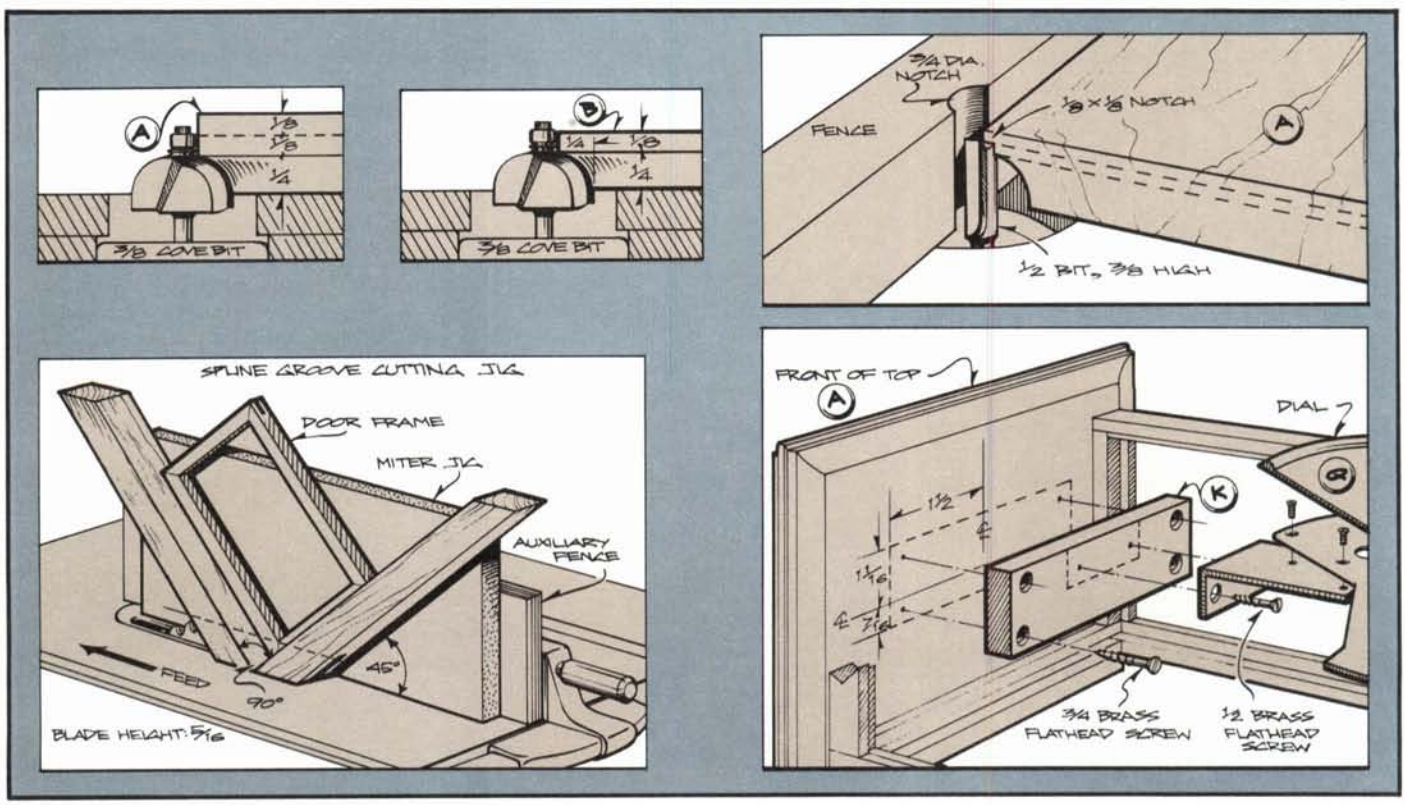
**Hardware, glass and movement included in kit available from: Mason & Sullivan, Dept. 3999, 586 Higgins Crowell Rd., West Yarmouth, Cape Cod, MA 02673. Order part no. CO539X, cost is $159 plus $5 shipping.

Once the frames have dried, the spline grooves are cut into the frame corners. As shown in the spline groove cutting jig illustration, you will need to construct a simple fixture for use on the table saw to cut the spline grooves. Our fixture is nothing more than two pieces of 2 in. square stock screwed to a particleboard base. The pieces must form a perfect 90-degree angle and be positioned at 45 degrees to the lower edge of the base. This fixture then bears off an auxiliary fence, and the table saw blade set at $\frac{5}{16}$ in. height is used to establish the spline groove. Be sure that the workpiece is clamped securely in the jig, and maintain control as you make each cut. Rotate the workpiece and repeat the procedure until all four corners have had the spline groove cut. When cutting the splines, note that their grain should be perpendicular to the miter joint for maximum strength. We usually make the splines slightly oversize, and then sand them off flush for the cleanest appearance.

If you opt to make the side frames using the slip joint, as shown, note that the glass rabbet on the stiles must be stopped $\frac{1}{4}$ in. from the ends.

The glass is mounted in the door and side frames, and held in place with a $\frac{3}{16}$ in. square retainer. We secure the retainer with $\frac{3}{8}$ in. long brass brads. It's a

(continued on next page)



good idea to pre-drill the retainer for the brads to avoid splitting it. Take extra care when setting the brads, lest you break the glass. A brad driver or setting tool, if available, is a great help here. Otherwise, we recommend holding the brads with a needle-nose pliers until they have been set.

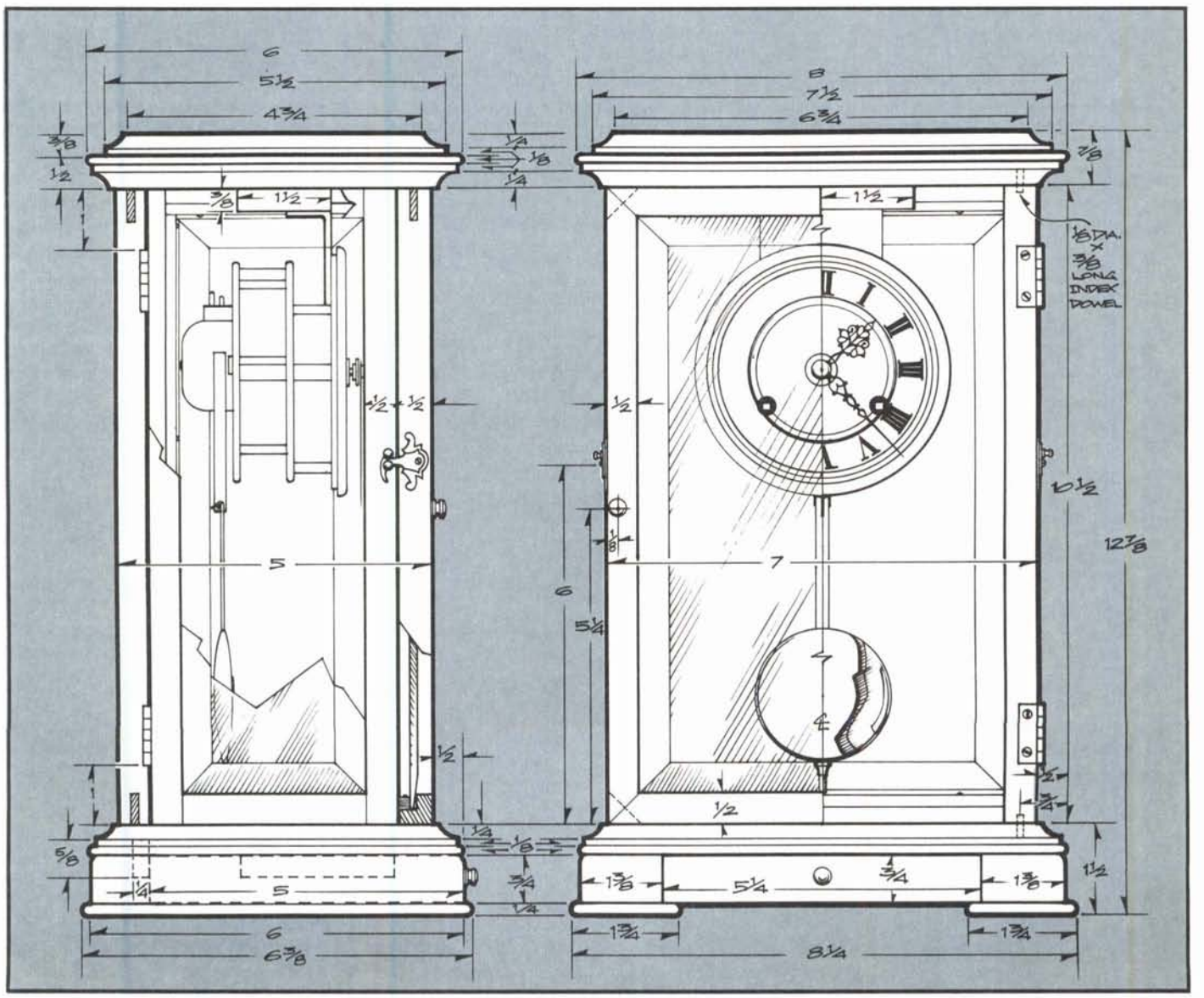
The clock case is assembled as follows. Mount the upper part A to part B using glue and screws. Then glue and clamp this upper assembly and lower part A to the two side frames. The ⅛ in. diameter by ⅜ in. long indexing dowels serve only as an aid in the glue-up and provide no additional strength. Now glue and screw the base and foot parts (E and F) in place. All screws used in the case assembly must be countersunk.

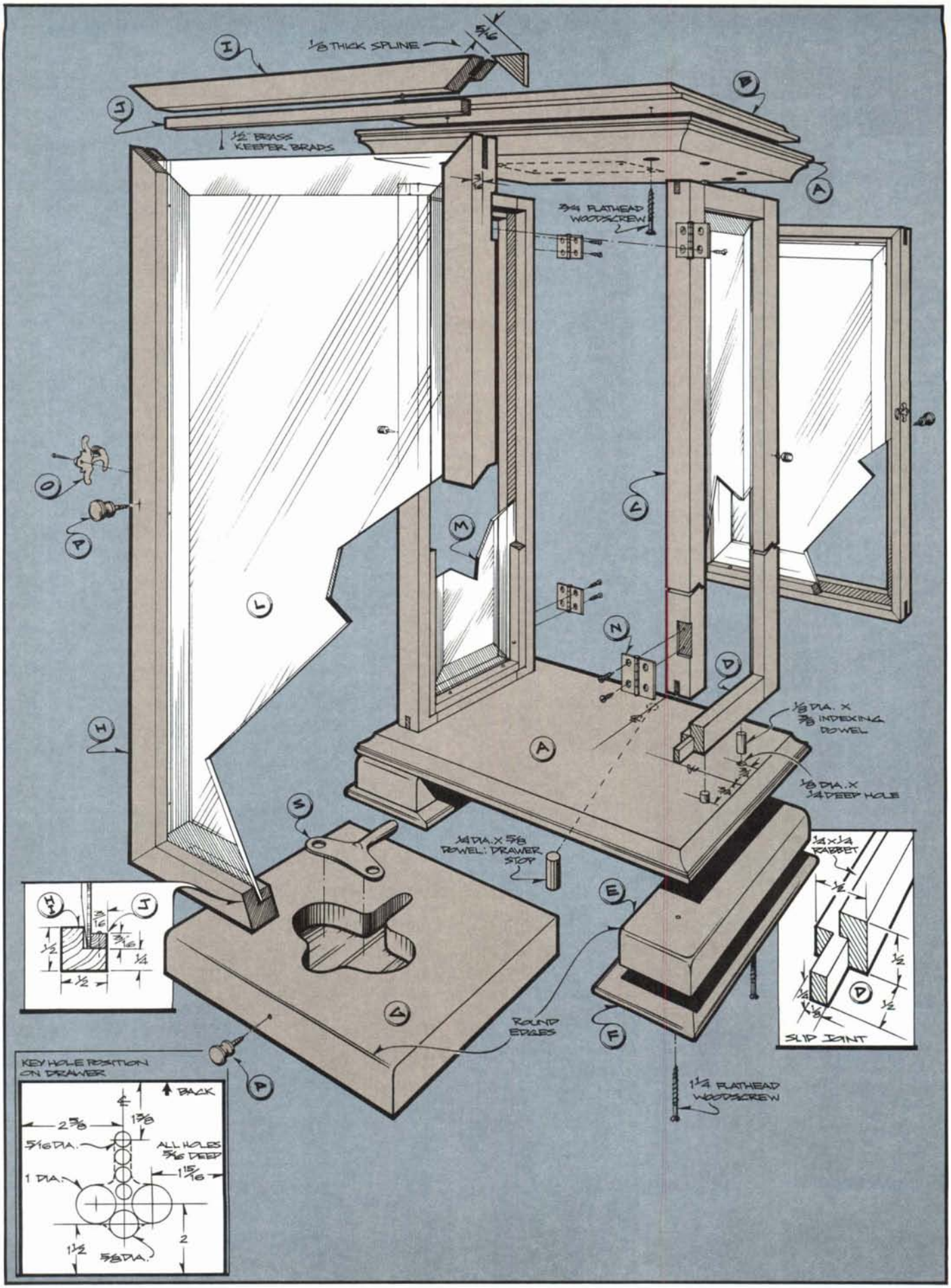
The small key drawer (G) is bored as shown to accept the clock key. As indicated in the detail, various size drill (and/or) Forstner bits are used to establish the basic profile, with the French fit shape then cleaned up by hand with a chisel. If you intend to use the cabinet as a display case rather than a clock, use the router to rout a square recess into the drawer instead. Note that a dowel inserted into the bottom of part A serves as a drawer stop. The drawer rides on the feet, which serve as drawer guides.

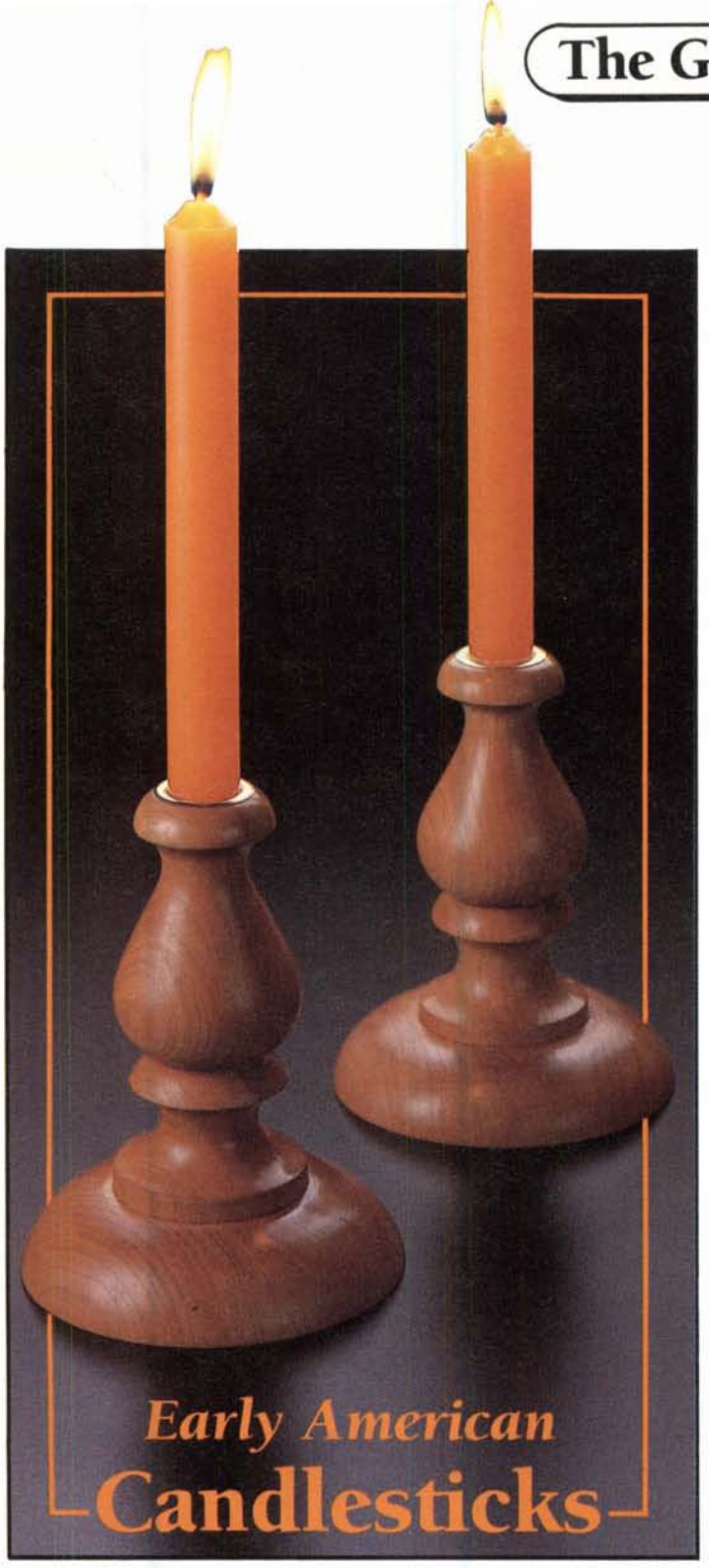
It's a good idea to mount the front and back doors, mortising for the hinges and temporarily fitting them and the hardware before you mount the clock movement. As shown in the detail, the movement itself mounts to a block (K) screwed into the bottom surface of the top (A). Unless you have a right-angle screwdriver, you will need to remove the solid brass mounting bracket on the top of the movement to access the screws that mount the bracket to the wood mounting block. To reach the screws that hold this bracket to the movement, remove the clock face. Note that the brass mounting bracket sets flush with the front edge of the wood mounting block.

We recommend either a penetrating oil or a lacquer finish for this piece. If you opt for lacquer, use one of the aerosol spray lacquers such as Deft. Given the small size of this piece, a single spray can should do the trick. Of course, the side and door frames should be finished before the beveled glass and hardware are mounted and the piece is assembled. Just take care not to get the finish on any surfaces that will be glued.

If you prefer penetrating oil, you might like to try tung oil for a change. Tung oil is considered the king of penetrating oil finishes, and in a piece such as the clock, it provides a slightly greater gloss and luster to the wood than the traditional penetrating oil mixtures. WWJ




1/8 THICK SPLINE
5/16
1/2" BRASS KEEPER BRADS
3/4 FLATHEAD WOODSCREW
1/8 DIA. X 3/8 INDEXING DOWEL
1/8 DIA. X 1/4 DEEP HOLE
1/4 DIA. X 5/8 DOWEL: DRAWER STOP
1/4 X 1/4 RABBET
SLIP JOINT
ROUND EDGES
1 1/4 FLATHEAD WOODSCREW
KEY HOLE POSITION ON DRAWER
BACK
2 3/8
1 3/8
5/16 DIA.
ALL HOLES 5/16 DEEP
1 DIA.
1 15/16
1 1/2
5/8 DIA.
2



Add an elegant look to your dining table with this handsome pair of Early American style candlesticks. We made ours from cherry, but mahogany and walnut are also good choices.

You'll need to glue up a turning blank for each candlestick. A turning blank is made up of three pieces of stock, each piece measuring 1¾ in. thick by 5¼ in. wide by 7½ in. long. Face-glue the three pieces together, then clamp firmly.

Dress the glued-up stock to 5 in. square, then refer to the *"In The Shop" column* on page 16 for details on trimming the four corners to create an eight-sided (octagonal) blank. Also, the article explains how to mount the blank for faceplate turning. We used a 3 in. diameter faceplate and secured it to the blank with 1¼ in. long by no. 12 flathead wood screws.

Now that the faceplate is mounted to the lathe, you can position the tool rest for the initial turning cuts. In its proper position, the edge of the tool rest should be parallel to the blank and almost touching it. Also, it should be just above the center line of the blank. Before starting the lathe, make sure there is adequate clearance between the blank and the tool rest. You can check for this by hand-turning the blank at least one revolution.

Next, using a gouge, turn the blank into the shape of a cylinder. Keep in mind that the octagonal blank may not be perfectly balanced as it rotates, so it's important to do this initial turning with the lathe at its slowest speed. Once the blank has been shaped into a cylinder, the lathe speed is increased for the remaining operations. The increased speed results in faster and smoother cuts.

Now, reposition the tool rest so that it is parallel to the end of the blank. Its height should be adjusted so the cutting edge of your chisel is at the blank's center line. Lock the tool rest in place, then use the roundnose chisel to flatten and smooth the end of the stock.

The candlestick can now be turned as shown in Figs. 1 through 5. A summary of the procedure is as follows:

Figure 1: Return the tool rest to its original position (parallel to the length of the blank and slightly above the center line) and, with the tool rest locked in place, use a parting tool to establish the 6⅛ in. length shown. Make the parting tool cut about ⅜ in. wide by ⅜ in. deep.

Figure 2: Use the parting tool to make a cut establishing the 5 1/16 in. length and the 2⅜ in. diameter. Once the parting cut has been made, use the roundnose chisel to turn down the remainder of the cylinder to 2⅜ in. diameter.

Figure 3: With the skew chisel, round the end and base as shown.

Figures 4 and 5: Turn as shown using the gouge, roundnose, and skew as needed to create the various profiles. A diamond point chisel may be helpful for cleaning up the base profile.

Once the turning has been completed, the piece is sanded while still on the lathe. Start with 100 grit sandpaper, then follow with 150 and 220 grit. For an exceptionally smooth surface, add a final sanding with 400 grit.

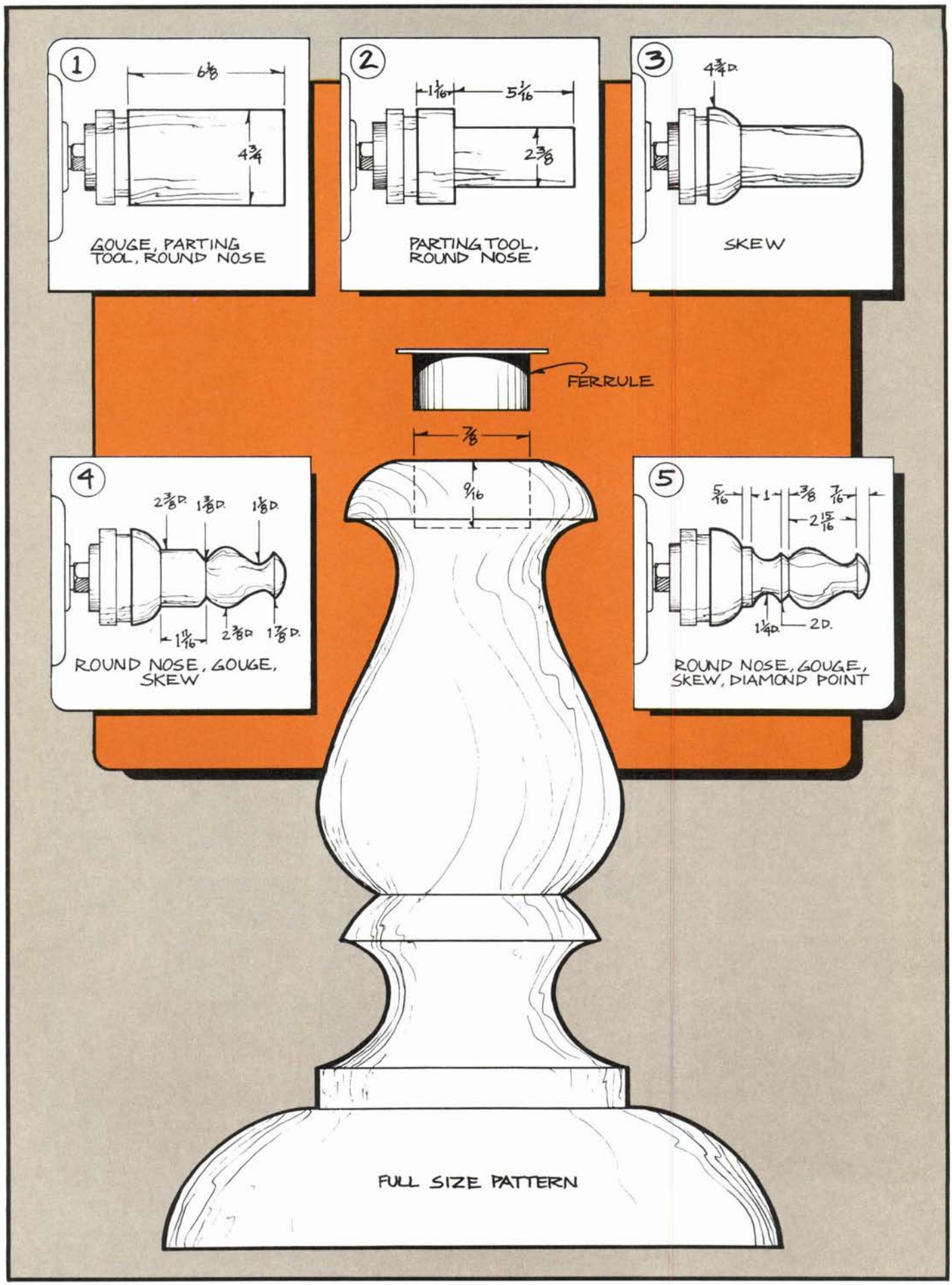
The parting tool is used to cut off the blank. Make the parting cut at the bottom of the candlestick base; however, don't cut all the way through. Instead, allow about ½ in. diameter to remain. Remove the faceplate from the lathe, then unscrew the faceplate from the blank and use a hand saw to cut through the remaining ½ in. diameter.

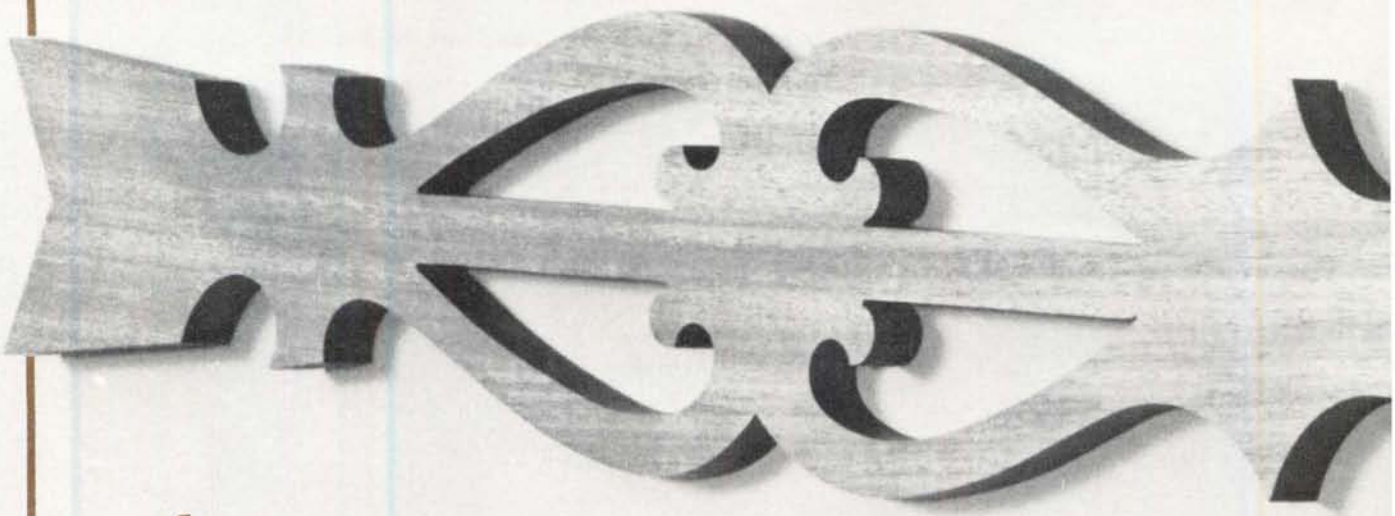
Sand the bottom of the candlestick until it is flat. Once the bottom is flat, use the drill press with a Forstner bit to bore a ⅞ in. diameter by 9/16 in. deep hole for the candle cup ferrule. If not available locally, the ferrule can be ordered from The Woodworkers' Store, 21801 Industrial Blvd., Rogers, MN 55374 (specify part no. B1480).

For a final finish we applied three coats of tung oil, rubbing out between coats with 0000 steel wool.

The ferrule can now be added. Protect the top edge of the ferrule with a block of scrap wood, then use a hammer to tap it in place. The addition of a candle completes the project.

WWJ


1
6⅛
4¾
GOUGE, PARTING TOOL, ROUND NOSE
2
1 1/16
5 1/16
2⅜
PARTING TOOL, ROUND NOSE
3
4¾ D.
SKEW
FERRULE
⅞
9/16
4
2⅜ D.
1⅜ D.
1⅛ D.
1 11/16
2⅜ D.
1⅜ D.
ROUND NOSE, GOUGE, SKEW
5
5/16
1
⅜
7/16
2 15/16
1¼ D.
2 D.
ROUND NOSE, GOUGE, SKEW, DIAMOND POINT
FULL SIZE PATTERN



Arrow Wall Decoration

This attractive wall ornament mounted over a mantel will lend an 18th-century touch to your living room.

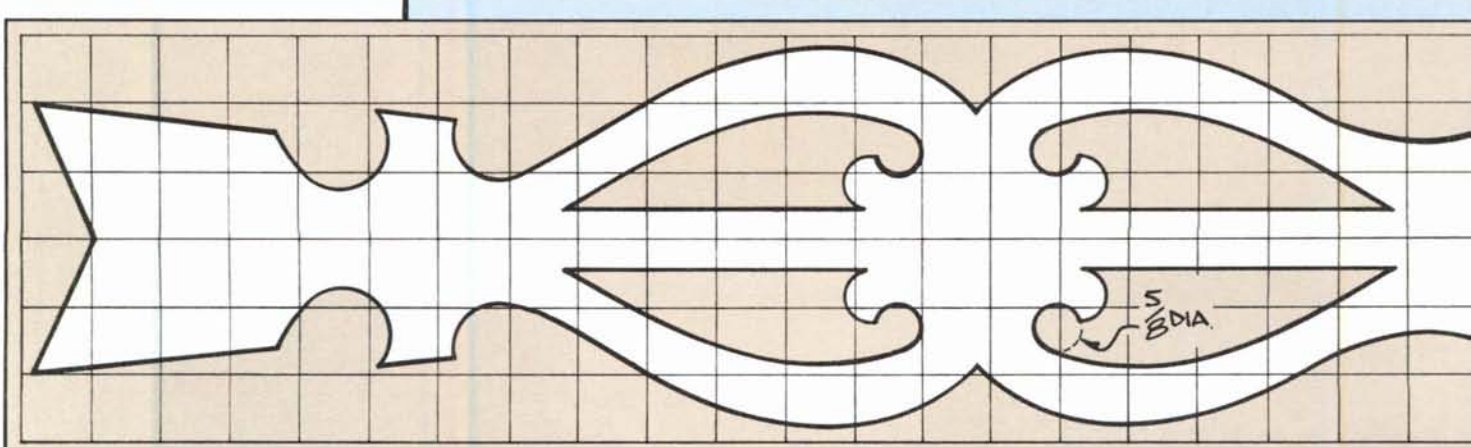
The antique pine weather vane that inspired the design no doubt swung toward the northeast on many a windy March day. But a cozy spot above your hearth will suit the piece just as well.

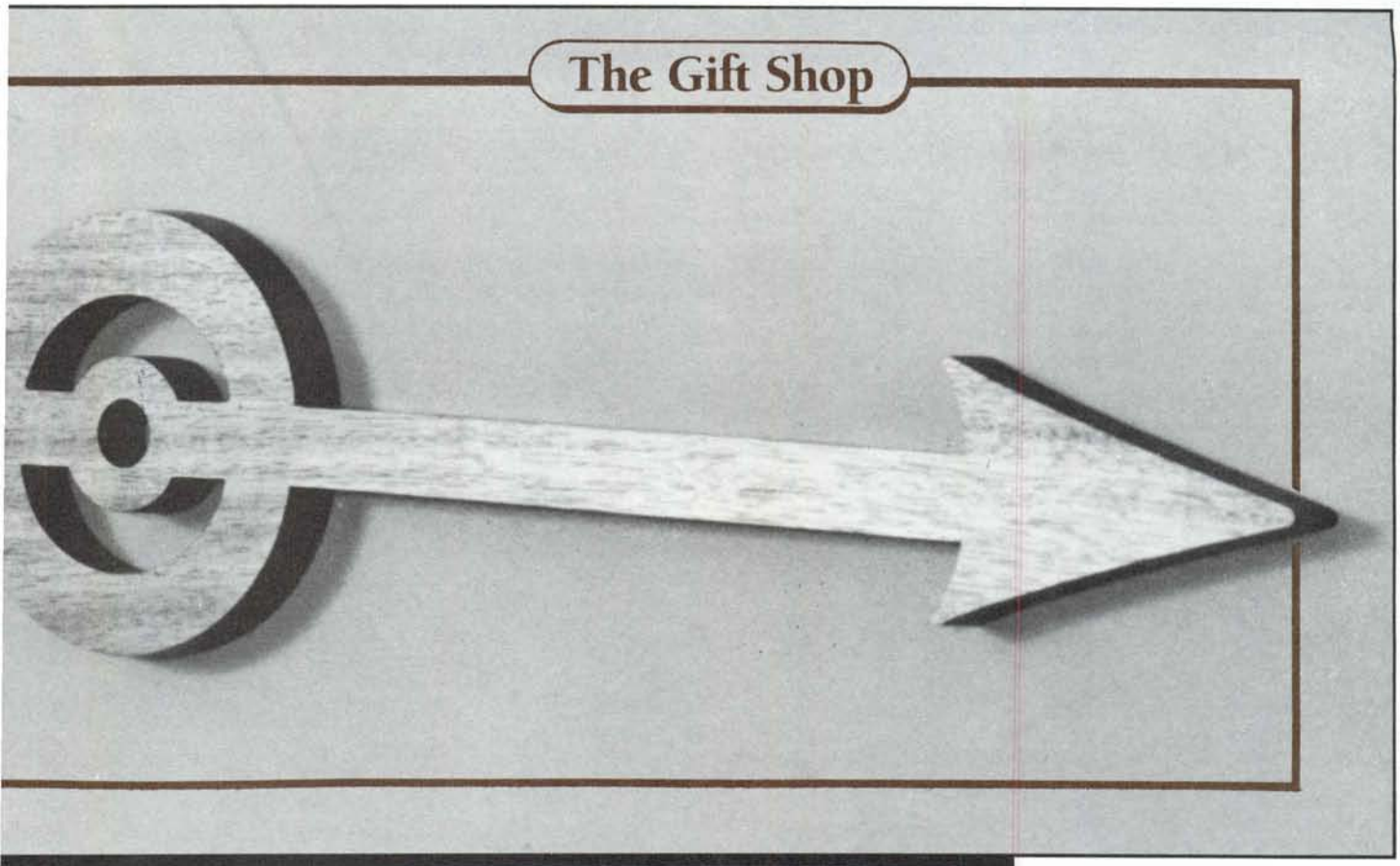
We made ours from ¾ in. mahogany and finished it with penetrating oil. The original piece is featured in *The Pine Furniture of Early New England* by Russell Hawes Kettell.

Start with a blank 6 in. wide and 43 in. long. Lay out the grid pattern on paper and glue the full-size drawing to the stock with rubber cement.

First cut the outside profile with a ⅛ in. blade in the band saw. Stay outside the lines. Clean up the cuts with several sizes of small drum sanders.

Start shaping the inside by drilling five holes, one at the center of the half



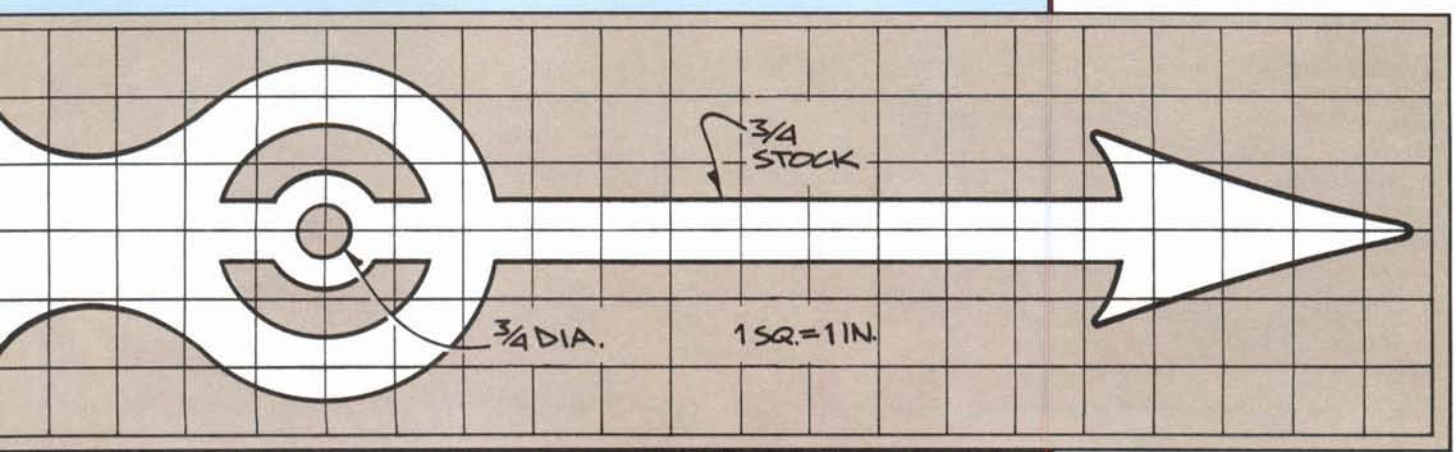


circles and four at the tight radii at the top of the hearts. Drill the holes with ⅝ and ¾ in. Forstner bits as shown.

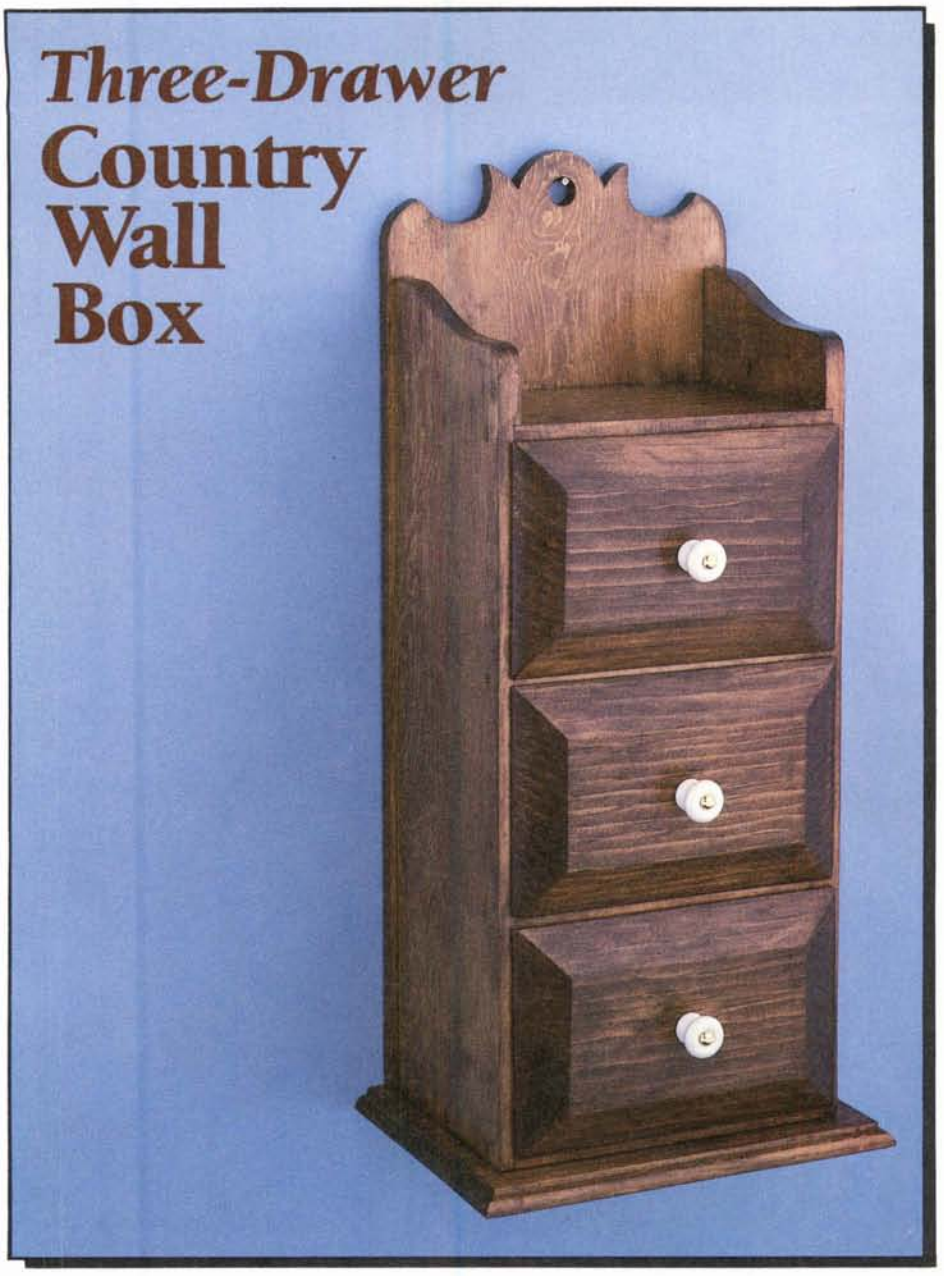
Because of the arrow size, a scroll saw won't work on the inside cuts, so use a hand-held jigsaw with a fine blade or a coping saw. To start your cuts, use your drill holes and make several more in strategic spots of the waste material. Cut the gentle curves and straight sections first, letting the waste drop out. When you cut the tight curves, most of the material will be gone, allowing free movement of the saw blade.

There is just no easy way to clean up the inside cuts. We used a series of small files: triangular, half-round, flat, ½ in. diameter round and a small jewelers' file. Hand sand and apply two coats of penetrating oil.

To hang the piece, cut two ¼ in. diameter holes in the back and mount on picture hangers. WWJ



Three-Drawer Country Wall Box



This attractive wall box can be used practically anywhere for storage of small items or knickknacks. Additionally, its drawers hold three by five recipe cards, making it an ideal kitchen accessory.

Adapted from traditional Early American style wall boxes, our version includes a base so it can also be located on a shelf or countertop. While our box is crafted from pine, other woods could be used as well. Oak, cherry, or walnut come to mind as good choices.

You will note that the box itself is constructed of ½ in. thick stock, while ¼ in. stock is used for the drawer bodies. The drawer bottoms are ¼ in. plywood, and the drawer faces are ½ in. stock. While we surface all our project stock ourselves to obtain the desired thickness, readers buying nominal pre-surfaced material should note that actual thicknesses may be slightly under the specified dimension. For example, nominal ½ in. stock may actually measure only 7/16 in. Adjust dado width and other dimensions as needed if you use thinner stock.

Start by cutting the ½ in. pine for the sides (A), back (B), base (C) and shelves (D). Next lay out the grid patterns and cut the scrolls on the back and sides as shown. Mount the dado blade in a table or radial-arm saw and cut the through dadoes in the sides for the shelves. Cut the bead on the base with a ⅜ in. round-over bit in the router.

The ⅛ in. diameter slotted screw holes in the back allow it to expand or contract independently of the box. The two 3/16 in. diameter mounting holes are for attaching the box to the wall.

Sand before assembling and use glue sparingly to prevent it from squeezing out when the piece is clamped. To assemble, first fit the four shelves in the dado joints, then attach the back with 1 in. long by number 6 flathead wood screws. Square up the piece before tightening the screws.

Drill and peg the sides into the shelves and fasten the base with glue and a clamp.

When making the drawers, remember to size them to the actual openings, keeping them slightly smaller so they slide easily. If your box opening measures 5⅝ in. across as shown, make the drawer fronts (E) and backs (G) 1/16 in. shorter than indicated.

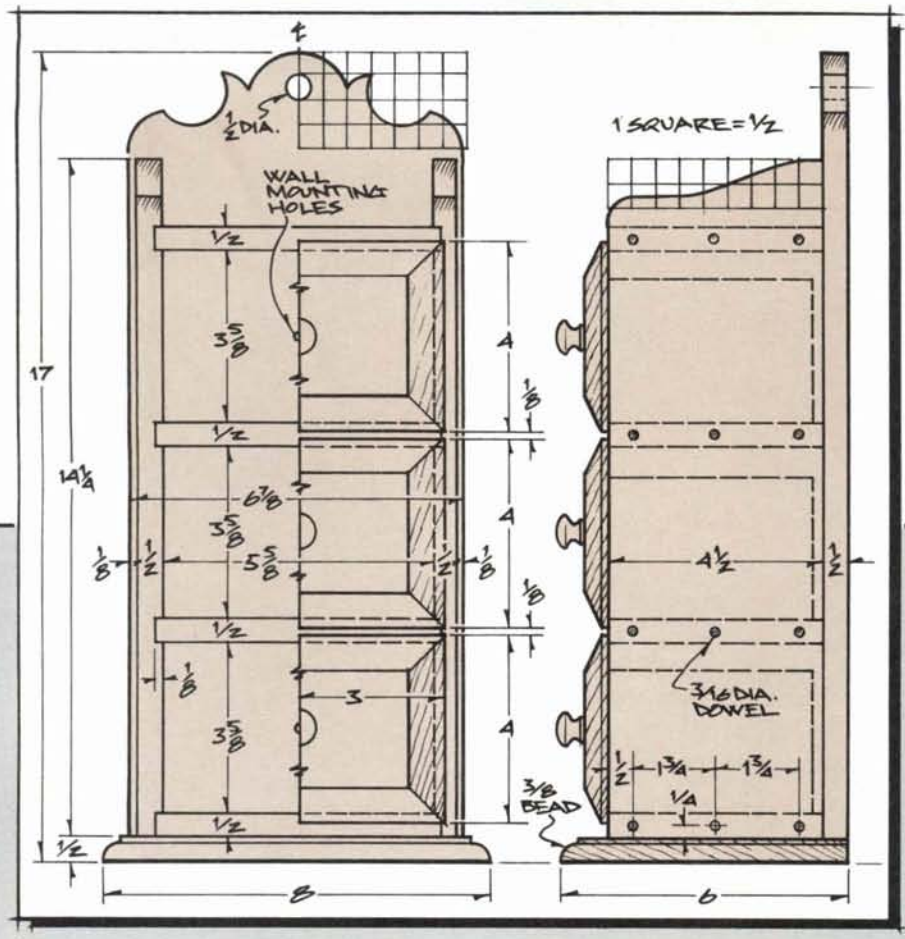
A ⅛ by ¼ in. groove in the drawer sides and front houses the drawer bottom (H). When cutting the drawer parts and the grooves for the bottoms, remember to set the saw once for each operation. This insures the parts are the same size and will fit neatly together. The drawer boxes are assembled with finish nails.

If you want, you can cut all the drawer and box parts at the same time, just leaving drawer parts slightly long (there's plenty of built-in clearance in the width). You can shave them to the proper size just before assembly. That way you can cut all the parts, remove the saw blade and cut all the grooves with the dado blade.

To cut the drawer faces (I), set the table saw blade at 65 degrees and use a high fence for stability as you pass the workpieces past the blade. For even greater stability, use a finger board. Cut the end-grain sides first to prevent splintering from marring the finished face. Use a push stick for the operation as the pieces are rather small. Fasten the faces to the drawers with ½ in. long screws.

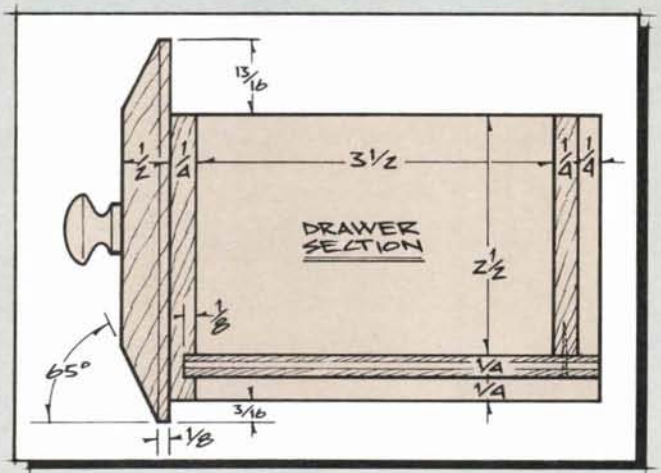
We finished the piece with Minwax Special Walnut stain, followed by an application of satin polyurethane.

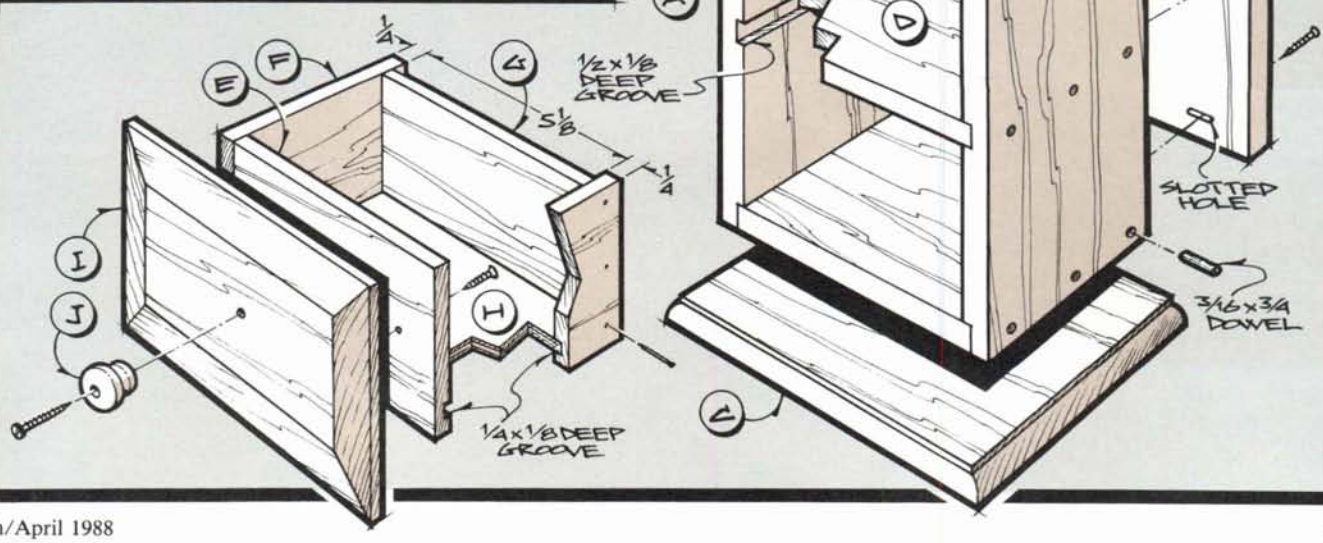
Traditional porcelain drawer pulls (J) complete the project. WWJ



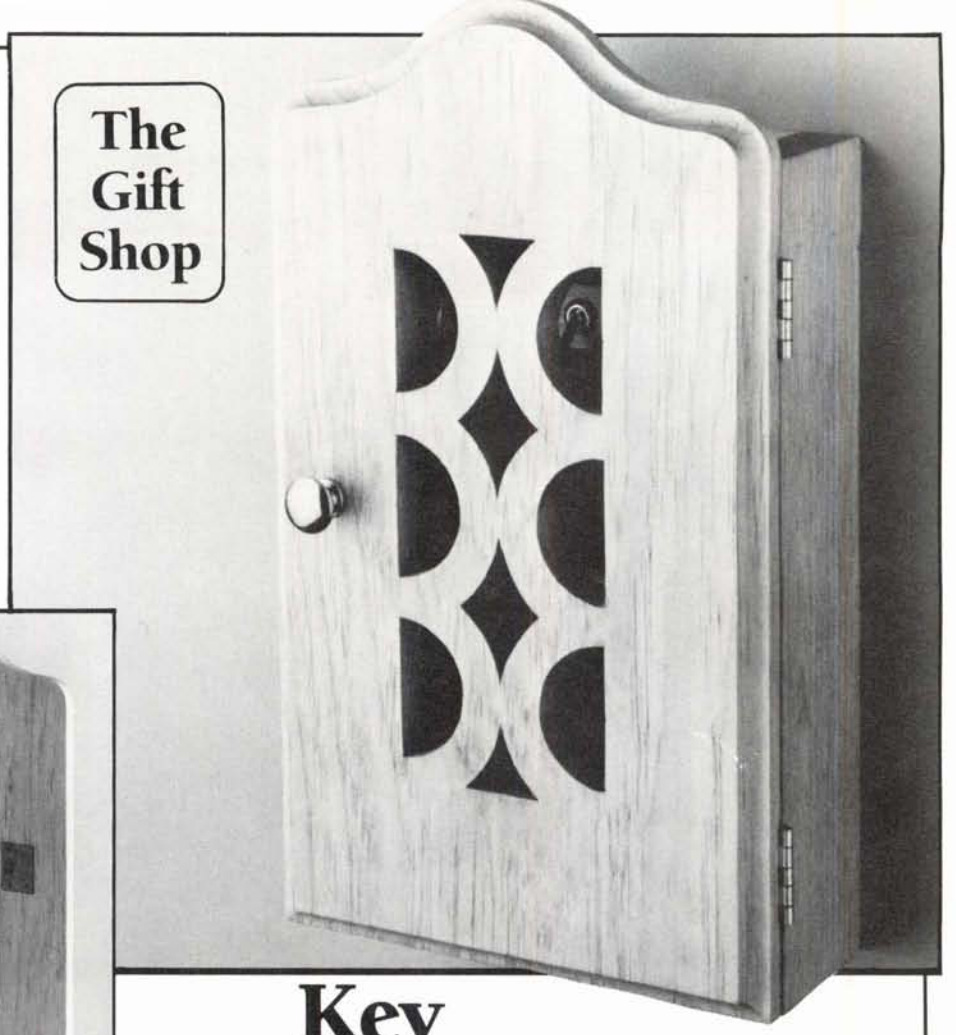
Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Side	½ × 4½ × 14¼	2
B	Back	½ × 6⅞ × 16½	1
C	Base	½ × 6 × 8	1
D	Shelf	½ × 4½ × 5⅞	4
E	Drawer Front	¼ × 3 × 5⅛	3
F	Drawer Side	¼ × 3 × 4¼	6
G	Drawer Back	¼ × 2½ × 5⅛	3
H	Drawer Bottom	¼ × 4⅛ × 5⅜	3
I	Drawer Face	½ × 4 × 6	3
J	Drawer Pull	¾ dia.	3

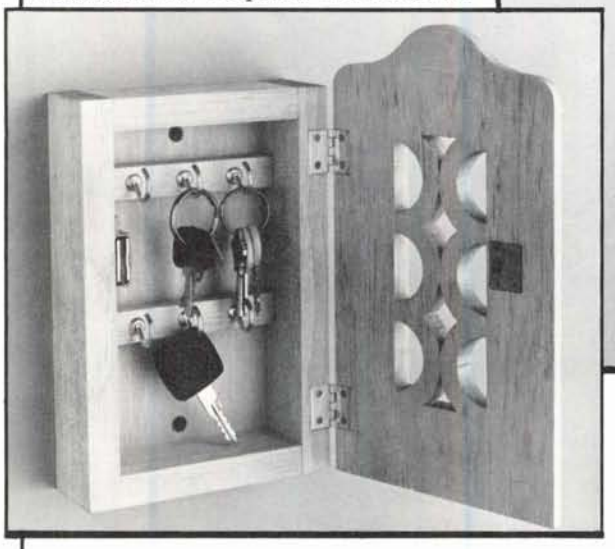




The Gift Shop



Key Cabinet



Hanging this simple cabinet beside the door may save moments of frantic searching when you're already late for work. And hung out of reach, it may also prevent your keys from walking away to a toddler's favorite corner.

The piece is made from pine, available at any lumber yard, and finished with Minwax Golden Oak stain. For the ½ in. thick door you may have to mill down a ¾ in. pine board, using a hand plane or jointer.

Start by cutting the pieces to size, leaving a little extra on the width of the door (E) to allow for some shrinkage.

Join the sides (A) to the top and bottom (B) with ¼ in. diameter by 1 in. long blind dowels. Lay out the dowel locations with a square. Note that the dowels are placed ⅜ in. from the front edge, but ⅝ in. from the rear edge to account for the ¼ in. deep rabbet housing the back.

Before marking, orient the sides, top and bottom the way you want them for final assembly.

After marking the holes, clamp the piece to the table of the drill press, and drill one side of each joint with a Forstner or brad-point bit. If you don't have a drill press, just do your best to hit 90 degrees. The soft pine will forgive a slight skew. You can then find the opposite holes using your marks. Or, to prevent errors from creeping in, use dowel centers.

You will cut the dowels 1 in. long, so make the holes slightly deeper than ½ in. to allow the glue some room and prevent the dowels from holding the joint open.

Glue up the box using two clamps. Apply glue to the dowels only since the end grain won't contribute to strength.

After the glue dries, remove the clamps and cut the ¼ in. by ⅜ in. rabbet for the back (C). We used the router table with a ⅜ in. bearing-guided router bit set to a ¼ in. depth.

Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Side	¾ × 2 × 9½	2
B	Top/Bottom	¾ × 2 × 4½	2
C	Back	¼ × 5¼ × 8¾	1
D	Mounting Block	½ × ¾ × 4½	2
E	Door	½ × 6 × 10¾	1
F	Hinge	1 × 1 brass	2
G	Knob	⅝ dia. brass	1
H	Cuphook	1 in. as shown	6
I	Magnetic Catch	as shown	1

Transfer the door pattern to the milled pine. Cut the curves with a fine blade in the scroll saw or hand-held jigsaw. Sand the outside edge, then set the ¼ in. cove into the edge of the door with the router table as shown.

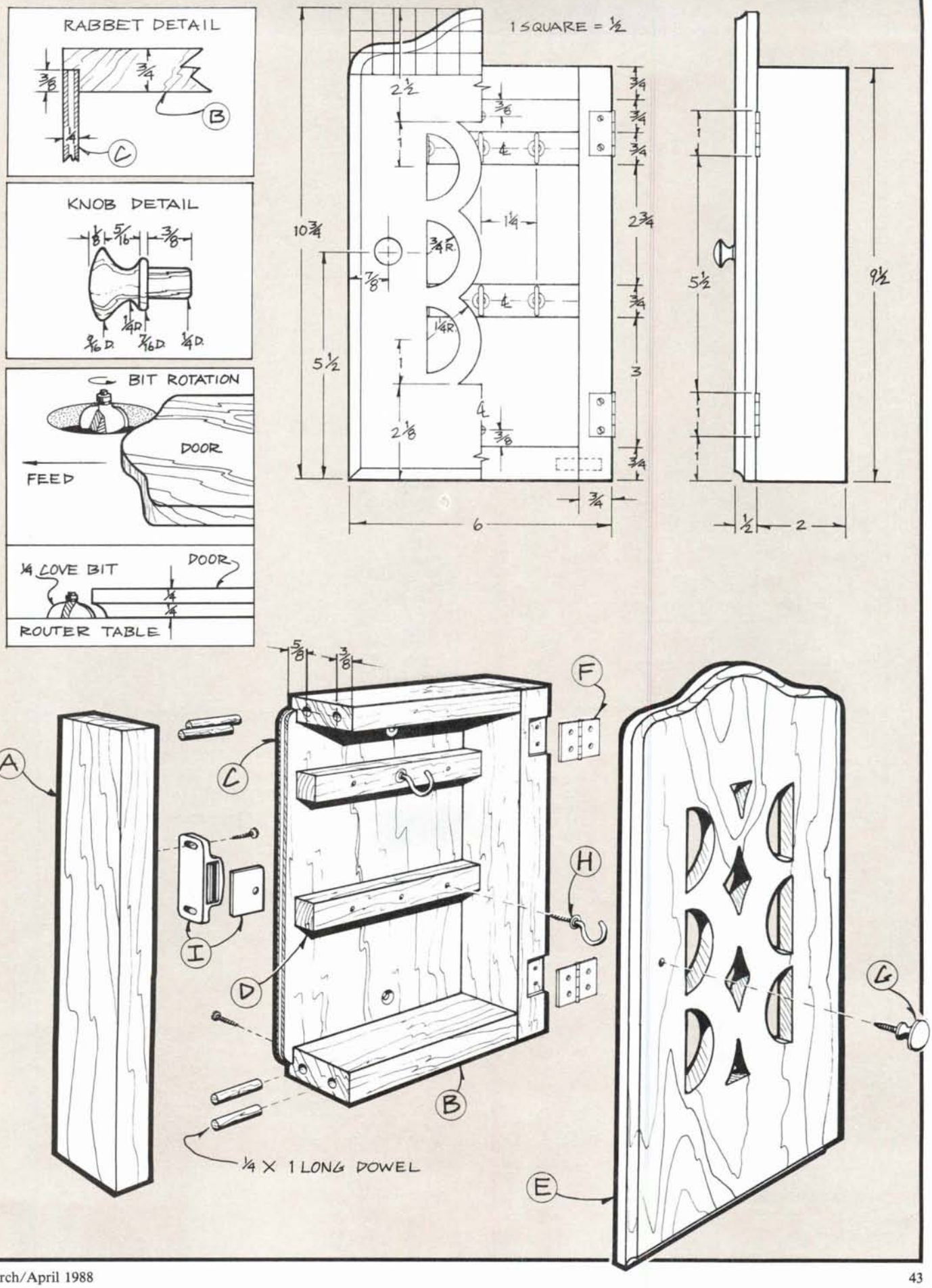
Next, set the back into the box. Either square up the rabbet with a chisel or put radii at the corners of the ¼ in. plywood. The radius must match the rabbet cut into the box by the router. Our ⅜ in. bit had a 1¼ in. diameter and a ⅝ in. radius, but your bit may be different. Just measure the diameter.

To ease clamping of the mounting blocks (D), set the back into its rabbet and mark their locations. Then remove the back and clamp the mounting blocks in place. Use a thin line of glue on both block and back. While the glue is drying, mortise out the door and sides for the hinges (F). Finally, drill and countersink holes in the back: ten to join the back to the cabinet and two for mounting on the wall. Use no. 6 by ½ in. flathead wood screws for fastening, and no. 8 by 1½ in. flathead wood screws for mounting.

Sand the piece before assembling. Mount the magnetic catch (I) before the cuphooks (H). The hinges, knob (G), and catch are all available from Constantine's, 2050 Eastchester Rd., Bronx, NY 10461. The cup hooks are available at any hardware store.

We used a brass knob; however, if you prefer, a wood knob can be turned to the dimensions shown in the detail.

WWJ


RABBET DETAIL
B
C
KNOB DETAIL
BIT ROTATION
DOOR
FEED
¼ COVE BIT
DOOR
ROUTER TABLE
1 SQUARE = ½
10¾
5½
2½
1¼
2¾
3
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E
¼ X 1 LONG DOWEL

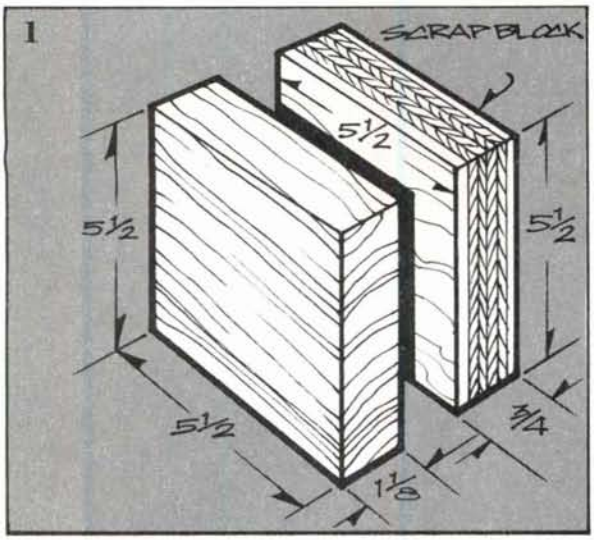


Figure 1: Cut the block for the box and a piece of scrap plywood to the dimensions shown.

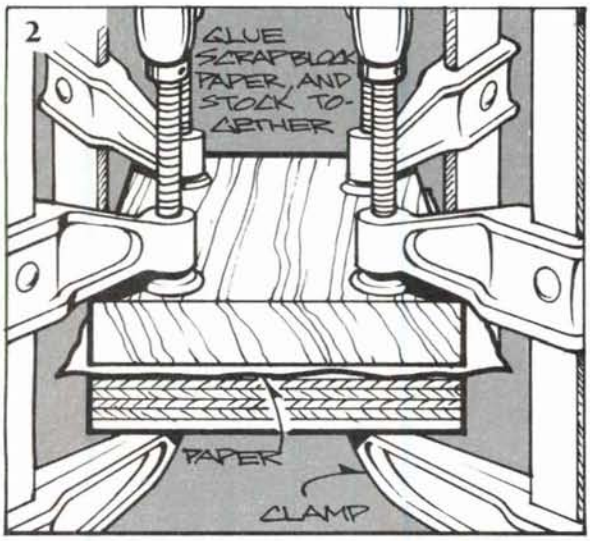


Figure 2: Glue and clamp the two blocks together using brown kraft paper in between.

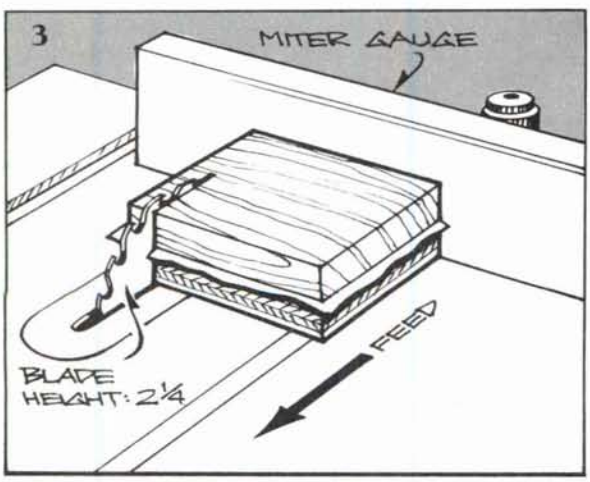


Figure 3: After the glue dries, set the table saw blade to 2¼ in. and, using the miter gauge, crosscut the block to 5 in.

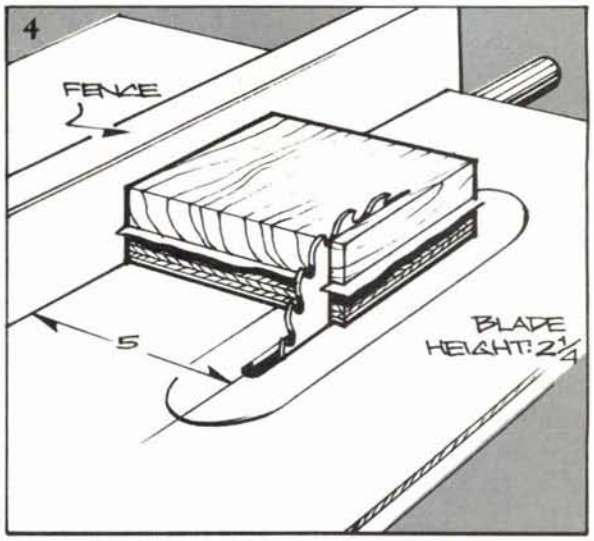


Figure 4: Rip the block to 5 in.

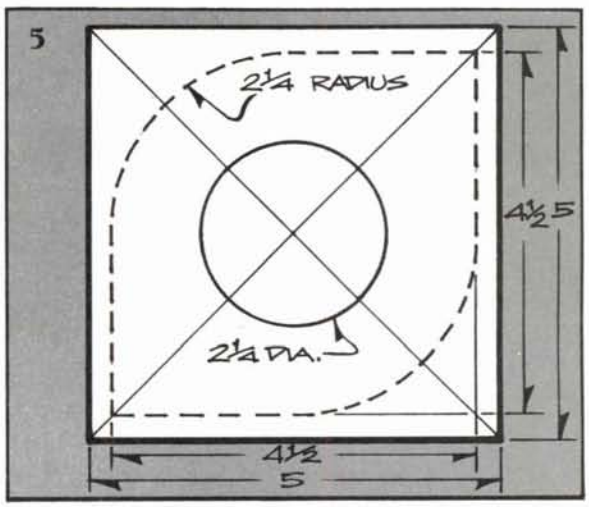


Figure 5: Lay out the location of the 2¼ in. diameter hole and also the outside profile of the box.

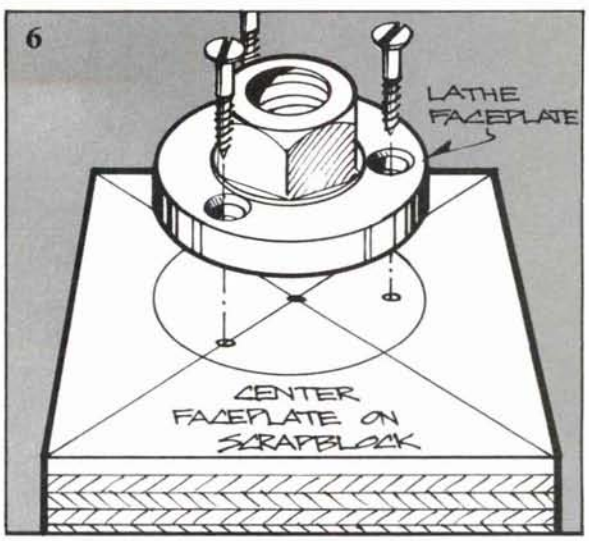
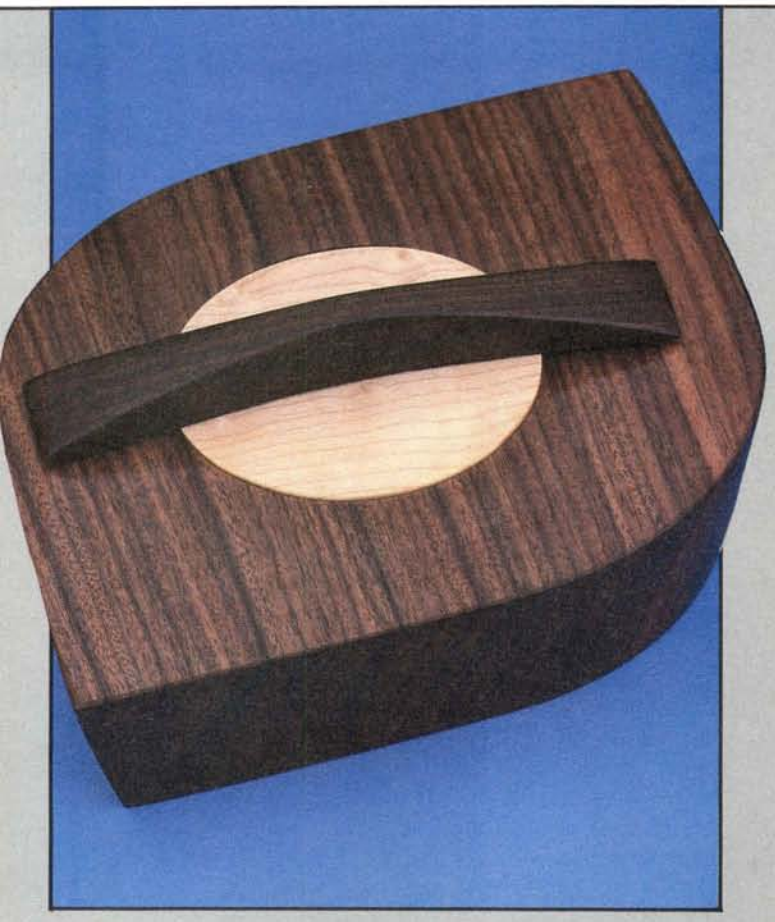


Figure 6: Find the center of the scrap side of the block, inscribe a circle and fasten your faceplate.



This small box, designed by California woodworker Robert Leung, makes a useful addition to any desk. We find it's just the right size for paper clips or stamps.

Leung used pau ferro (Santos rosewood) for the body, and bird's-eye maple and East Indian rosewood for the lid. He also makes similar boxes in various sizes and different combinations of exotic and domestic hardwoods. A mail-order source for rare or unusual hardwoods is Berea Hardwoods Co., 125 Jacqueline Drive, Berea, OH 44017.

With the angles and inside turning, the project may appear difficult, but any moderately experienced woodworker can successfully complete the box by following this step-by-step procedure. We suggest cutting the box angle, a 10-degree slope toward the bottom, with a disc sander after cutting the profile with a band saw. The inside turning is easily done with roundnose and spear-point chisels.

The inside dimensions aren't critical, so don't worry if you don't exactly match the plans. For a snug fit be sure to cut the circle for the lid after making the opening.

To begin you need a block of ¾ in. pau ferro (or another hardwood) 5½ in. square, a scrap block the same size, a piece of maple at least 2¾ in. square and a strip of rosewood ¾ in. by ¾ in. by 4 in. Then just follow our step-by-step procedure that begins on the facing page.

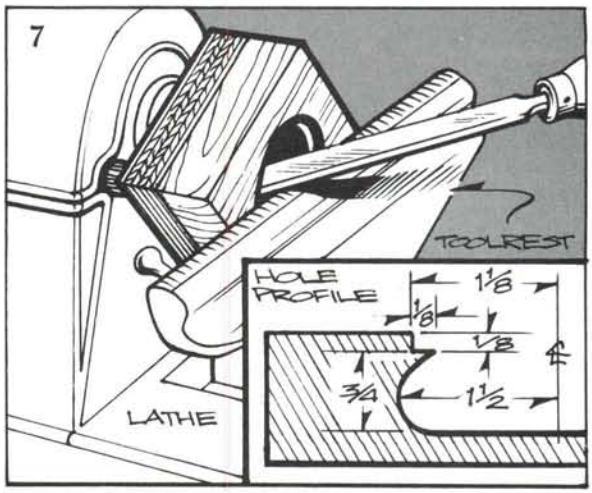


Figure 7: Set the lathe tool rest about ¼ in. below the center of the work and rough out the opening. Setting the tool rest low will prevent a nub from forming at the center of the piece. Use a spear-point chisel for the ⅛ in. by ⅛ in. lip and a roundnose for the inside cove. Be careful to angle your tools from the rear of the lathe toward the front.

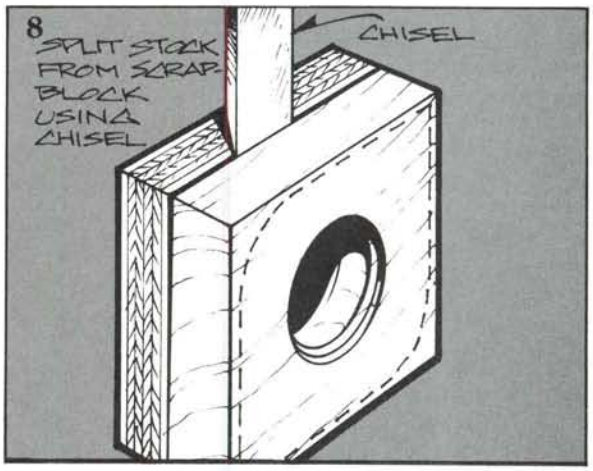


Figure 8: Remove the turning and split the scrap block off with a chisel, working the tool back and forth until the piece starts to separate.

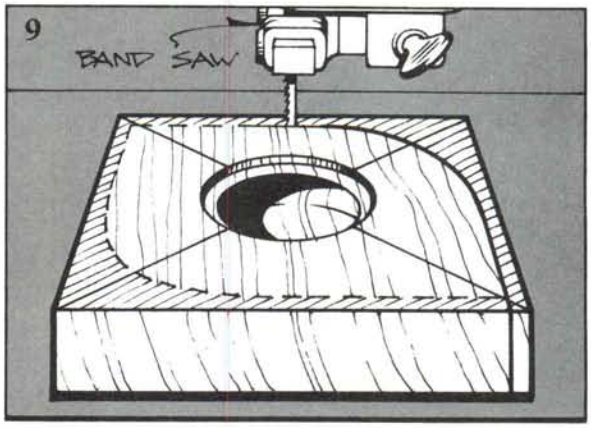


Figure 9: Band saw the outside profile.

(continued on next page)

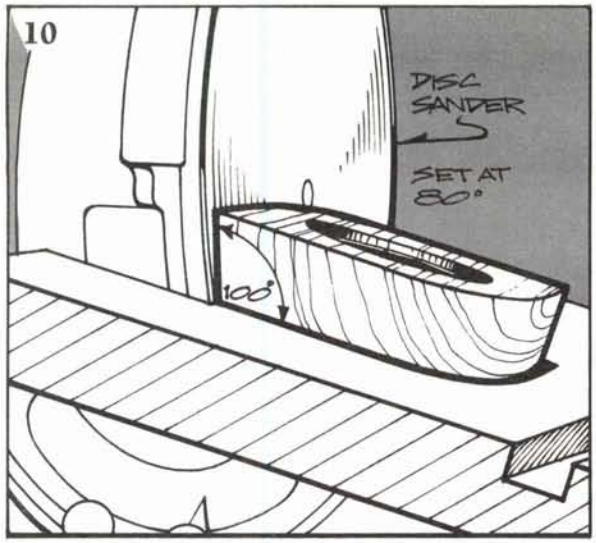


Figure 10: Set the disc sander 10 degrees off square and grind the bevel to slope toward the bottom.

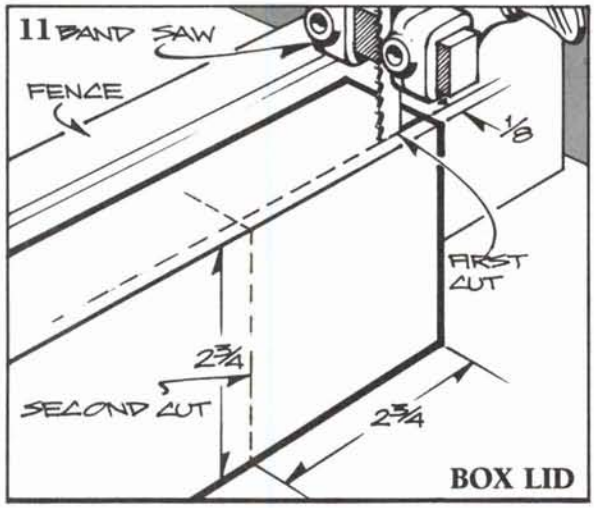


Figure 11: To get stock for the lid, resaw a piece of maple to the dimensions shown, using a ½ in. or wider blade. Clamp the ⅛ in. thick lid stock flat to let it acclimate before cutting the lid to shape. If the lid stock is not allowed to acclimate, it may warp and possibly shrink out of round over time.

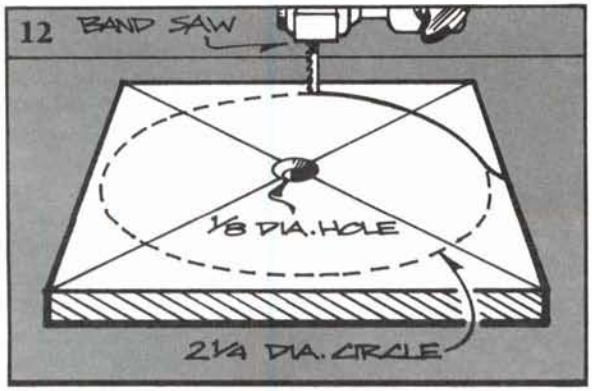


Figure 12: Drill a ⅛ in. shank hole in the center of the lid stock and countersink the hole. Then lay out and cut the circle on the band saw.

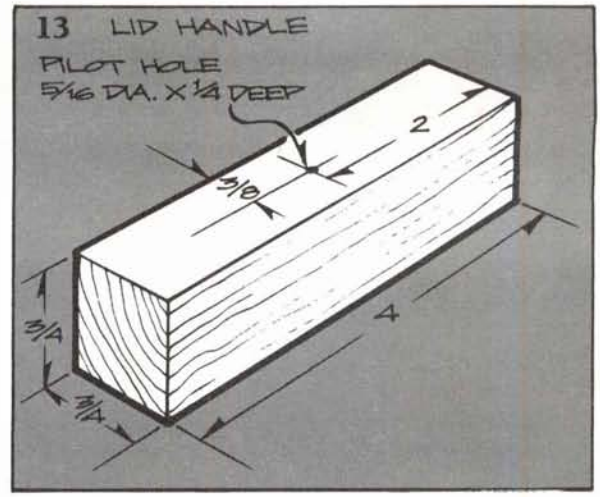


Figure 13: Cut the lid handle block to size and drill the pilot hole. Lay out the curves with trammel points or a compass.

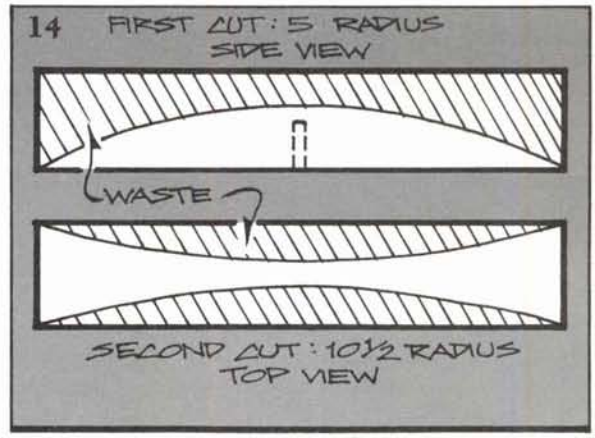


Figure 14: Cut the 5 in. radius in the handle, being careful to cut the side away from the pilot hole, and then cut the two 10½ in. radii on the sides. Stay outside the lines.

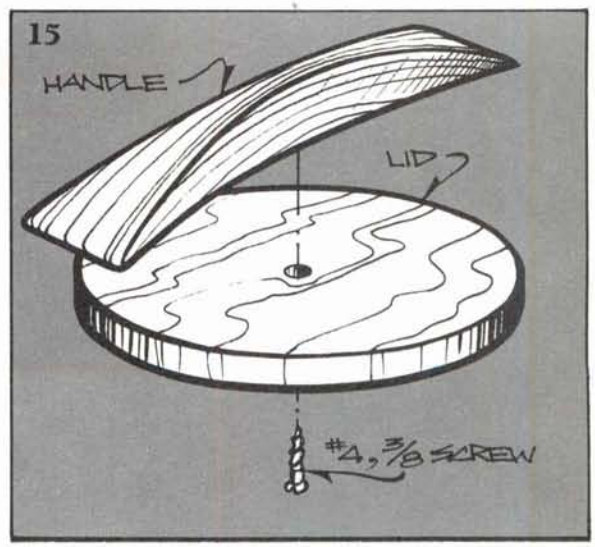
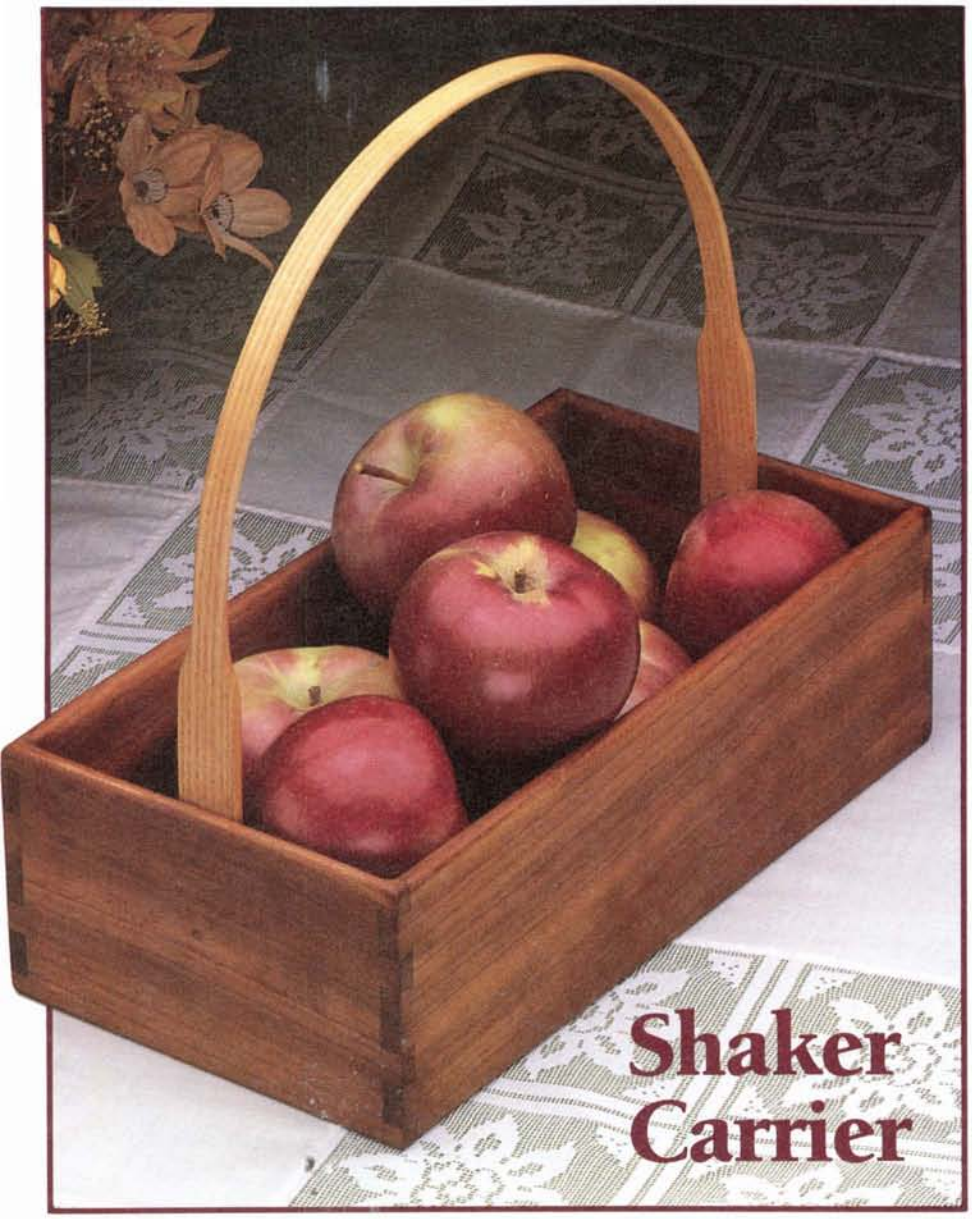


Figure 15: Clean up the cuts with a drum sander, thoroughly hand sand all parts, and assemble. Finish with a clear penetrating oil. WwJ



Shaker Carrier

This carrier, by craftsman Joe Robson of Trumansburg, New York, was a juried selection in the Shaker Workmanship 1987 exhibit at Hancock Shaker Village in Hancock, Massachusetts.

Robson tells us that the carrier is a hybrid design, patterned generally after Shaker carriers of a similar style. Coincidentally, an original Shaker piece nearly identical in every respect to his was sold at a New Hampshire auction in 1984 for over $4,000.

The carrier is crafted in black cherry with a white ash bentwood handle, and features a simple dovetail construction, with a raised profile bottom panel in a groove housing. If you are unable to resaw to obtain the ¼ in. thick stock for the sides, ends, and bottom, ¼ in. thick cherry stock surfaced both sides can be ordered from Craftsman Wood Service, 1735 West Cortland Court, Addison, IL 60101.

If you have never tried hand-cutting dovetails, this is an ideal project to get started. As for proper terminology, the segments cut on the ends of parts A are called the dovetails, presumably because they look like the tail of a dove. The pins are the corresponding parts on the ends (B) that fit in between the dovetails on parts A. Begin by laying out the three dovetails on each end of part A. Ideally, the length of the dovetail should be equal to the thickness of part B (¼ in.), plus about 1/32 in. When the pins are cut, they too will be slightly longer (1/32 in.) than the thickness of the sides. Later, when the joint is assembled, the dovetails and the pins will both stand a little proud and will be sanded flush with the carrier sides.

Lay out the dovetails very carefully using a hard, sharp pencil. Once the tails have been laid out, mark the waste material between with an "X" to avoid confusion. In addition to scribing the tail layout on the face of the board, carry the lines across the end grain. Now clamp the side in a vise and use a fine-tooth dovetail saw to make the angled cuts that will establish the tails. Cut just on the waste side of the line, grazing but not removing it. Bring the cuts almost — but not quite — to the scribed bottom line. A coping saw is now used to cut across the grain and remove the waste. Take the side from the vise, clamp it flat on the workbench over a scrap board, and use a sharp chisel to dress the sides and bottoms of the cutouts.

The pins on the carrier ends should be laid out and marked using the finished dovetails as a template. To do this, clamp the end vertically in a vise, lay the dovetailed side in position on the end, and trace the dovetails with a sharp pencil or X-acto knife. Use a small square to carry the scribed lines onto the face of the board, remembering to add the extra 1/32 in. as noted earlier.

Mark the waste portion between the pins with an "X", then cut out using the same technique as for the dovetails. A well-fitted dovetail should fit together with only light tapping from a mallet and scrap block. If needed, trim further with a sharp chisel.

Now cut the ⅛ in. deep by 3/16 in. wide groove that houses the bottom, using a 3/16 in. straight bit in the router table. Note that the groove must be stopped on the sides. Robson cautions the need for extra care here to avoid chipping out the dovetail. The raised panel effect on the bottom can be made on the table saw by passing the panel across the blade on edge, just kissing the blade, to create the 1/16 in. deep rabbet all around. Note that the panel dimensions are sized slightly less than the actual groove-to-groove distance to accommodate possible expansion/contraction.

(continued on next page)

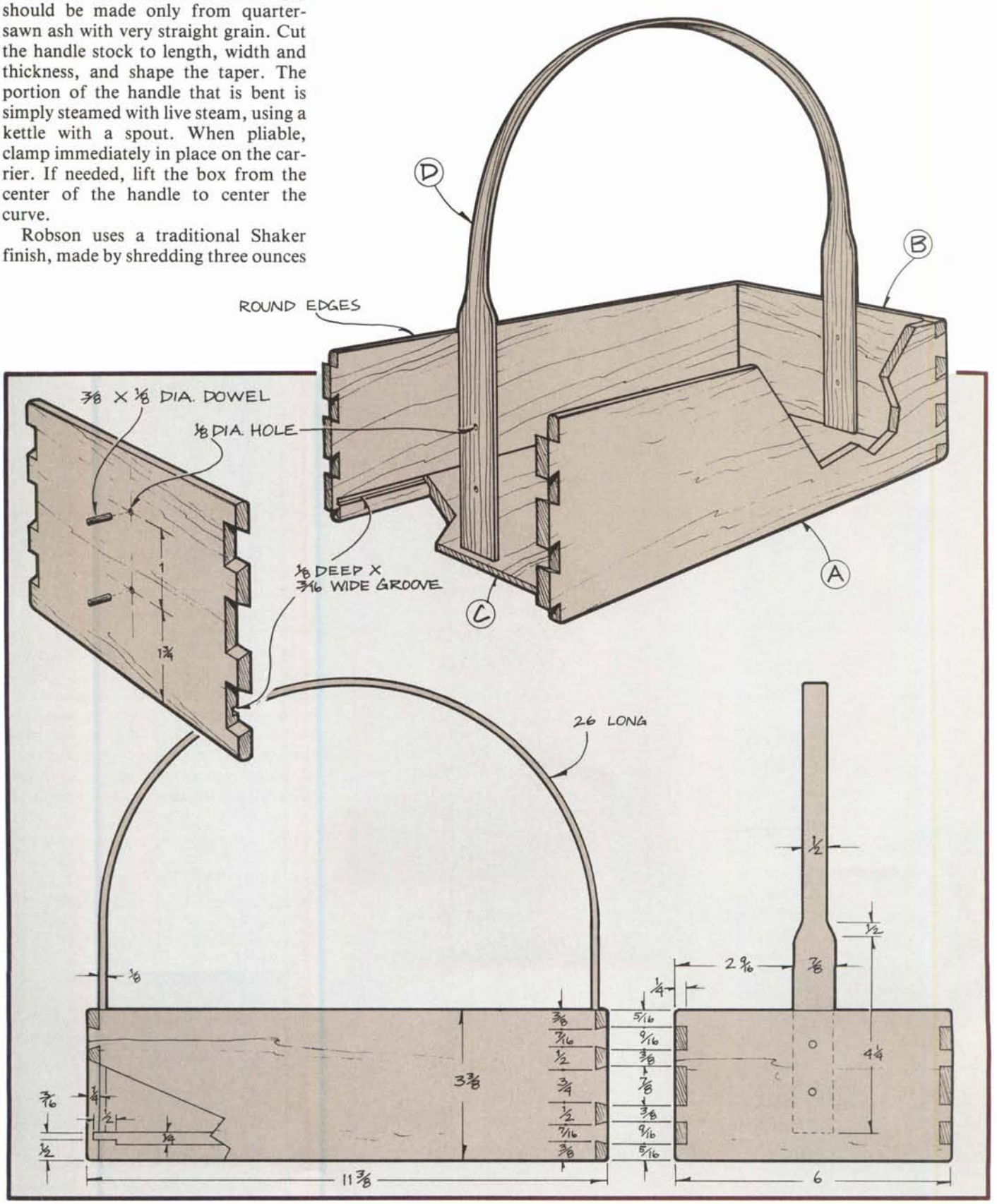
Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Side	¼ × 3⅜ × 11⅜	2
B	End	¼ × 3⅜ × 6	2
C	Bottom Panel	¼ × 5⅝ × 11 1/16	1
D	Handle	⅛ × ⅞ × 26	1

Assemble the sides and ends with the bottom in place, taking care to apply glue to all mating surfaces of the dovetails and pins. No glue is needed on the bottom, except for a dab at each center end to equalize movement.

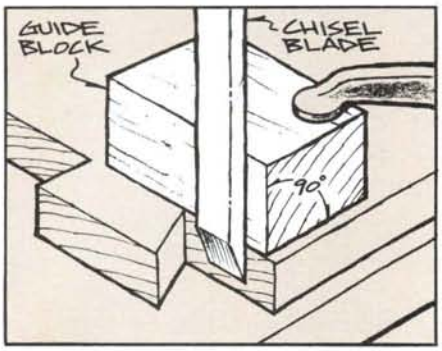
Robson notes that the handle (D) should be made only from quartersawn ash with very straight grain. Cut the handle stock to length, width and thickness, and shape the taper. The portion of the handle that is bent is simply steamed with live steam, using a kettle with a spout. When pliable, clamp immediately in place on the carrier. If needed, lift the box from the center of the handle to center the curve.

Robson uses a traditional Shaker finish, made by shredding three ounces of beeswax into a pint of turpentine to dissolve it, and then mixing in one pint of boiled linseed oil. The mixture is applied liberally with a rag, then wiped dry once it starts to tack. Robson adds that the traditional Shaker method required that the finish be applied "once a day for 10 days, once a week for 10 weeks, and once a year thereafter." Cherry will darken naturally over time, a process that can be hastened by exposure to direct sunlight. WWJ



Shop Tips

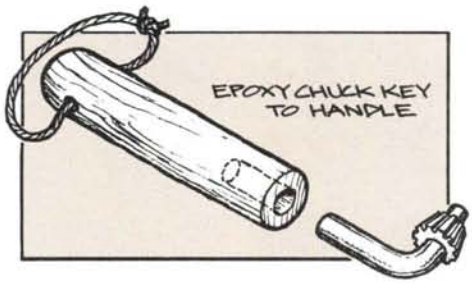
When making a 90-degree cut with a chisel it's difficult to tell if the blade is being held square to the workpiece. This problem is often encountered when making paring cuts for a dovetail joint. In such cases we have found it helpful to cut a guideblock, making



sure the corners are exactly 90 degrees as shown. The guideblock is clamped in place, then the back of the chisel blade is held firmly against it to insure a square cut.

A screw driven into the end grain of wood has minimal holding strength. To improve the holding strength, add epoxy glue to the threads before driving the screw.

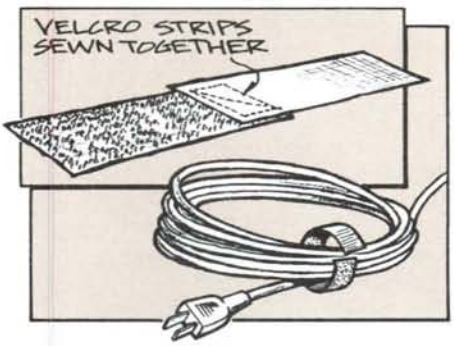
My electric drill came with a rather small drill chuck key, so I often found it difficult to tighten (or loosen) the chuck. However, I've solved the problem by turning a handle from hardwood and boring a hole in one end to



accept the key. A length of ½ in. or ¾ in. diameter dowel stock can also be used. Add a thin coat of epoxy glue to secure the key in place. It sure makes things a lot easier when I have to change drill bits.

J. Benedict, Westerlo, New York

I find that a "strap" made from Velcro helps keep the cords of my portable power tools from getting tangled while in my tool box. To make a strap, first cut two mating strips of 1 in. wide Velcro to length (about a 3 in. length



works well for most cords). Mate the strips so they overlap about ¾ in., then stitch them together at the overlap as shown. As an option, to keep from misplacing the strap, it can be permanently attached if wrapped around the cord and stitched to itself.

Douglas L. Wyatt, Orlando, Florida

***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, Attention: Shop Tip Editor. If you would like the material returned, please include a self-addressed stamped envelope.*

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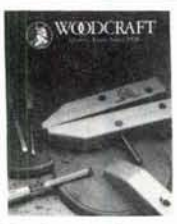

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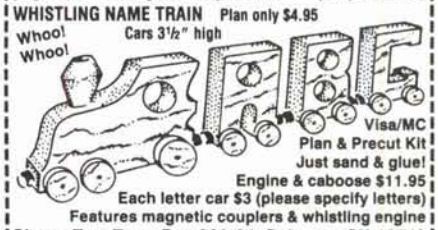

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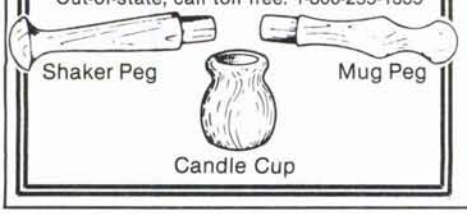

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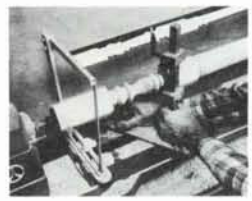

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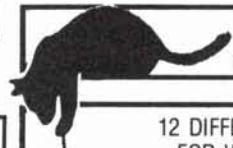

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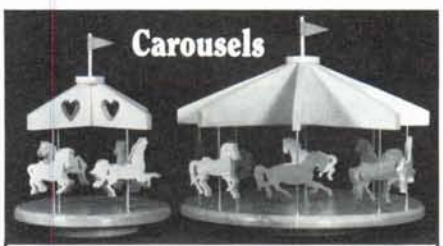

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Vol. 9 No. 3 May-June '85

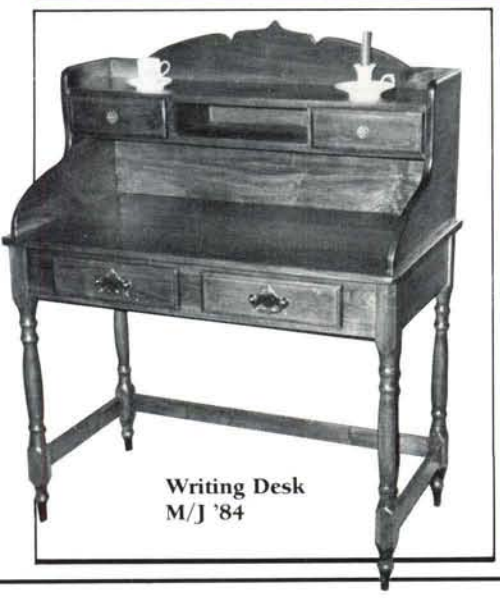
Jacobean Joint Stool, Wall Cabinet with Recessed Finger Pulls, Shaker Desk, Kitchen Cart, Contemporary Wall Clock, Colonial Wall Sconce, Card Box, Towel Bar with Glass Shelf, Marble Race Toy, Cradle, Vanity Mirror, Miter Clamping Jig, *Articles:* Product Liability: Part I; Restoring an Antique Mirror Frame; Coping with Wood Movement; Making Recessed Finger Pulls; The Jacobean Period.

Vol. 9 No. 4 July-Aug '85

Gate-Leg Table, Computer Desk, Shaving Horse, Stamp Dispenser, Crumb Collecting Breadboard, Toy Trucks, Early American Wall Shelf, Pivot-Top Game/Coffee Table, Settle Bench, Shaker Single-Drawer Cupboard, Fold-up Workbench, *Articles:* Product Liability: Part II; Caning and Wood Finishing Supplies; Spray Finishing; Table Saw Basics; Making the Rule Joint; The William and Mary Period.

Vol. 9 No. 5 Sept-Oct '85

Colonial Schoolmaster's Desk, Contemporary Sideboard, Mahogany End Table, Victorian Hall Tree, Cutlery Wall Cabinet, Swing-out Plant Hanger, Prancing Horse Silhouette, Block Puzzle, Iron Caddy, Toy Ironing Board, Early American Water Bench, Wooden Smooth Plane, Shaker Sewing Box, *Articles:* A Craft Fair Visit; How to Use Stick Shellac; A Guide to Circular Saw Blades; Making Bent Laminations; Country Colonial Furniture.



Writing Desk
M/J '84

Vol. 9 No. 6 Nov-Dec '85

Moravian Chair, Dulcimer, Oak Dining Table, Shaker Washstand, Marking Gauge, Veneered Wall Clock, 4 x 4 Off-Roader, Teddy Bear Puzzle, Duck Pull-toy, Landscape Cutting Boards, Early American Tall Clock, Pine Desk Organizer, *Articles:* Secrets of Success; Weaving a Fiber Rush Seat, Part I; Table Saw Ripping Problems and Their Solutions; 4-Piece Book Match Veneering; Pennsylvania Dutch Furniture.

Vol. 10 No. 1 Jan-Feb '86

Freestanding Shelf System, Chippendale Bachelor's Chest, Oriental Serving Tray, Country Bench, Antique Knife Tray, Tape Dispenser, Valentine Box, Toy Tow Truck & Car, Shaker Drop-leaf Table, Shop-made Bow Saw, Child's Settle Bench, Plate Shelves, *Articles:* On Getting Paid for Your Work; Weaving a Fiber Rush Seat, Part II; Table Saw Crosscutting: Techniques & Tips; Router-Lathe Fluting: A Shop-made Approach; Chippendale Furniture; Special Section: Back Issue Index.

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Not Available

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Victorian Whatnot Shelf, Contemporary Lamp, Early American Bench, Steam-bent Clock, Pine Hutch/Cupboard, Canada Goose Basket, Toy Crane, Condiment Holder, Shop Workstation, Parsons Table, Shaker Lap Desk, *Articles:* An Interview with Toymaker Clare Maginley; How to Flatten a Warped Board; A Guide for Choosing Your First Router; Supported Steam Bending; Victorian Period.

Vol. 10 No. 4 July-Aug '86

Shaker Slat-Back Side Chair, Wall-Hung Display Cabinet, Latticework Planter, Country Bucket Bench, Adirondack Chair, Coffee Mill, Clamdigger's Basket, Box of Shapes Toy, Disk Clock, Tenon Jig, Dictionary Stand, *Articles:* Selecting the Right Project for Production; More About Warped Boards; All About Router Bits; The Sliding Dovetail Joint; Furniture Kits Suppliers.

Vol. 10 No. 5 Sept-Oct '86

Desk with Tambour Top, Vanity Case, Stool, Coffee Table, Blanket Chest, Mortar and Pestle, Whale Folk Art Silhouette, Toy Wagon, Cranberry Rake, Router Bit Box, Shaker Drop-leaf Table, *Articles:* Are Your Prices Competitive?; Restoring a Rosewood Chair; Basic Router Operations; Making Tambour Doors; General Woodworking Suppliers.

Vol. 10 No. 6 Nov-Dec '86

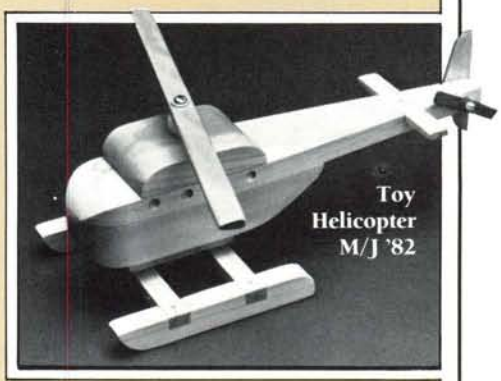
Early American Hamper, Cube Table, Rabbit Pull Toy, Old-Time Sled Wall Shelf, Cassette Tape Holder, Dog/Cat Bed, Vanity Mirror, Early American Washstand, Router Table, Victorian Sleigh, *Articles:* Wholesale and Discount Sources of Supply; Sandpaper Abrasives; Using the Router Table; The Mitered Bead Frame and Panel; Clock Parts Suppliers.

Vol. 11 No. 1 Jan-Feb '87

Shaker Blanket Chest, Glass-Top Dining Table, Dovetailed Stool, Jewelry Box, Door Harp, Toy Firetruck, Canada Goose Mobile, Balancing Sawyer Folk Toy, Early American Style End Table, Jointer Push Board, *Articles:* Direct Mail Promotions — Defining the Market for Your Work; Old Wood; The Mortise and Tenon, Part I; Combination Hand/Router Dovetailing; Special Section: Back Issue Index.

Vol. 11 No. 2 Mar-Apr '87

Shaker Sewing Desk, Garden Bench and Table, Mirrored Wall Shelf, Rhombohedron Puzzle, Wood Sawyer Whirligig, Folk Art Door Stop, Kangaroo Pull Toy, Colonial Pine Wall Shelf, Contemporary Hall Table, *Articles:* How to Create a Direct Mail Promotion; Types of Finish — An Overview; The Mortise and Tenon, Part II; Making Bevel-Edged Drawer Bottoms.



Toy
Helicopter
M/J '82

Vol. 11 No. 3 May-June '87

Display Pedestal, Kitchen Canister Set, Riding Biplane, Contemporary Serving Cart, Napkin Holder, Decorative Planter, Country Vegetable Bin, Pine Medicine Cabinet, Shop Drum Sander, Vienna Regulator Clock, *Articles:* Penetrating Oils and How to Use Them; The Jointer; Veneer, Part I; Decorative Joinery: Dovetail Key Butt-Miter; Caning and Wood Finishing Suppliers.

Vol. 11 No. 4 July-Aug '87

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

Vol. 11 No. 5 Sept-Oct '87

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

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Curio Cabinet, 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, *Articles:* On Glues and Gluing; Band Saw Setup; Making the Continuous Bracket Foot; Step-By-Step To A Flawless Finish On Pine (Or Any Other Wood); Hardware Suppliers.

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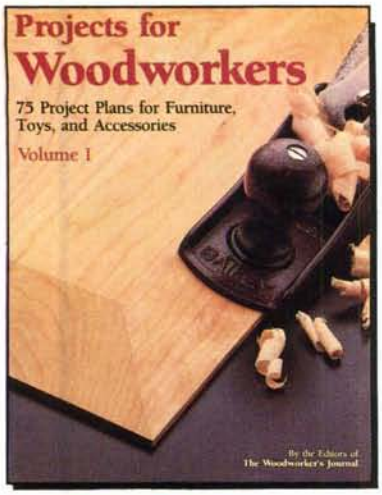
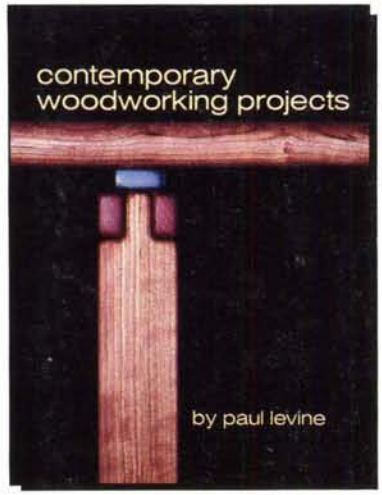
Early American Pierced Tin Cabinet, Contemporary Coffee Table, Puss 'n Books Bookends, Cookbook Holder, Wooden Jewelry, Child's Duck Puzzle, Shaker Wall Clock, Stereo Cabinet and Speakers, Country Occasional Table, Drill Press Jig, *Articles:* Edge-gluing; The Drill Press; Pierced Tin; Four Shopmade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

BOOKS *from* The Woodworker's Journal



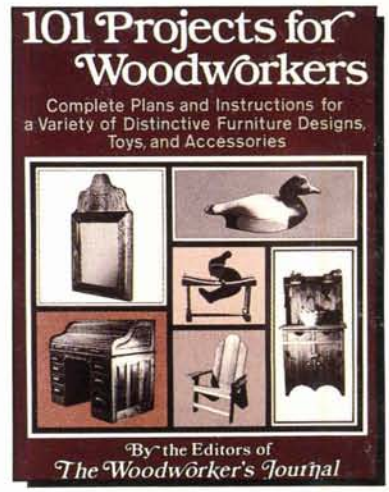
Projects For Woodworkers, Volume 1

Beginning and advanced woodworkers alike appreciate the full range of styles in furniture, accessories, lamps, clocks, toys, and gifts. Projects range from those that can be completed in an evening to some that challenge even the experienced woodworkers.



Contemporary Woodworking Projects

Forty projects featuring the graceful lines of contemporary design. Original designs include furniture and accessories for each room in the home. Clearly written and thoroughly illustrated plans make construction easy for all woodworkers.



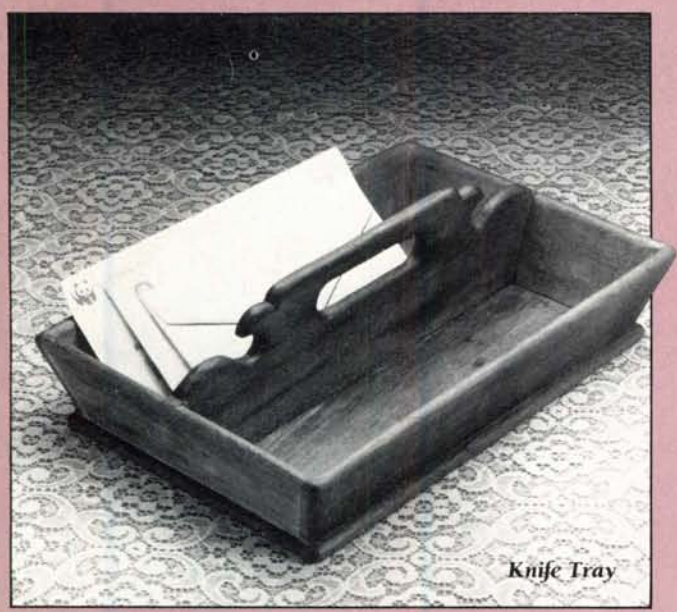
101 Projects For Woodworkers

An unparalleled variety of classic projects from the earliest issues of *The Woodworker's Journal*. For the eager amateur just starting out or the craftsman with a shop full of tools, **101 Projects For Woodworkers** has plans for everyone.

You'll find the handy order form for these books bound between pages 18 and 19.

In our next issue . . .

. . . you'll find complete plans for building these projects: an authentic antique Knife Tray, an Early American Dry Sink and much more.



Knife Tray

Early American Dry Sink