

WEEKEND WOODWORKING

PROJECTS[®]

NEAT THINGS YOU CAN BUILD IN A HURRY

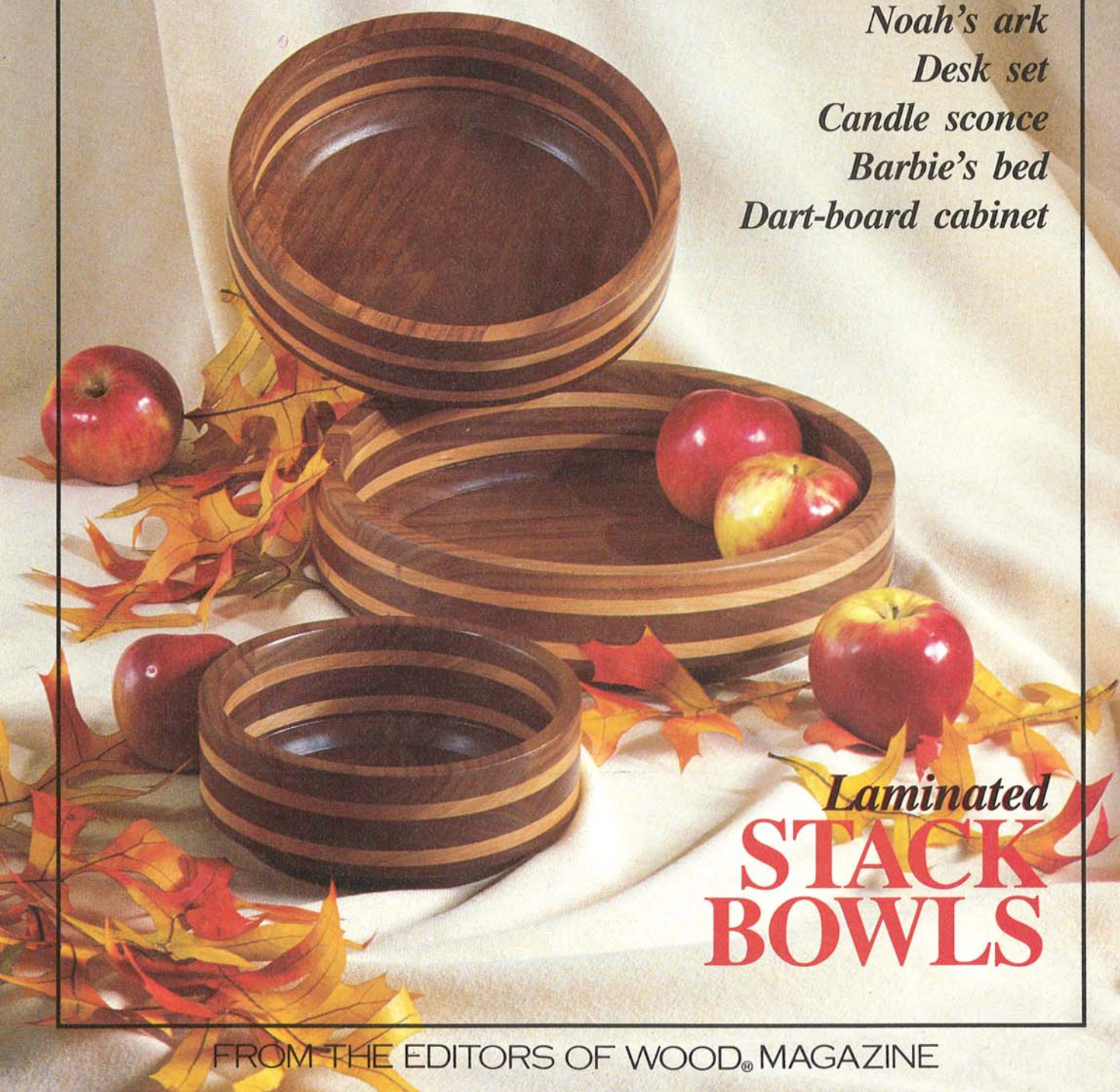
Noah's ark

Desk set

Candle sconce

Barbie's bed

Dart-board cabinet



Laminated
**STACK
BOWLS**

FROM THE EDITORS OF WOOD[®] MAGAZINE

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FROM OUR SHOP

DEAR READER,

Sixteen or more years ago, I spent most of a morning with a fellow on a farm outside of Decorah, Iowa. At that time, Les Seim had recently stepped away from 25 years of mink ranching, and was converting the animal sheds into air-drying shelters for lumber.

In the years since then, Les has built up a pretty fair lumber business in heavily wooded northeast Iowa—right in the heart of some of the country's best-producing walnut timbers. In the early years, he cut native walnut, cherry, red oak, butternut, and a host of other species found on neighbors' farms. Now, Les also sells hardwood, some of it kiln-dried, for people in neighboring Minnesota and Illinois, too.

But it requires more than sawing and drying wood to keep this Norwegian busy. In fact, we attribute Les with two ideas in this issue. For years, he built candle sconces like the project on pages 10 and 11. (He even kept his daughter, Shelley, busy making sconces and other projects.)



Another idea from our friend got us working on the nesting bowls on pages 26–29. Les hates to waste stock (particularly solid hardwood!) for a turning project. He suggested bandsawing three bowls from one slab of wood and then gluing on bases. We took Les' suggestion one step further and developed his idea into the laminated bowls.

These bowls make a sensible exercise for any lathe aficionado, but a particularly savvy one for beginning turners. Once you get into the how-to instruction, you'll see that your bandsaw does most of the shaping work.

The hardwood business keeps Les pretty busy now—he just doesn't have the time to build wooden projects like he once did. And even though he's 71 years young, Les doesn't entertain any thoughts of retiring—at least for now. "I tried that once," Les says about his flirtation with retirement, "and I didn't like it at all. I've just got to stay busy. I'm deeply involved in hardwood—more than I ever dreamed."

Carl Voss

Managing Editor

WEEKEND WOODWORKING PROJECTS

WE CARE!

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OUR PLEDGE TO YOU

PRIOR TO PUBLICATION, WE BUILD EVERY PROJECT FEATURED IN WEEKEND WOODWORKING PROJECTS STEP-BY-STEP IN OUR SHOP. THEN, A SEASONED TEAM OF EDITORS REVIEWS THE HOW-TO DIRECTIONS, TECHNICAL DRAWINGS, ILLUSTRATIONS, AND BILL OF MATERIALS OF EACH PROJECT TO MAKE SURE THE INSTRUCTIONS WE PROVIDE TO YOU ARE CLEAR, CONCISE, AND COMPLETE.

THE WEEKEND WOODWORKING PROJECTS STAFF

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6 Noah's menagerie

Put new life in long-neglected space when you float Noah's ark above a door. We couldn't squeeze in all of Mother Earth's animal kingdom, but we've included enough critters to keep scroll saw enthusiasts smiling for a few hours.

10 Slim, trim sconce

Here's a great accessory—just 4½" wide—that fills a tall decorating order for those skinny wall spaces. Or, design an entire arrangement around a matched pair of our towering sconces.



12 Barbie's bed

If you enjoyed building the miniature armoire in Issue 19, you'll get a charge putting together this matching bed. Just like our earlier project, we've scaled the bed to match Mattel's Barbie and similar fashion dolls.



CHECK OUT THESE TIPS AND JIGS

- Horizontal keyhole slots—page 6.
- Planing extra-thin stock safely on your thickness planer—page 12.
- Aligned cabinet doors—page 19.
- Angular parting cuts—page 29.

Note: To find these tips, turn to the indicated pages and look for the tinted step numbers.

16 Game cabinet

Darts, long a spirited pastime for British subjects, now enjoys an upswing in popularity here in the states. You can bring the sport into your rec room by building this cabinet that houses a challenging ring-toss game, too.



20 Desk-set quartet

Add some warmth to someone's office decor with maple-and-walnut necessities that have quality written all over them. Whether you choose to build all four laminated pieces or a few individual items, you'll realize an excellent return on your investment of shop time when the compliments roll in.



26 Terrific turned trio

Forget about wasting precious hardwood stock when you turn these bowls. We'll show you how to glue up a stack of $\frac{3}{4}$ "- and $\frac{1}{2}$ "-thick wood, and then bandsaw three shapes before you even turn on your lathe. And best of all, the materials cost less than \$10.





ARK-ed DOORWAY

First, prepare the full-sized patterns

1 Enlarge the nine gridded patterns on page 9 by taping $8\frac{1}{2} \times 11$ " sheets of paper end to end to form required lengths. Starting at one corner, draw 1" squares across the surface of each sheet.

Note: Because of size limitations, we can't print full-sized patterns of the large pieces. However, you may order full-sized patterns of them from us. See page 7 for details.

2 Using the gridded patterns as guides, draw each pattern outline on a gridded form. (When enlarging gridded patterns, we first plot the points where the pattern lines cross the grid lines, and then draw lines to connect the points.)

3 Copy the full-sized patterns on page 8. With scissors, cut out all patterns, leaving a $\frac{1}{2}$ " margin around the borders.

4 Prepare $\frac{1}{4}$ " stock for these parts: background layer (A, B), 6×37 " and 3×10 "; goose hill (C),

5×15 "; boat cabin (D), 6×9 "; wave (E), 6×32 "; roof (F), 2×11 "; unicorn hill (G), 4×10 "; tree trunk (H), 9×5 "; and the stem (I) and stern (J). Next, cut the hull (K) and ramp (L) from $\frac{1}{2} \times 5 \times 14$ " stock; the tree canopy (M) from $\frac{3}{4} \times 7 \times 9$ " stock. Use $\frac{1}{4}$ " stock for Noah, the animals, and birds; $\frac{1}{8}$ " stock for both rats and Noah's beard and hair. Now, glue and edge-join the two background pieces where instructed on the pattern, and clamp until the glue dries.

Note: We suggest you cut the parts from at least three different wood species for contrast. For example, we cut the animals from basswood, cherry, walnut, mahogany, and oak. For the ark, we used cherry, oak, and walnut. Walnut also makes up the background and the wave.

5 Sand the best face on each piece with 150-grit sandpaper. Apply a misting of spray adhesive to the back of each pattern, and adhere them to the pieces you just sanded.

'There was green
alligators and
long-neck geese'

And humpty-back camels
and some chimpanzees.
Sorry, there wasn't room
for all of Mother Earth's
wildlife on our ark, but we
did squeeze in the critters
mentioned in the Irish
Rover's classic song, *The Unicorn*. This over-the-door
project focuses attention on
a neglected room area, and
seems perfect for a child's
room—or perhaps a church
school classroom.

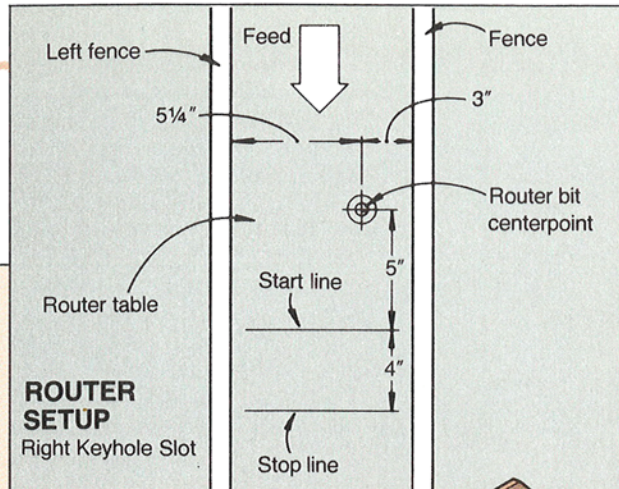
To speed cutting out the animals, stack two pieces of stock face to face with double-faced tape, and adhere the patterns to the top piece.

6 Chuck a keyhole or dovetail bit in your table-mounted router, and set the bit height. See the Router Setup drawing *top right* for details on how to adjust your router table to cut the keyhole slots in the back face of the background. Rout the keyhole slots.

You're ready to scrollsaw

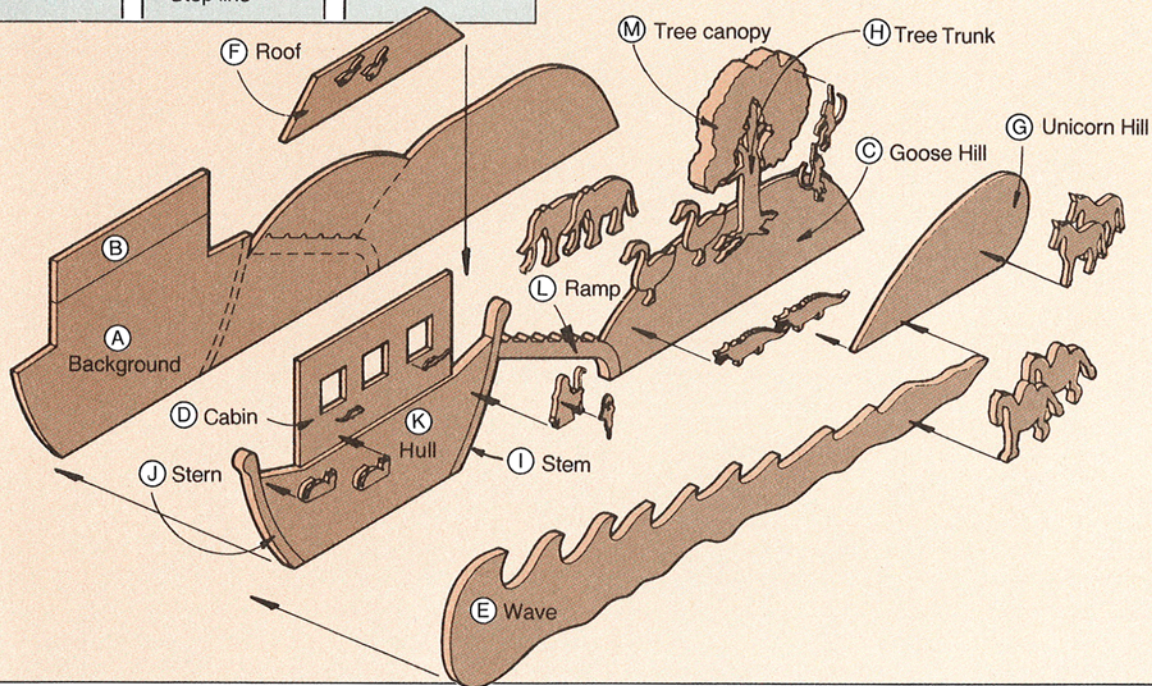
1 Scrollsaw all of the pieces except the ramp. (We used a #5 blade.) Drill $\frac{1}{4}$ "-start holes through the cabin windows, and thread your scrollsaw blade through each hole. For a good fit, cut out the tree canopy first, and use it to scribe the mating joints on the tree branches.

2 For a good joint between the hull and the stem and stern, scribe the hull outline on the mating edge of both pieces, and then cut out the stem and stern.



To form left keyhole slot, set left fence 3" from bit, start line 6" from bit, and the stop line 10" from the bit.

Supplies: Waxed paper, #8×1½" flathead wood screws, and finish.



3 Remove the patterns. Dry-fit the parts except the animals, and adjust where necessary to fit.

Start assembling the ark

1 Cover your work surface with waxed paper, and place the background piece on top of it. Spread a light layer of glue on the cabin's back, position it on your background, and clamp to hold the piece in place. Use the Exploded View drawing above and the dashed lines on the patterns to position the pieces. Remove glue squeeze-out with a damp cloth.

2 Apply glue to the ends of the tree limbs; center the canopy around the limbs and hold in place with rubber bands until the glue dries. Now, glue the stem and stern to the hull and clamp.

3 Glue the goose hill and the assembled ark hull to the background. Glue the roof to the cabin. Clamp. After the glue dries, adhere the tree and unicorn hill to the front of the goose hill. Scrollsaw the ramp, trim it to fit where shown, and glue it in place. Clamp.

4 Glue on the animals. To avoid glue smears, apply glue prudently. (Hotmelt adhesive also works.)

5 Apply the finish of your choice. (We left ours unfinished; however, you may want to seal the woods with a clear lacquer.)

6 To mount the ark to the wall, hold it in position over the door and scribe a faint mark along the stem end. Measure in 4" from the mark you just made and 3" up from the top of your door frame. Mark this spot. From that centerpoint,

sure over 22" to locate the second screw-hole centerpoint. Drill ⅛"-pilot holes at these points, and then drive a #8×1½" flathead wood screws into each hole, leaving the heads extended from the wall about ¼". Place the plaque over the screws, and center it by sliding it from side to side. Adjust screw depth if necessary for fit.

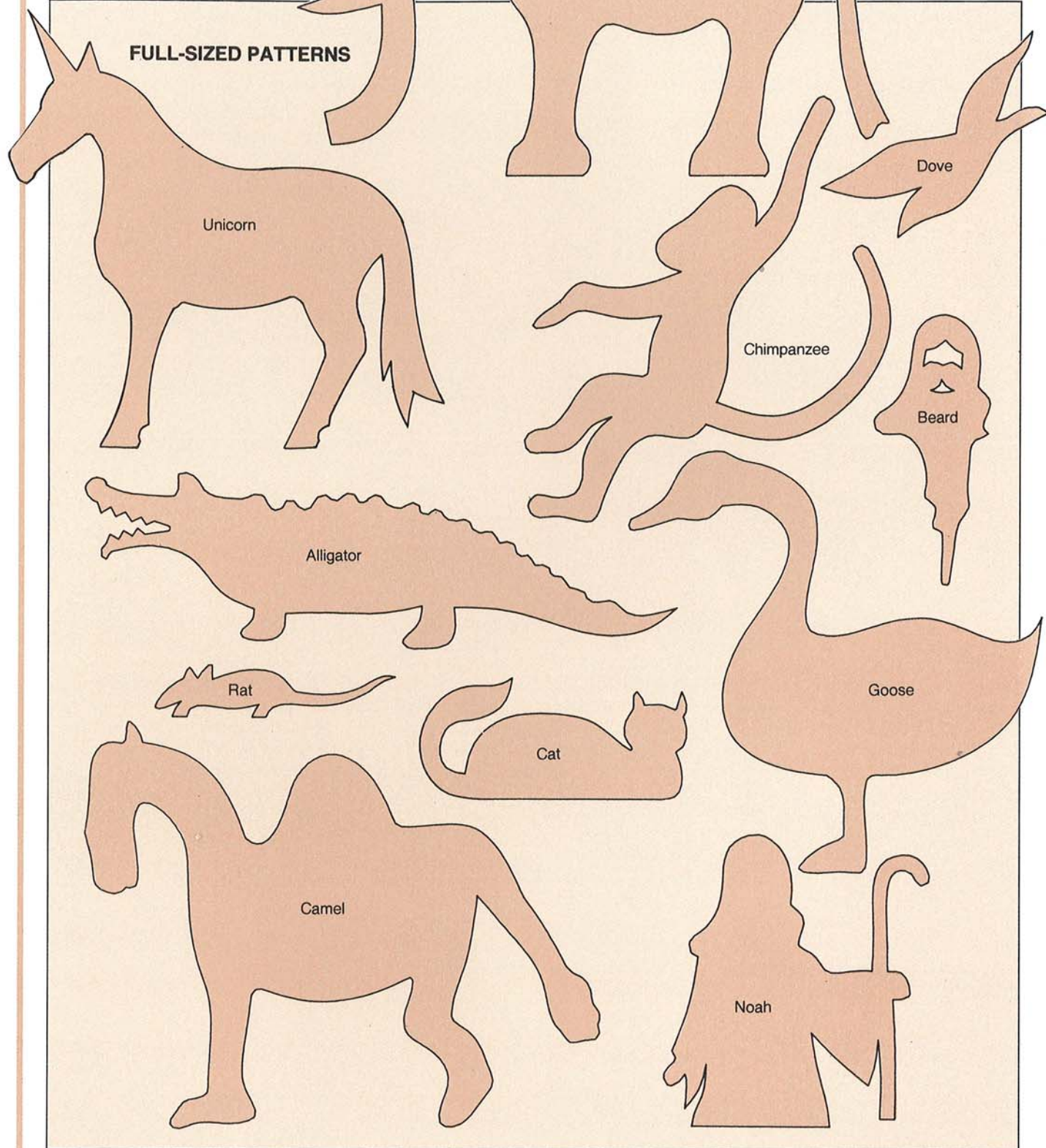
How to order patterns

For full-sized patterns of the ark, send \$1 for handling, and a self-addressed business-sized envelope with 75¢ (U.S.) postage to:
Noah's Ark
Weekend Woodworking Projects
P.O. Box 11022
Des Moines, IA 50336-1022

Continued

Ark-ed doorway

FULL-SIZED PATTERNS





SLENDER SOLUTION

A great-looking way to decorate a narrow space

Start by laying out the board

1 From $\frac{3}{4}$ "-thick stock (we used cherry), rip and crosscut a $4\frac{1}{2} \times 31\frac{3}{4}$ " piece for the scone board (A).

2 On the back of the board, scribe a centerline 7" down from the top, and 6" up from the bottom. Using a try square, extend this centerline over the bottom edge and up the front face about 5". Do the same on the top.

3 Make a full pattern using the Tip half pattern and two copies of the bracket using the Bracket half pattern *opposite*. Adhere the Tip pattern to the board back, aligning the pattern and board centerlines.

4 Use a straightedge or chalk line to connect the bottom corners of the board to the lines on the Tip pattern. Plot the centerpoints for the four screw holes near the bottom as shown *below right*.

5 Chuck a keyhole or dovetail bit in your table-mounted router, and set the bit height. Set up your router table as shown on the Router Setup drawing *opposite bottom*. To rout the slot, place the board between the fences with its back face down. Align the top edge with the start line. Hold the board above the bit, start the router, and gradually lower the board onto the bit. Slowly move the board in the direction shown until the top edge aligns with the stop line. Turn off the router and remove the board. Drill and countersink the shank holes.

6 Prepare the candle brackets by first ripping and crosscutting one piece of $\frac{3}{4}$ " stock to $3\frac{1}{8} \times 10$ ". Lightly scribe a centerline the length of the piece on the back. Next, adhere a Bracket pattern to each end of the piece, aligning the centerlines. Using Forstner or spade bits, bore holes through the centerpoint of B and C as specified. These holes fit candles listed in the Buying Guide.

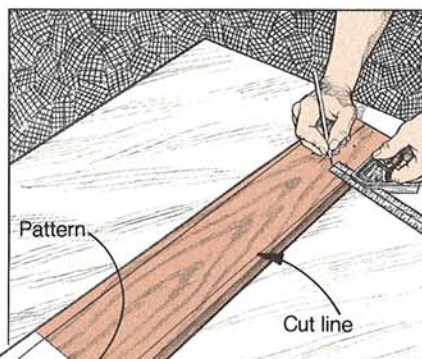
Next, shape the scone

1 Tilt your bandsaw table to 30° from horizontal. Next, place the scone board facedown on the table with the pattern and layout lines visible. Starting at the tip end, saw along the left outline to the bottom corner as shown *below right*, sawing about $\frac{1}{16}$ " wide of the line. Now, turn the piece end for end, and starting at the bottom corner, saw along the line toward the tip.

2 Without changing the table setting, bandsaw the curved side of the brackets. Do not separate the two brackets yet.

3 Tilt the table of your disc sander to match the angle of the beveled scone edges. Now, sand to the cut line, working from the point of the board toward the bottom corner. Use the centerline scribed earlier on the front face to center the point of the bevel as you sand. Sand the beveled edges on the brackets. Crosscut the piece to separate the two brackets.

4 Using the dimensions on the Exploded View drawing, lightly scribe the horizontal lines to locate the two brackets on the scone front. Position the top bracket (B) on the top line. Center it by aligning the pattern's centerline with the centerline on the front. When centered, push an awl through the screw holes in the board and into the bracket to mark the pilot holes. Mark the lower bracket (C). Drill $\frac{3}{32}$ " pilot holes into each bracket.



- 1 Remove the paper patterns from the brackets and the sconce. Next, finish-sand all wood surfaces (including the back), graduating from 150-grit to 220-grit sandpaper.
- 2 Apply your choice of finish.

3 Screw the brackets to the sconce front. (We used #6×1¼" flat-head wood screws.) Hang the sconce. (B)

● **Gentry candle.** Pair of 1¼ x 8" candles. Colors: Black, Bayberry, Dusty Rose, Red, Garnet Red, Jade, Green, Mauve, Plum, Teal, Wine, White, and Ivory. \$16.10 ppd. from A.I. Root, 623 W. Liberty Commons, P.O. Box 706, Medina, OH 44256. Ohio customers add 5.5% sales tax. Check or credit cards. ■

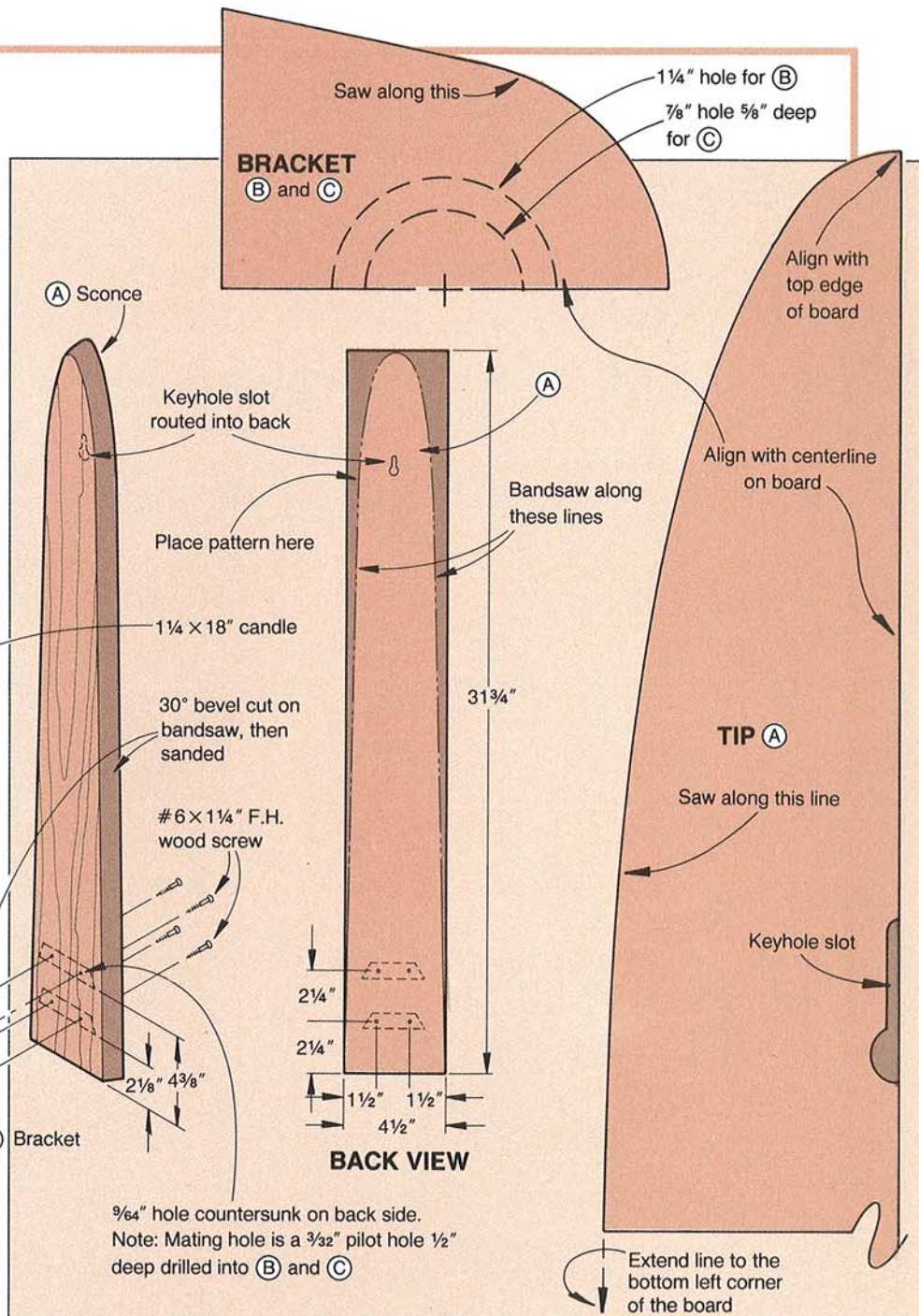
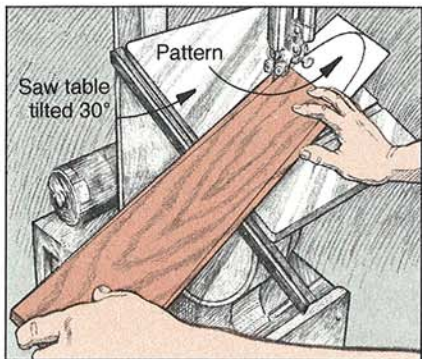


Diagram illustrating the setup for routing a dovetail joint using a router table. The workpiece is positioned against a fence. The distance from the fence to the start line is 5". The distance from the start line to the stop line is 3/4". The distance from the centerline of the bit to the start line is 2 1/4". The distance from the centerline of the bit to the stop line is 2 1/4". The workpiece is fed from the left towards the router bit.

Part	Finished Size			Mtrl.	Qty.
	T	W	L		
A scone board	¾"	4½"	31¾"	C	1
B top bracket	¾"	3⅛"	2½"	C	1
C bottom bracket	¾"	3⅛"	2½"	C	1

Material key: C-cherry
Supplies: #6×1¼" flathead wood screws, candles, finish.

BARBIE'S DREAMWORLD



Make America's favorite fashion doll a bed of her own

Four issues ago, we presented our first bedroom piece scaled for Mattel's popular Barbie® and other 10"- to 13"-tall fashion dolls. From the letters we received, the diminutive armoire was a big hit with readers—and the kids who received them as gifts. Now, it's time to build Barbie and her friends a bed to match the armoire.

We'll cut the parts first

Note: This project requires 1/2"-thick hardwood stock for the bed posts and 1/4" material for the other bed frame parts. As shown on the Cutting diagram at right, we started with a 1/2 × 5 1/2 × 24" piece of stock. After removing the 1/2 × 1/2 × 15" strip for the posts, we planed the remaining piece to 1/4" thick.

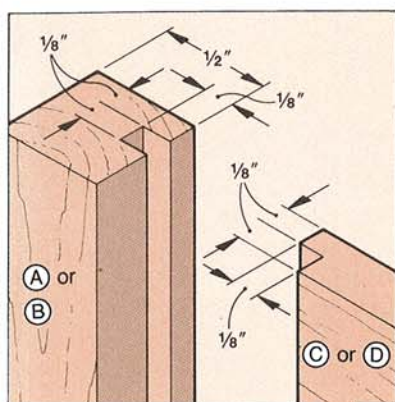
1 Turn the 1/2"-thick piece (we used cherry) on edge, and cut a 1/8"-wide kerf 1/8" deep where dimensioned on the Post detail opposite. Next, set your saw's rip fence 1/2" from the inside of the saw blade and rip the grooved strip from the cherry stock. From this strip, cross-cut two 4" lengths for the head posts (A), and two 3 1/4" lengths for the foot posts (B).

Note: To safely cut the small parts on our tablesaw, we made a wood table insert and elevated the blade up through it. We also used feather boards and a push-stick when ripping thin stock.

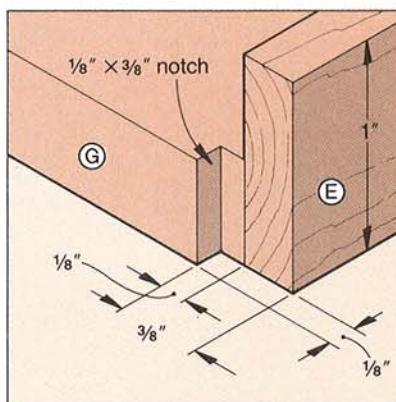
2 From 1/4" cherry, rip and crosscut one 3 3/4 × 7 1/4" piece for the headboard (C), and one 2 1/4 × 7 1/4" piece for the footboard (D). From the same stock, rip and crosscut two 1 × 12 1/4" pieces for the side rails (E). Cut four 3/4 × 3/4" post caps (F). If your planer doesn't dress stock this thin, adhere it with double-faced tape to a larger piece of wood, and pass both through your planer. Or, resaw the stock on a bandsaw or tablesaw.

3 From 1/2" plywood, cut the box spring (G) to the size listed on the Bill of Materials. Now, finish-sand all of the parts, using 150- and 220-grit sandpaper.

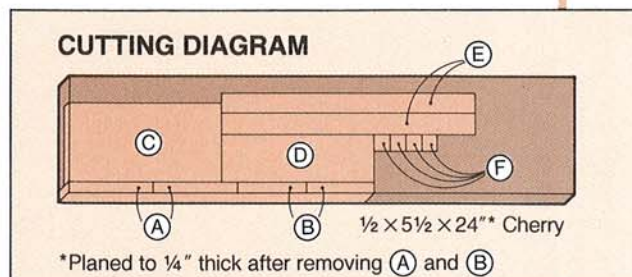
4 Glue and clamp the side rails to the long edges of the box spring, aligning the bottom edges of the rails and the box spring. (We used yellow woodworker's glue.) When dry, lay out a 1/8 × 3/8" notch in each corner for the posts as shown on the Corner detail. Saw the notches.



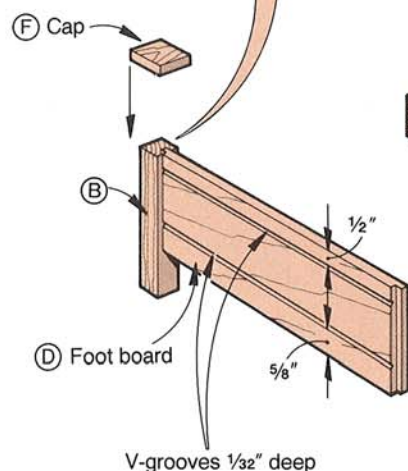
POST DETAIL



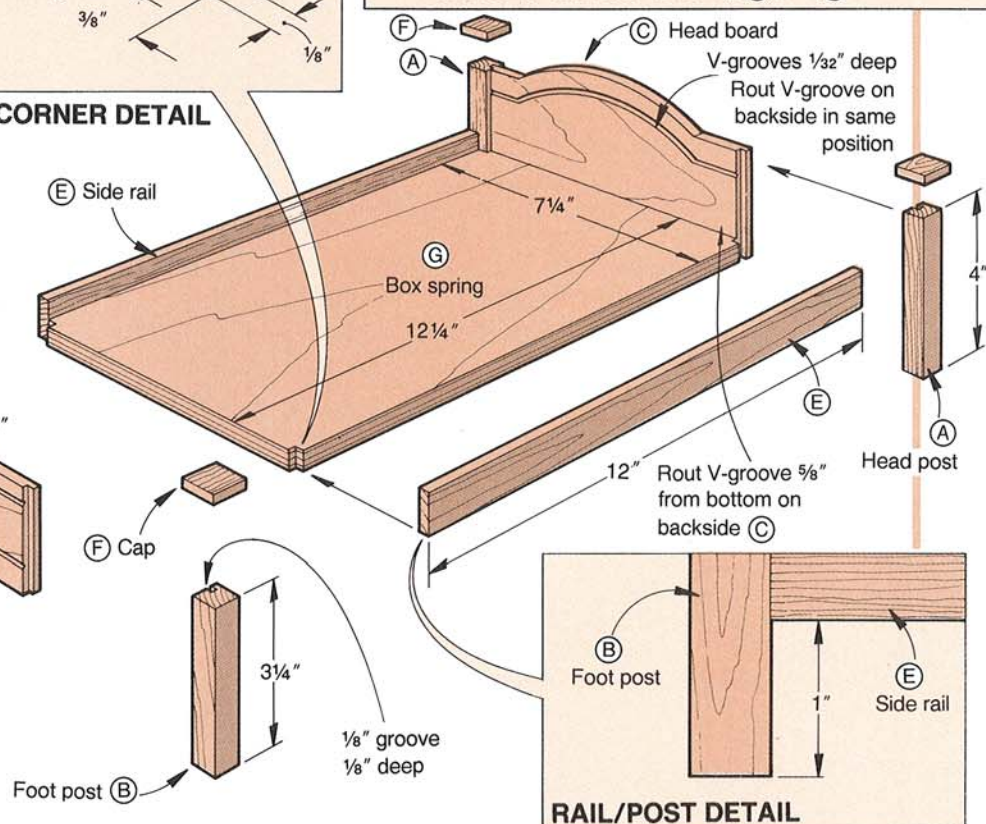
CORNER DETAIL



*Planned to 1/4" thick after removing (A) and (B)



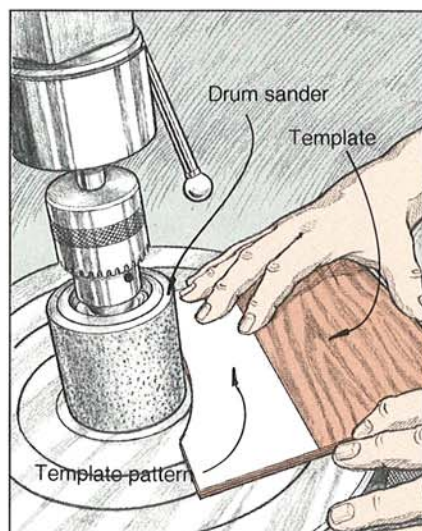
V-grooves 1/32" deep



RAIL/POST DETAIL

Next, shape the headboard

1 Make a copy of the Router Template pattern and Headboard pattern on page 15. (We photocopied ours.) Cut a 4x8" piece of plywood that's slightly thicker than the barrel length of your 3/4" O.D. router bushing. (The barrel on ours measured 9/16" long, so we used 5/8"-thick plywood. For a source of router bushings, see the Buying Guide.) Adhere the Router template pattern to the plywood (we used spray adhesive), aligning it along the front edge and sides. Scrollsaw the curve, cutting just outside the line. Now, sand to the line with a drum sander as shown at right.



Continued

Bill of Materials

Part	Finished Size			Matl.	Qty.
	T	W	L		
A head posts	1/2"	1/2"	4"	C	2
B foot posts	1/2"	1/2"	3 1/4"	C	2
C headboard	1/4"	3 3/4"	7 1/4"	C	1
D footboard	1/4"	2 1/4"	7 1/4"	C	1
E side rail	1/4"	1"	12"	C	2
F cap	1/4"	3/4"	3/4"	C	4
G box spring	1/2"	7 1/4"	12 1/4"	P	1

Material key: C—cherry; P—plywood
Supplies: 1/2 x 7 1/4 x 12 1/4" foam; 9 x 27" fabric for mattress cover, finish.

Doll bed

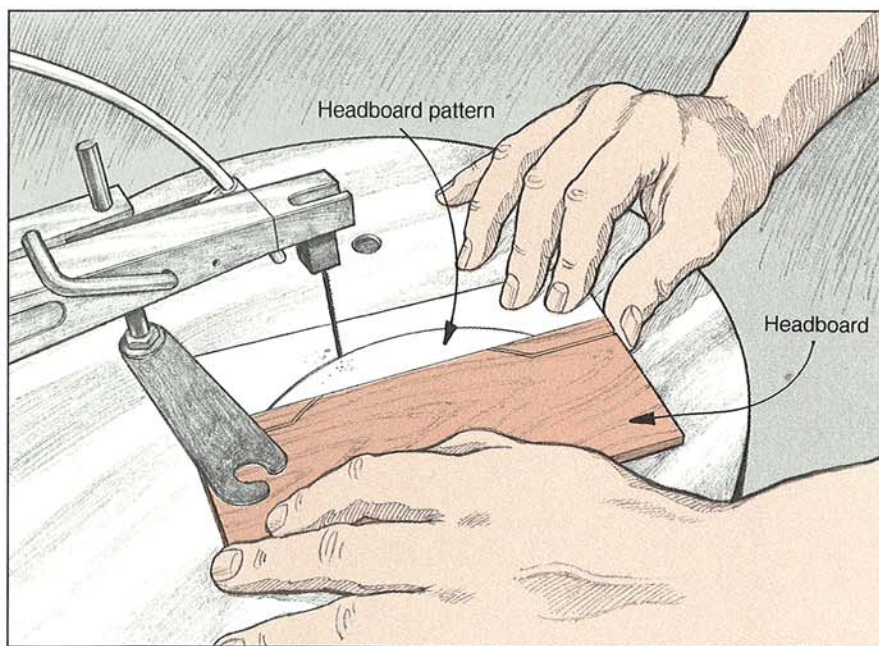
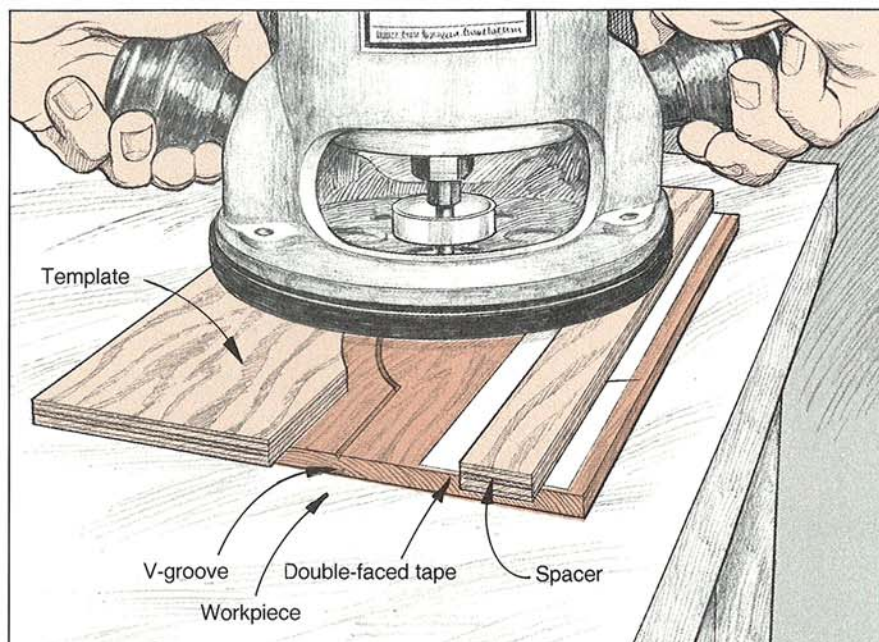
2 Clamp a piece of scrap approximately 12×15" to the top of your workbench, and place the headboard on it. Locate and scribe a faint vertical centerline on the headboard face. Next, position the template on the headboard, aligning the centerline and the front edge of the template 1" down from the top of the headboard. Nail them together where instructed with brads long enough to penetrate into the scrap. If you nail where indicated on the template you'll cut away the nail holes later.

3 Attach a ¾" O.D. router bushing to your router's baseplate and chuck a 60° V-groove bit into the collet. Set the bit depth so it cuts a 1/32"-deep groove. Next, place the router's baseplate on the template, push the bushing against the front edge of the template, and rout from left to right to cut the arched groove as shown *top right*. (With double-faced tape, we placed a 5/8" spacer to the headboard to help support the router.) Remove the template, nail it to the backside of the headboard, and using the same procedures, rout the arching groove on that face.

4 Mount your router in a router table, and using a fence, rout straight grooves where indicated across the front face of the footboard and on the headboard back.

5 With your tablesaw, cut 1/8×1/8" rabbets on the edges of the headboard and footboard where shown on the Exploded View drawing. Next, adhere the headboard pattern to the headboard, and scrollsaw the top to shape as shown at *right*. (We sawed just wide of the line, then sanded to the line.) Remove the pattern.

6 Using the Exploded View drawing for reference, dry-assemble the bed to test the fit of each part. Adjust part dimensions if necessary. Glue the foot posts to the footboard and clamp. Glue and clamp the



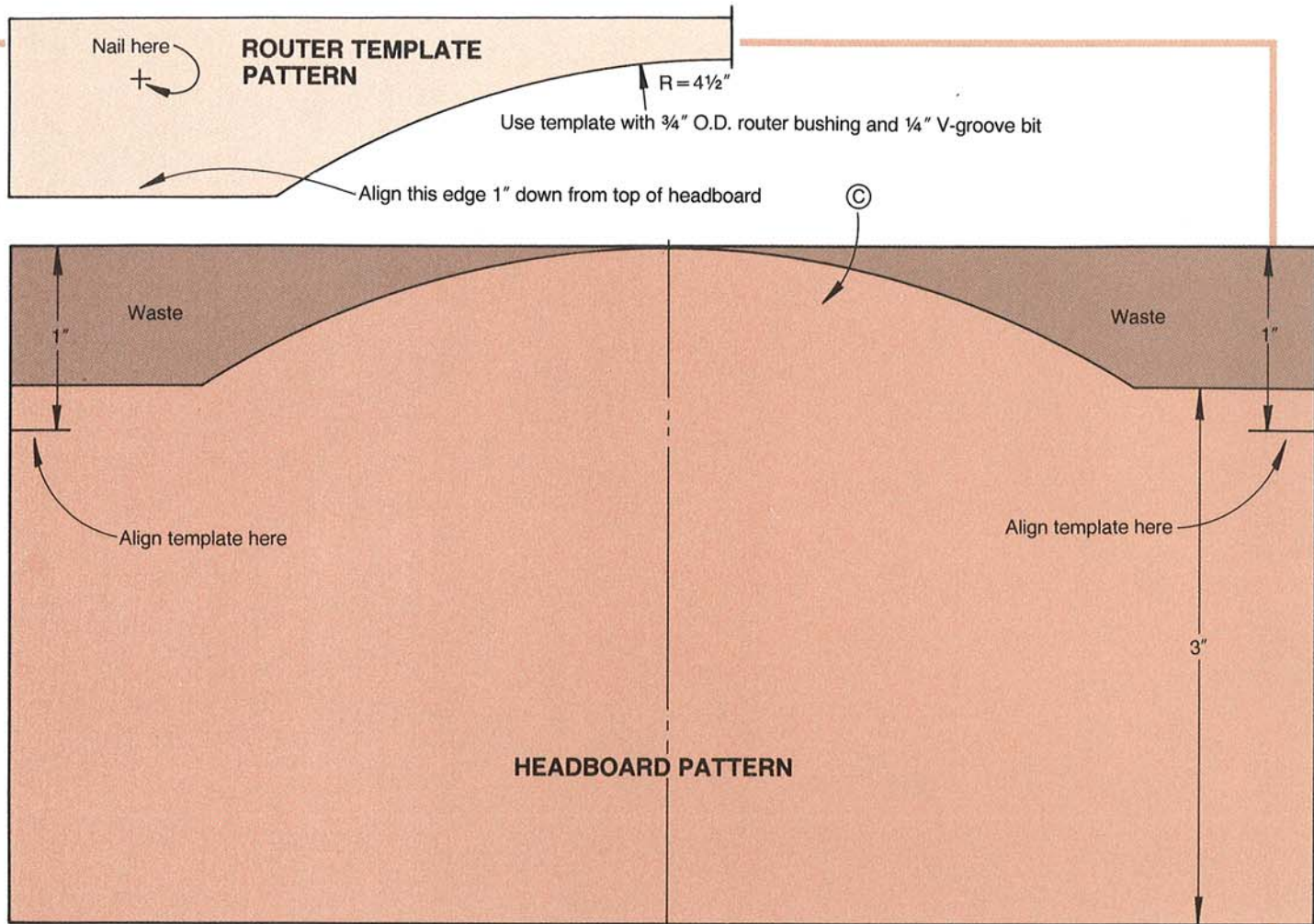
head posts to the headboard. Check the assemblies for square. Wipe off glue squeeze-out with a damp cloth.

7 Glue and clamp the footboard and headboard assemblies to the box spring, aligning the bottom of the box spring flush with the bottom edges of the headboard and

footboard. Check for square. Center and glue a cap to the top of each post, and clamp lightly.

Now, the final touches

1 Apply the finish. (We wiped on a cherry stain and let it dry thoroughly. Next, we applied one



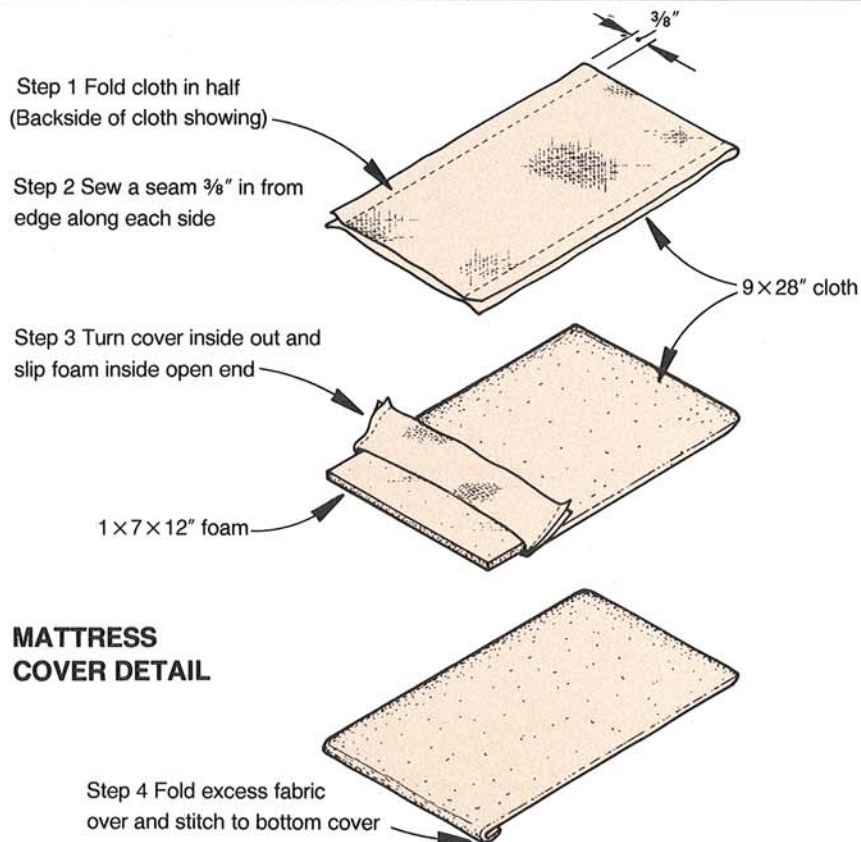
coat of water-based lacquer sanding sealer, and then two coats of water-based lacquer, sanding between coats with 220-grit sandpaper.)

2 For the mattress, cut a piece of 1"-thick foam to fit inside the bed rails. Follow the instructions on the Mattress Cover detail at *right* to sew a cloth mattress cover.

Buying Guide

● **$\frac{3}{4}$ " O.D. Router Bushing.** Fits most routers; adaptors available for others. Bushing, catalog no. 4133, \$5.95. Requires 4C44 lock nut, \$3.50. Add \$4 for shipping and handling. Sales tax required for some states. Woodcraft Supply Corp., P.O. Box 1686, Parkersburg, WV 26102-1686. For telephone orders, call 800-225-1153.

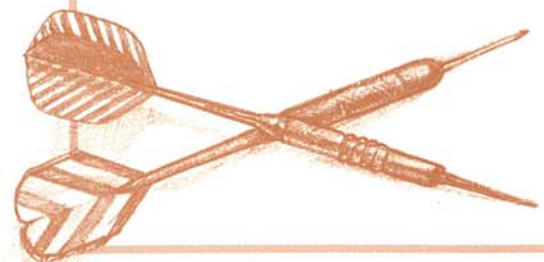
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A wall-hung entertainment center GAME CABINET

An evening of fun can be as close as the rec room with this two-in-one game center. Let the kids toss the rings, and later the adults can throw a few darts. Whether you toss darts or rings, you'll appreciate keeping tally with the easy to use and clean scoreboard inside the right door.



Start with the frame

1 Cut the frame top and bottom (A) and the sides (B) to the dimensions listed in the Bill of Materials *opposite*. (We used beech for the cabinet carcass and doors.)

2 Cut a $\frac{3}{4}$ " rabbet $\frac{3}{8}$ " deep across each end of the side pieces (see the Exploded View drawing *opposite* for additional details).

3 Mark the hinge-mortise locations on both side pieces (B) where shown on the Exploded View drawing. Cut the hinge recesses. (After marking the locations, we mounted a $\frac{3}{4}$ " dado blade to our tablesaw, and raised the dado blade $\frac{3}{32}$ " above the saw table. We then attached an extension to our miter gauge for extra support, and test-cut a hinge mortise in scrap material to verify the correct depth before cutting the mortises.)

4 Glue and clamp the four frame pieces (A, B). Square the assembly. Remove glue squeeze-out with a damp cloth.

5 Rout a $\frac{1}{4}$ " rabbet $\frac{3}{8}$ " deep along the back inside edge of the frame assembly. Square the rounded corners with a sharp chisel.

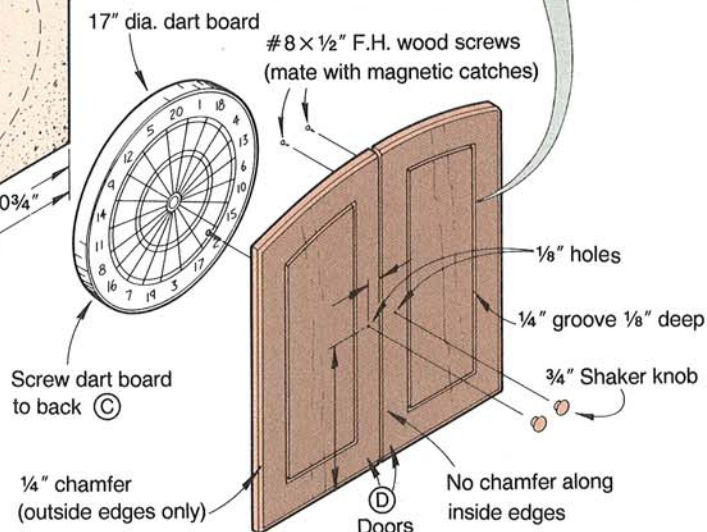
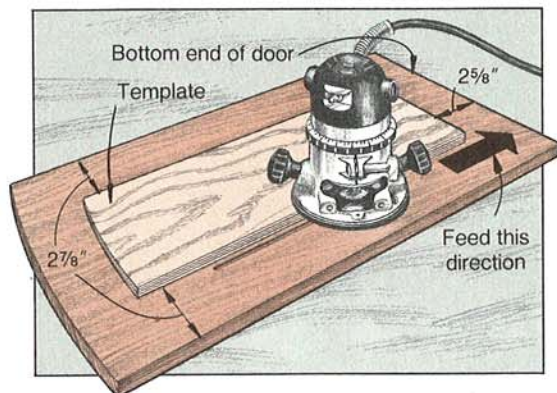
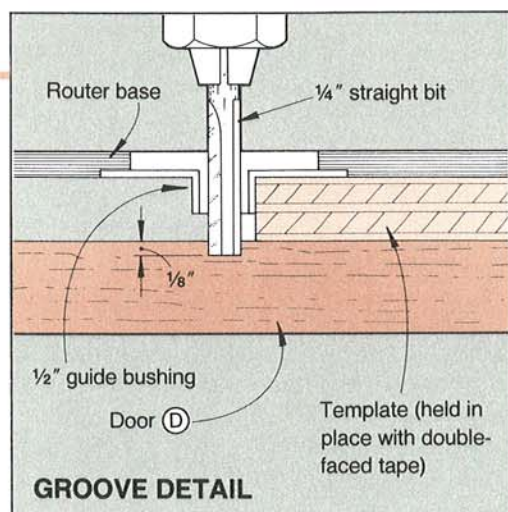
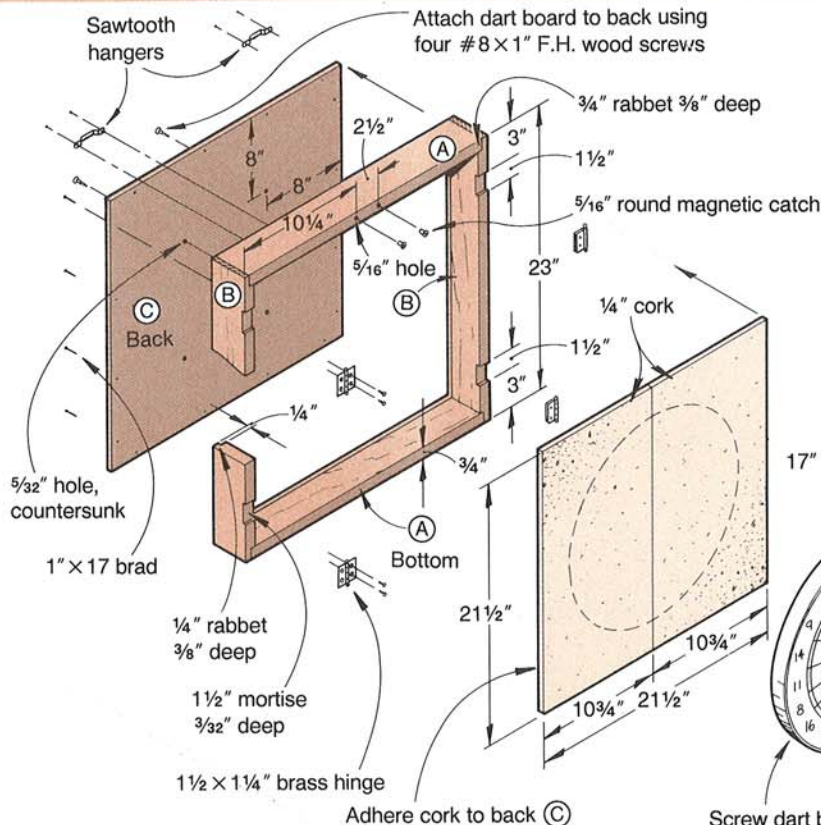
6 Measure the rabbeted opening. Cut the back (C) to fit from $\frac{1}{4}$ " plywood stock.

7 Mark the locations, and drill a pair of $\frac{5}{16}$ " holes $\frac{9}{16}$ " deep in the front edge of the top piece (A) for the round magnetic catches.

Prepare the doors and rout the decorative groove

1 Rip and crosscut the two doors (D) to size from $\frac{3}{4}$ "-thick beech stock. (For economy and stability, we edge-joined pieces of narrower stock to achieve the $11\frac{1}{2}$ " width.)

2 Clamp both doors to your benchtop with the top and bottom edges flush in the configuration shown on the Doors drawing on page 18. Using trammel points, mark a 37 "-radius arc across the door tops (see the Doors drawing).



3 Cut the tops to shape on a band-saw, cutting just outside the marked line. Now, sand to the line to remove the saw marks.

4 To rout the decorative groove in the door fronts, first make a full-sized template pattern using the Door Panel Template drawing on page 19. Next, transfer this pattern to a piece of 1/2 inch plywood, and then cut and sand the template to shape.

5 Position the template on a door front, and trace its location onto the door with a pencil. Remove the template, and place two strips of double-faced tape on the template back. Now, adhere the template to the door where previously marked.

6 Mount a 1/4 inch straight bit and 1/2 inch guide bushing to your router and adjust it as shown on the Groove detail accompanying the Exploded View and the drawing *top right*. Now, hold the router's guide bushing against the edge of the 1/2 inch-thick template, and carefully rout the 1/8 inch groove around the edge of the template. For best results, rout counterclockwise.

7 Remove the template from the door front (we used a wooden wedge). If you find the templates hard to remove, a splash of lacquer thinner under the template will help dissolve the tape's adhesive. Now, flip the template over, and repeat the process in steps 5 and 6 to rout the groove in the front face of the second door.

8 Switch bits, and rout a 1/4 inch chamfer along the front *outside* edges of each door. *Do not* chamfer the mating edges.

Bill of Materials

Parts	Finished Size			Matl.	Qty.
	T	W	L		
A top, bottom	3/4"	3"	22 1/4"	B	2
B side	3/4"	3"	23"	B	2
C back	1/4"	21 1/4"	21 1/4"	P	1
D doors	3/4"	11 1/2"	25"	B	2
E dart holder	3/4"	1"	8 1/2"	B	1
F score board	1/4"	8 1/2"	14 1/2"	H	1

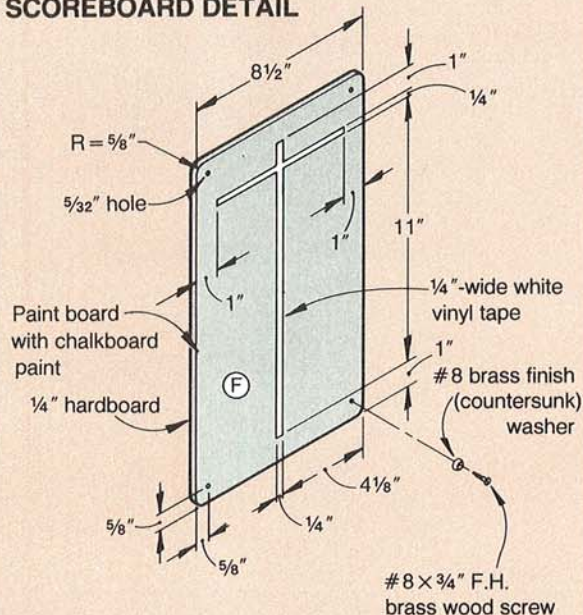
Material Key: B—beech, P—plywood, H—hardboard

Supplies: 17"-dia. dart board, 1" x 17 brads, two pair of 1 1/2 x 1 1/4" brass broad hinges (Stanley CD5302), 13—1 1/2"-long square-bend screw hooks (Stanley 8465-910), 1/4" fine-textured cork, 2—3/8"-round magnetic catches and #8 x 1/2" flathead wood screws, 2—sawtooth hangers, 3/4" Shaker knobs, 2—#8 x 1 1/2" flat-head brass wood screws, 6—finish (countersunk) washers, #8 x 3/4" brass wood screws, #8 x 1" flathead wood screws, stain, finish, green chalkboard paint, white vinyl tape, 3/4" Zi-patone vinyl numerals, rubber jar rings.

Continued

Game cabinet

SCOREBOARD DETAIL



9 Using the dimensions on the Doors drawing, mark the locations, and drill $\frac{1}{16}$ " pilot holes $\frac{1}{2}$ " deep in the back side of the left-hand door for the square-bend screw hooks. Be careful not to drill through the door. Sand the door to remove the pencil marks. Next, mark the knob locations where shown on the Exploded View drawing. Drill a $\frac{1}{8}$ " mounting screw hole through the door for each knob.

Add cork for darts that miss the mark

1 Fit the back piece (C) into the rabbeted opening of the carcase and tape it in place.

2 Cut pieces of $\frac{1}{8}$ "- or $\frac{1}{4}$ "-thick decorative cork to fit neatly inside the frame assembly opening and onto the front face of the cabinet back. (Working carefully, we cut our cork with a sharp utility knife and straightedge.)

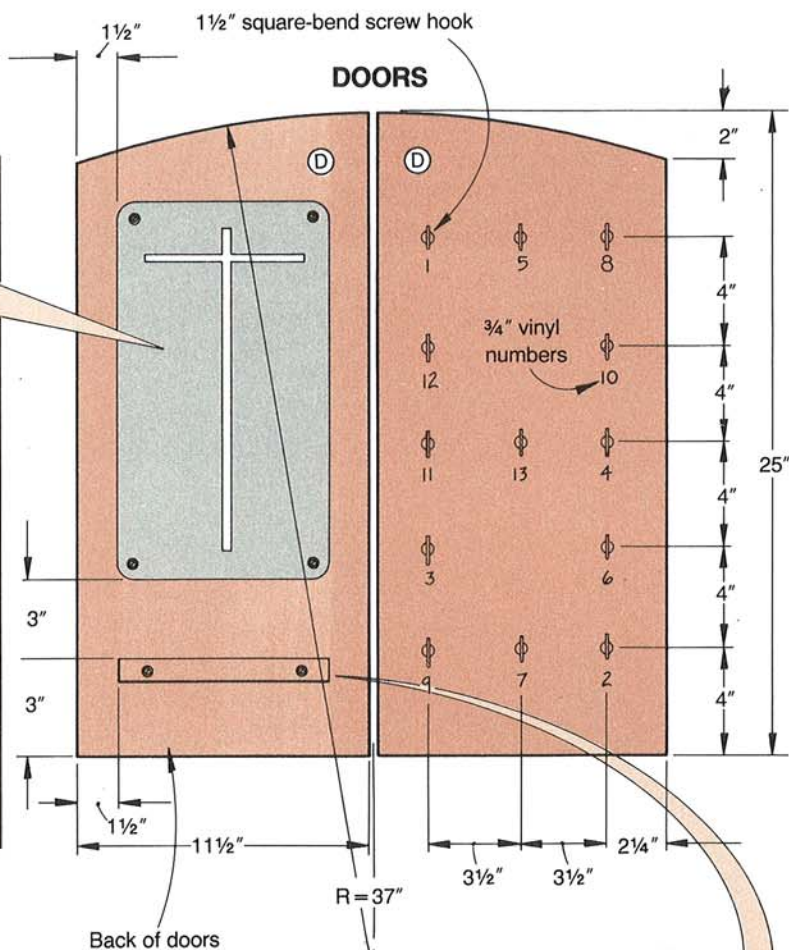
3 Adhere the cork to the plywood back with double-faced tape, hotmelt adhesive, or glue.

4 Using the Exploded View drawing for reference, mark the four hole locations for fastening the dart board to the plywood. Working from the back side, drill and countersink the four $\frac{5}{32}$ " screw holes. Center the dart board in the frame. Now, screw the back to the dart board, and then remove it from the assembly. (We purchased our $\frac{1}{2} \times 17$ " dart board with metal dividers and 6 brass darts at K Mart.)

Add the dart holder and scoreboard

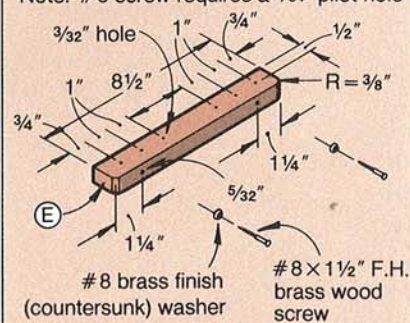
1 Using the dimensions on the Dart Holder detail at right, cut the holder (E) to size. Saw or sand a $\frac{3}{8}$ " radius on the two front corners.

2 Using the same drawing for reference, mark the location, and drill a pair of $\frac{5}{32}$ " mounting holes through the holder edge and six $\frac{3}{32}$ " holes for the darts.



DART HOLDER DETAIL

Note: #8 screw requires a $\frac{7}{64}$ " pilot hole



3 Carefully position and then clamp the dart holder to the inside of the right-hand door. Next, using the previously drilled mounting holes in the holder as guides, drill a pair of $\frac{7}{64}$ " pilot holes $\frac{3}{8}$ " deep into the door back.

4 Cut the scoreboard (F) to size from $\frac{1}{4}$ " hardboard. Mark a $\frac{5}{8}$ " radius at each corner. Cut to shape.

5 Mark the locations, and drill all four mounting holes through the scoreboard. Clamp the scoreboard to the back of the right-hand door. Drill the pilot holes into the inside face of the door but do not attach the scoreboard yet.

Now, sand, finish, and add the hardware

1 Finish-sand the frame, doors, scoreboard, and dart holder. Finish as desired. (We applied two coats of water-based sanding sealer, and sanded lightly after each coat. Next, we applied three coats of water-based satin lacquer, and then sanded with 220-grit sandpaper.)

2 Paint the scoreboard with green chalkboard paint. (We sprayed four light coats to build up the paint surface, and sanded lightly between coats to keep the surface smooth.) After the paint dries, cut two $\frac{1}{4}$ "-wide strips of white vinyl tape and adhere them to the front face where shown on the Scoreboard detail. Attach the scoreboard to the right door with #8 brass finish washers and #8 $\times \frac{3}{4}$ " flathead brass screws. Attach dart holder.

3 Apply self-adhering $\frac{3}{4}$ "-high vinyl numbers to the inside face of the left door in the configuration shown on the Doors drawing. (We used Zippy-Sign $\frac{3}{4}$ " Helvetica numerals by Zipatone; ask for them at art and crafts-supply stores.)

4 Fit the back into the rabbeted frame opening, and secure it to the frame with 1" $\times$ 17 brads. Attach sawtooth hangers to the back.

5 Screw the square-bend screw hooks into the previously drilled holes in the left door. Attach a knob to the front of each door.

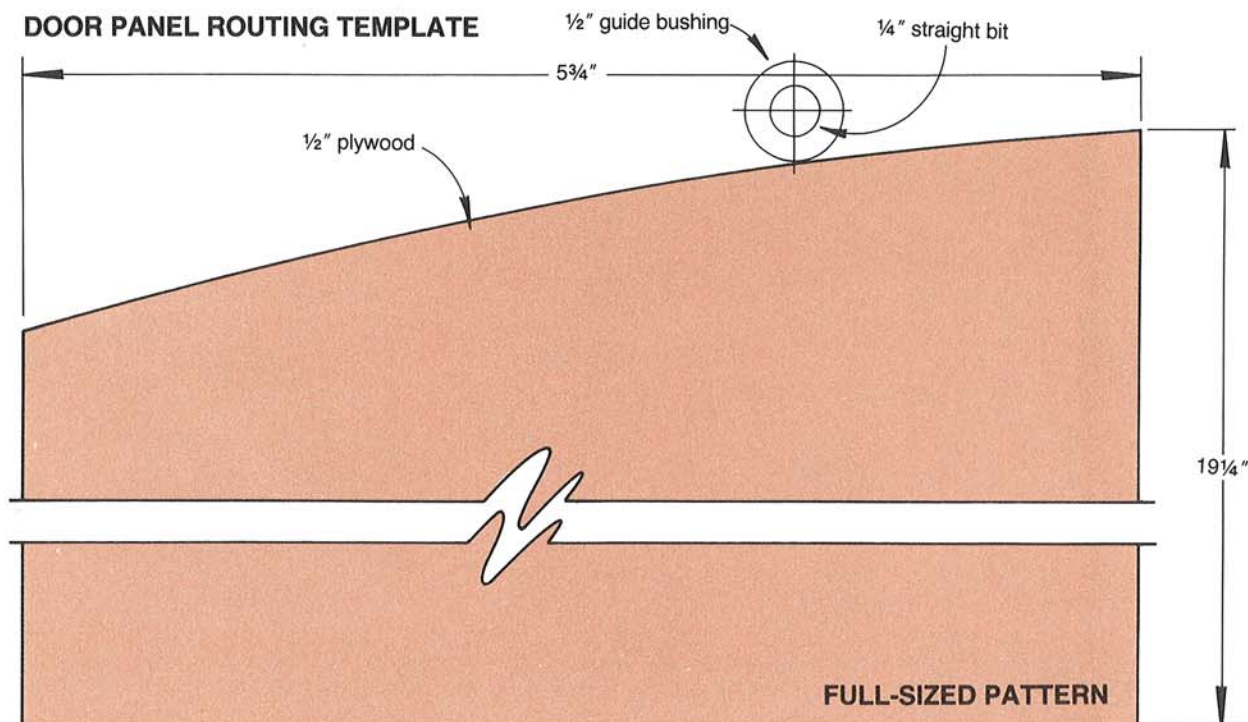
6 Using spring clamps, clamp a long straight board to the dart board bottom piece (A) where shown in the drawing *opposite bottom* to align the doors and cabinet. Using books or scrap pieces of wood as spacers, raise the doors so the top surface of the door lays flush with the bottom surface of the mortise. Now, align the door bottoms flush against this guide board.

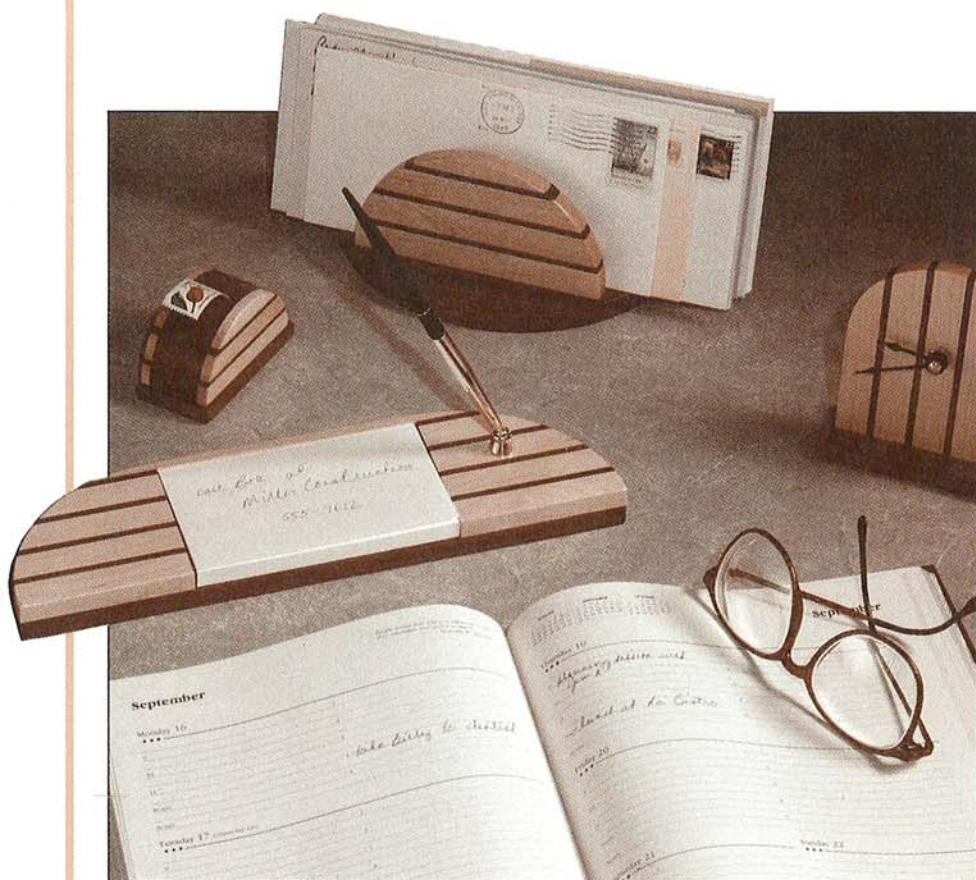
7 Attach the hinges in the frame mortises, and then screw them to the door backs.

8 Insert both round magnetic catches in the holes in the frame top. Next, opposite these magnets, drive #8 $\times \frac{1}{2}$ " flathead wood screws into the inside face of each door to act as strike plates.

9 Mount the cabinet so the bull's-eye center measures 68" from the floor. The throwing or hockey line should be 93 $\frac{1}{4}$ " in front and parallel to the face of the dart board. For the ring-toss game, purchase a box of rubber rings used on quart canning jars. ■

DOOR PANEL ROUTING TEMPLATE





Walnut and maple merge to form
four great impressions

FORTUNE FOUR

Expect a handsome return on investment—of your time—when you incorporate two popular hardwoods into one high-yield design. A careful search of your (wood) stock portfolio could uncover all the resources you need to get started in this business adventure.

Start by assembling all of the laminations

1 To make up the lamination strips, rip and crosscut 10— $\frac{1}{2} \times \frac{5}{8} \times 12\frac{1}{8}$ " maple pieces and eight $\frac{1}{2} \times \frac{1}{8} \times 12\frac{1}{8}$ " walnut pieces.

2 Lay out two laminations with five maple strips alternated with four of the narrow walnut strips in between as shown on the Cutting diagram. Glue and clamp each lamination, as shown *opposite*. (We aligned the pieces at the ends, and clamped a bar across each lamination end to keep all pieces flat while the glue cured.)

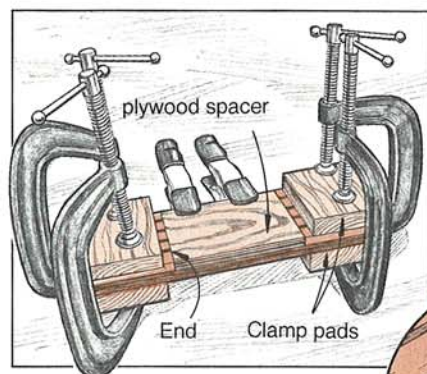
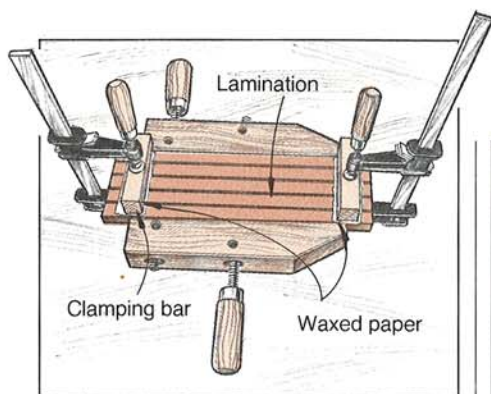
3 Assemble the third, smaller lamination using the three $\frac{7}{16} \times \frac{1}{2} \times 8\frac{1}{2}$ " maple pieces and two $\frac{3}{32} \times \frac{1}{2} \times 8\frac{1}{2}$ " walnut pieces. Now, glue and clamp them, alternating the narrow walnut strips between the maple. After the glue dries, remove the clamps, scrape off the glue squeeze-out from one face, and resaw or plane the piece to $\frac{3}{16}$ " thick. (We used a feather board and pushstick to safely saw this lamination and the other small pieces on our table saw.)

4 Remove the clamps from the two large laminations, and scrape off glue squeeze-out. Next, sand both sides of the laminations, starting with 150-grit sandpaper and ending with 220-grit paper. Now, finish-sand both laminations to $\frac{7}{16}$ " final thickness.

5 Make copies of the full-sized patterns on page 25. (We used carbon paper.) Mark all hole centerpoints on the patterns. Now, separate the patterns. (We used one pattern for parts A and B.)

Let's make the pad and pen holder next

1 With a pencil, transfer the pattern outlines of parts A and B and the hole centerpoint onto the face of one lamination. (We turned the pattern over to trace part A.

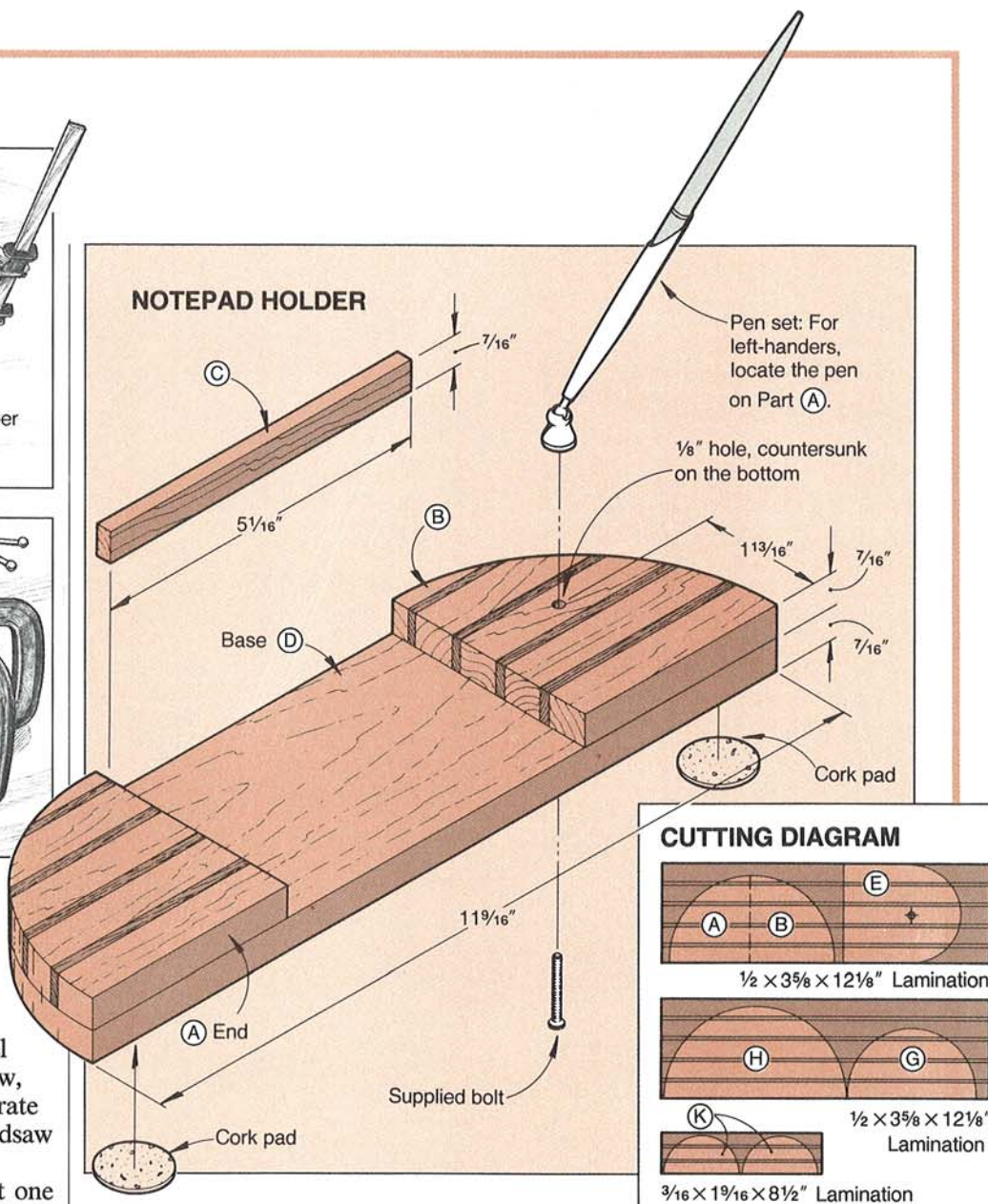


See the Lamination Cutting diagram at far right for how we laid out the parts on the three laminations.) For a left-handed person, consider locating the hole for the pen funnel on part A rather than B. Now, crosscut the lamination to separate parts A and B, but *do not* bandsaw the curved edges yet.

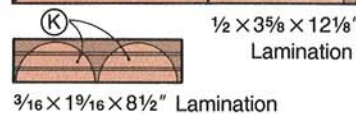
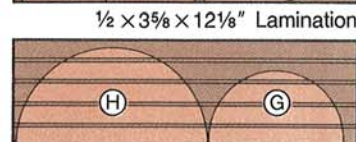
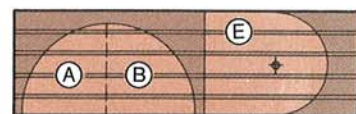
2 For part C, rip and crosscut one maple strip to $\frac{1}{4} \times \frac{7}{16} \times 5\frac{1}{16}$ ", and for the base (D), one walnut piece to $\frac{7}{16} \times 3\frac{1}{4} \times 11\frac{3}{4}$ ". From $\frac{1}{4}$ " plywood, cut a spacer $\frac{1}{16}$ " wider and longer than your notepad. (We designed our holder for 3" x 5" self-stick notepads.)

3 Dry-assemble the holder parts as shown on the Notepad Holder drawing. Align the edges of parts A and B with the front edge of the base. Next, apply double-faced tape to the back of the spacer and position it between A and B. Place part C behind the spacer. Clamp all parts in place. Now, glue A, B, and C parts to the base, and clamp as shown above. Wipe off glue squeeze-out with a damp cloth.

Continued



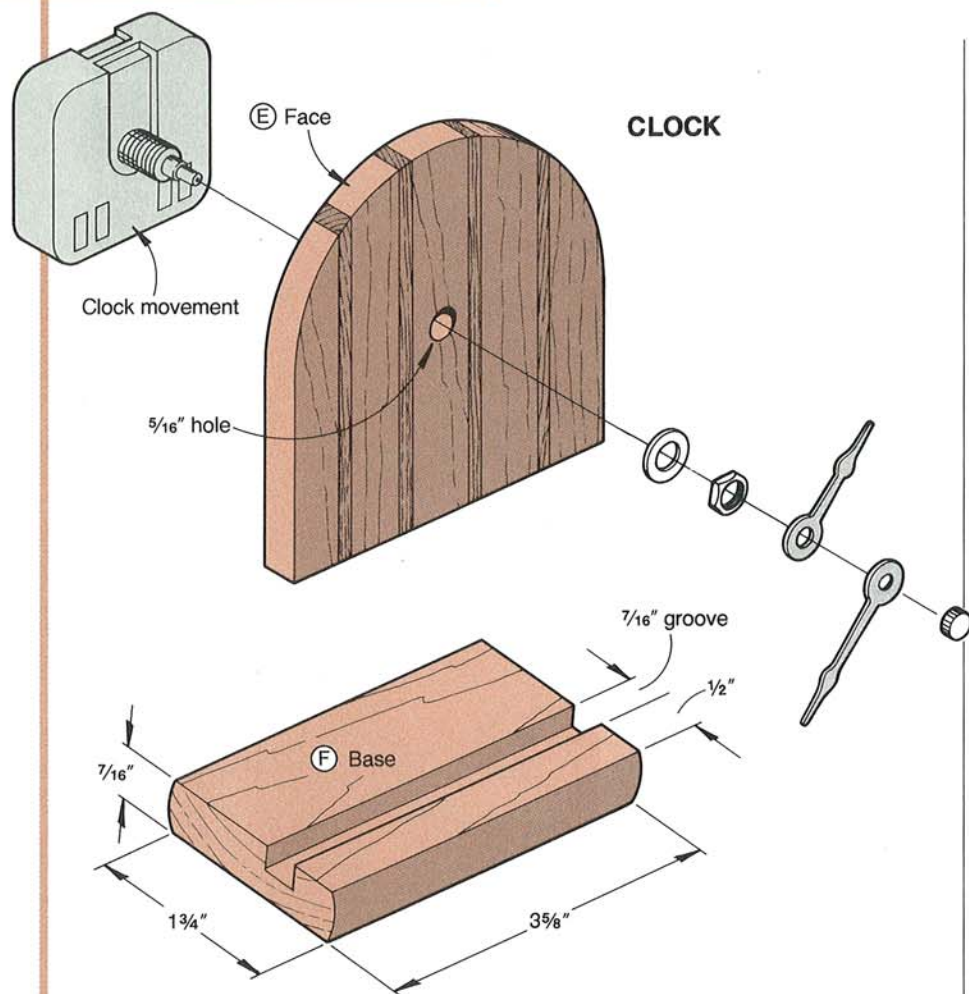
CUTTING DIAGRAM



Bill of Materials

Pen holder						Letter holder					
A* L. end	7/16"	3 1/4"	3 1/4"	L	1	G* front	7/16"	2 5/8"	5 3/8"	L	1
B* R. end	7/16"	3 1/4"	3 1/4"	L	1	H* back	7/16"	3 1/4"	6 1/2"	L	1
C strip	1/4"	7/16"	5 1/16"	M	1	I* base	7/16"	3 3/4"	7 1/2"	W	1
D* base	7/16"	3 1/4"	11 9/16"	W	1	Stamp dispenser					
Clock						J* body	1 1/16"	1 1/2"	3"	W	1
E* face	7/16"	3 5/8"	4 1/4"	L	1	K* side	3/16"	1 1/2"	3"	L	2
F base	7/16"	1 3/4"	3 5/8"	W	1	L base	3/8"	1 5/8"	3 1/4"	W	1
* Parts marked with an * are cut to final size during construction. Please read the instructions before cutting.						Material key: L—lamination; M—maple; W—walnut. Supplies: #6 x 3/4", #6 x 1" F.H. wood screws.					

Desk set



4 Remove the clamps and drill the $\frac{1}{8}$ " hole for the pen's bolt. (See the Buying Guide for our hardware source.) Now, bandsaw and sand the round corners of A and B. (We sawed slightly wide of the line, and then sanded to the curved lines with our disc sander.) Now, finish-sand the holder. See Step 5 on page 24 for finishing information.

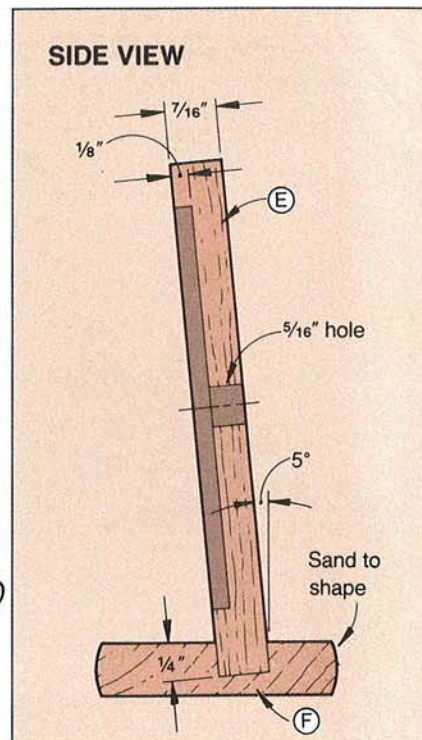
It's time to move on to the clock

1 Trace the Clock Face (E) pattern outline onto the back side of the laminate piece left from parts A and B. (We ran the lamination

vertically.) Mark the hole centerpoint on the back.

2 Center a 3" Forstner bit on the centerpoint, and bore a $\frac{1}{8}$ "-deep hole into the back. Or, make a template and rout the recess with a straight bit. On the same centerpoint, drill a $\frac{5}{16}$ "-diameter hole through the part. (When drilling, we backed the piece with scrap to prevent chip-out.) Now, bandsaw the top to shape, and sand the edge using techniques described earlier.

3 From walnut, rip and crosscut a piece to $\frac{7}{16} \times 1\frac{3}{4} \times 5$ " for the



clock base (F). Mount a $\frac{7}{16}$ " dado on your tablesaw, angle it 5° from perpendicular, and make a test-cut in scrap first to test the fit of the face in the dado. Adjust width if necessary. Next, starting $\frac{1}{2}$ " in from the front edge, cut the $\frac{1}{4}$ "-deep groove lengthwise in the piece. See the Clock Assembly and Side View drawings at left and above for additional details. Now, cut the base to final length, finish-sand both parts, and shape the base edges.

4 Glue the clock face in the base groove. After the glue has cured, assemble the clock as shown on the Clock Assembly drawing. Shorten the hands. (We cut $\frac{1}{4}$ " from each.) Remove the movement and finish.

Try this simple and effective letter holder

1 Transfer the letter-holder front (G) and back (H) patterns to the face of the second lamination. Bandsaw or scrollsaw the curved parts to shape, and sand the cut edges.

2 To form the base (I), rip and crosscut a piece of walnut to $\frac{7}{16} \times 4 \times 8$ ". Find the centerpoint along one edge of the piece and using a compass, scribe a $3\frac{3}{4}$ " radius on the bottom of the base. Next, using the dimensions on the Letter Holder drawing at *right*, locate the centerpoints of the four screw holes. Drill $\frac{9}{64}$ " shank holes where marked and countersink them on the bottom face. Now, bandsaw or scrollsaw the base to shape. Finish-sand the piece.

3 To assemble the letter holder, first apply glue to the bottom of the back (H) and position it on the base. (We ripped a strip of $\frac{1}{16}$ "-thick scrap to space the back on the base, and used a marking gauge to center it $\frac{1}{2}$ " from each end.) Let the glue set for five minutes. Now, turn the assembly upside down and place it's back in a vise. Using the existing holes, drill $\frac{3}{32}$ " pilot holes $\frac{5}{8}$ " deep into the back. Drive a #6 $\times 1$ " flat-head wood screw into each hole.

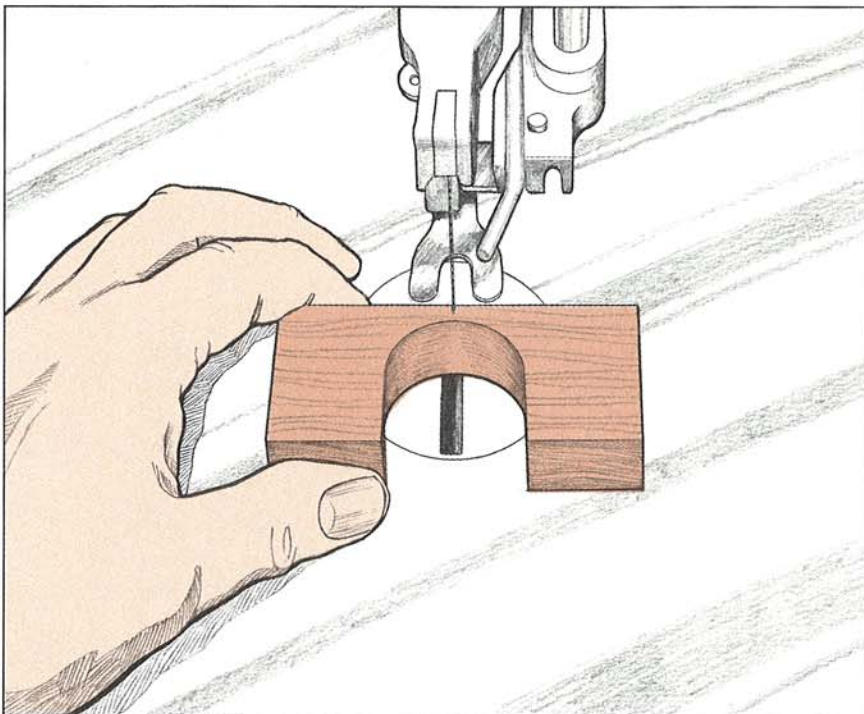
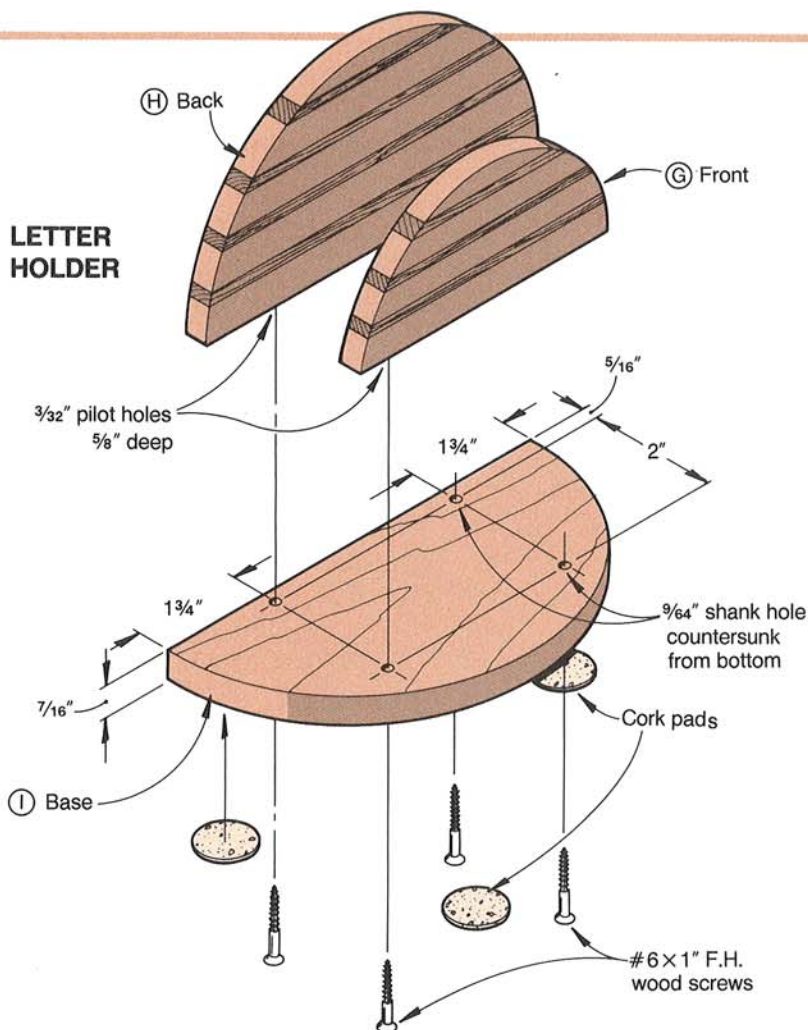
4 From scrap, cut a $1\frac{1}{2}$ "-wide spacer 4" long and place it against the back. Apply glue to the bottom edge of the front piece, place it against the spacer, and center. After the glue sets, drill the pilot holes and drive the screws. Apply finish.

Top off your set with our nifty stamp dispenser

1 Rip and crosscut a walnut piece to $1\frac{1}{16} \times 1\frac{9}{16} \times 4$ " for the stamp-box body (J). Scribe a vertical centerline on one face of the piece and mark a centerpoint $\frac{11}{16}$ " up from the bottom edge as shown on the Stamp Dispenser and Body detail on page 24. From that centerpoint, mark a $\frac{3}{4}$ " radius, and scribe a line from each edge of the radius to the bottom. Remove the U-shaped section. (We first bored a $1\frac{1}{2}$ "-diameter hole through the piece, and then bandsawed along the vertical lines.) Now, saw the body piece in two as shown at *right*.

Continued

LETTER HOLDER



Desk set

2 Crosscut the thin lamination in half. Next, glue and clamp the two body pieces to the face of one of the side pieces (K). Glue and clamp the second side to the walnut body.

3 Transfer the Stamp Dispenser Side pattern to one side of the assembly. Saw the dispenser to shape. Finish-sand the assembly.

4 For the base (L), rip and cross-cut a piece of $\frac{3}{8}$ "-thick walnut to $1\frac{5}{8} \times 3\frac{1}{4}$ ". Mark, drill, and countersink the $\frac{5}{32}$ " shank hole where dimensioned. Finish-sand the base. Now, center the dispenser on the base and mark the pilot hole. Drill the $\frac{3}{32}$ " pilot hole $\frac{1}{2}$ " deep.

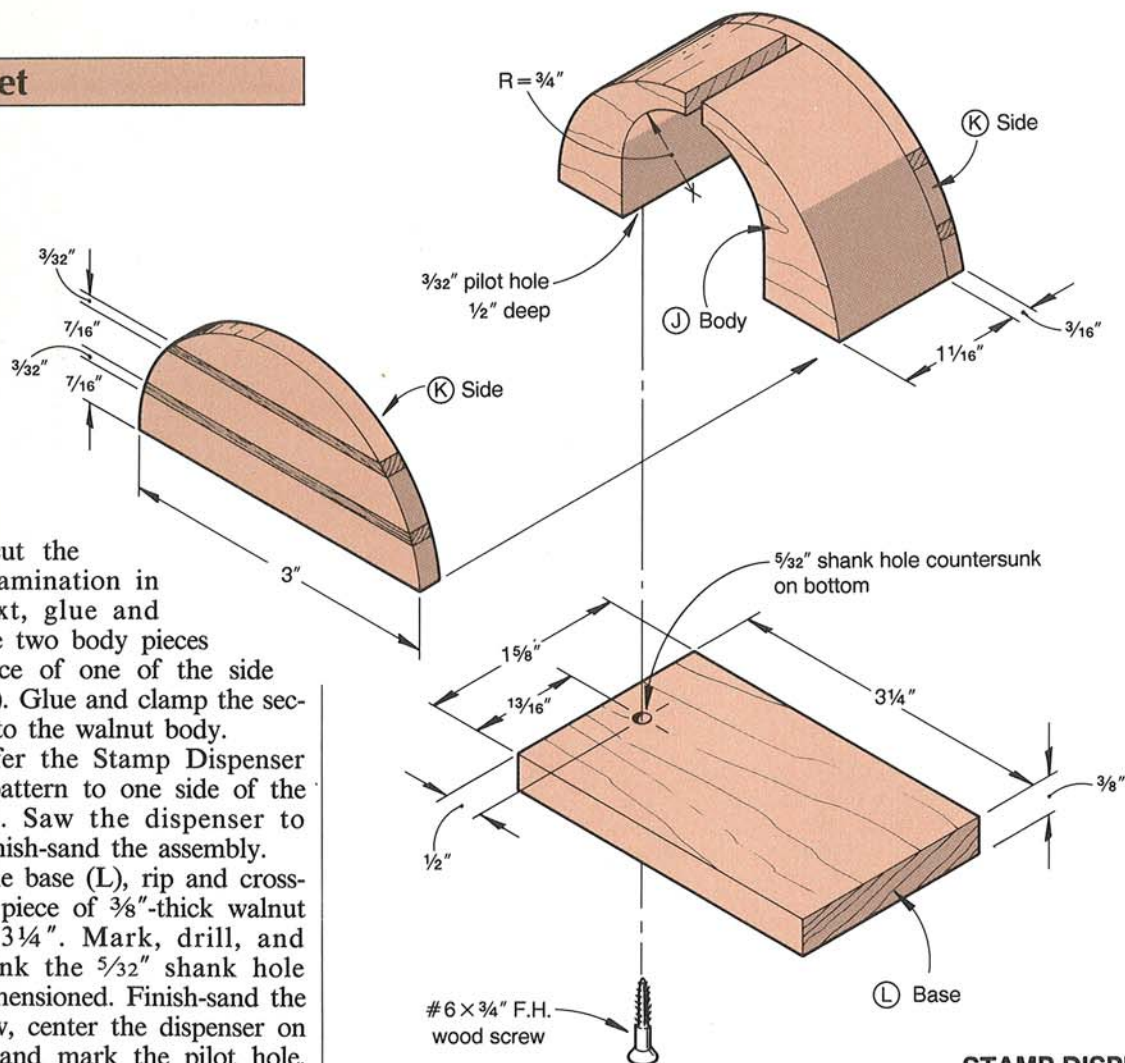
5 Apply the finish of your choice. (We applied one coat of sanding sealer and two coats of lacquer.)

6 Adhere $\frac{1}{2}$ "-diameter cork pads to the base of the letter holder and the notepad holder.

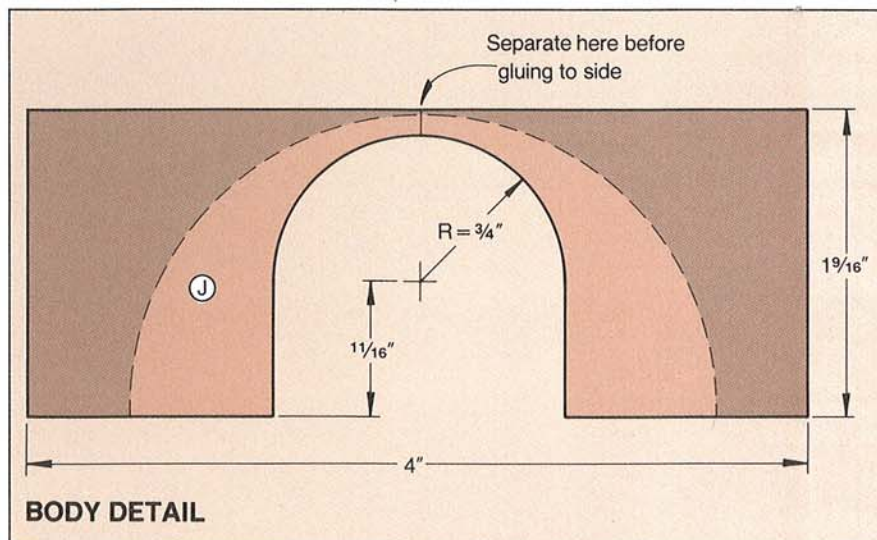
7 Attach the pen funnel to the notepad holder, and then screw the base to the stamp dispenser. Mount the clock works, attach the hands, insert a battery, and set the time.

Buying Guide

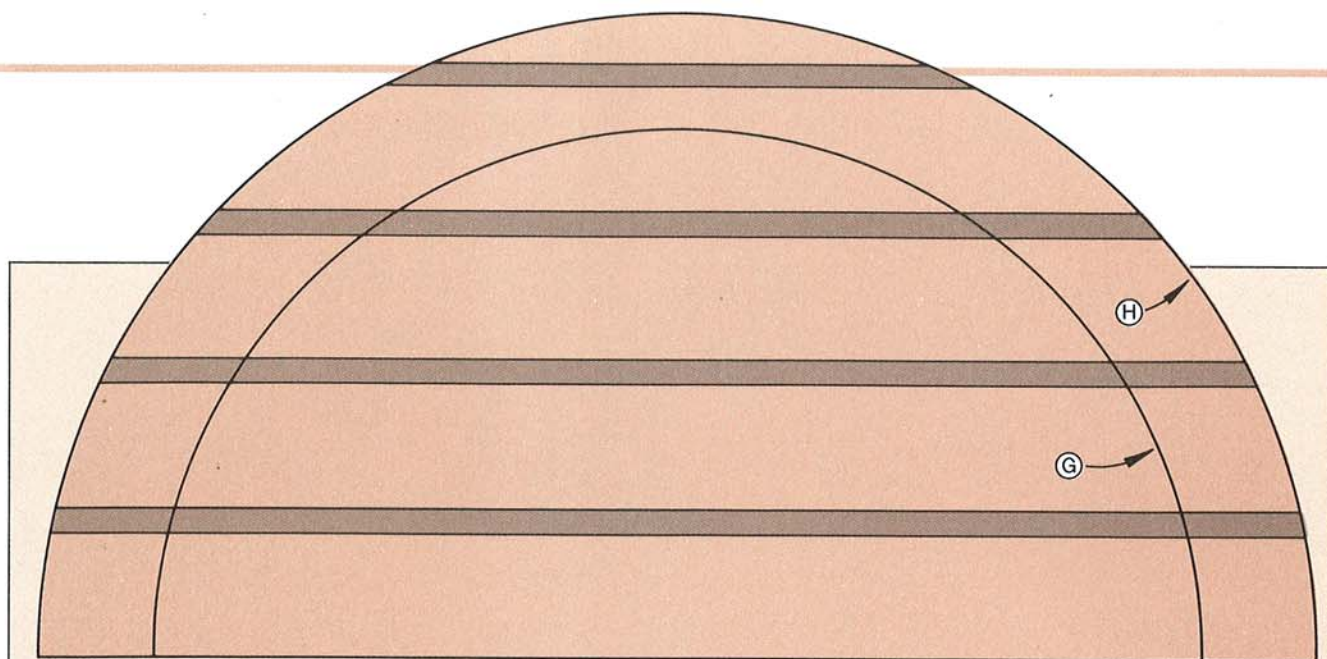
● **Desk kit.** Includes black-matte pen, gold funnel, quartz clock movement, hands, and self-adhesive cork pads. Price \$8.95 per kit plus \$2.50 postage per order. From Schlabaugh & Sons, P.O. Box 327, Kalona, IA 52247. Telephone: 800-346-9663 or 319-656-2374. ■



STAMP DISPENSER

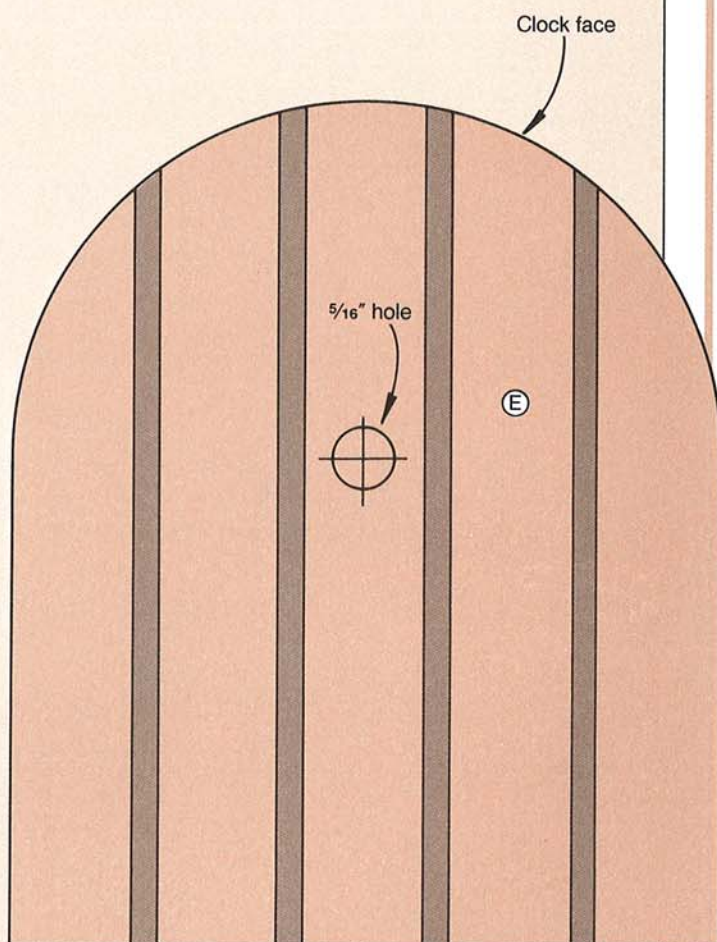
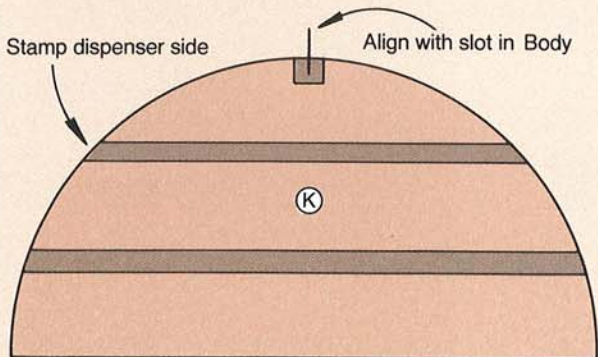
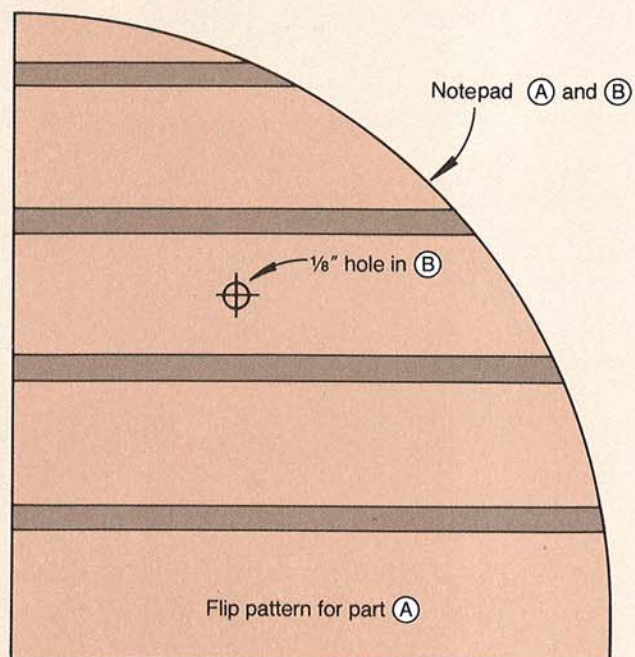


BODY DETAIL



Letter holder (G) and (H)

FULL-SIZED PATTERNS





TERRIFIC TURNED TRIO

One lamination yields three bowls

What happens to the stock inside of most turning projects? Chips, shavings, and more chips. But this efficient project wastes little. And better yet, even a novice woodworker can easily turn our cherry-and-walnut lamination into three handsome bowls.

Prepare the thin stock for laminating

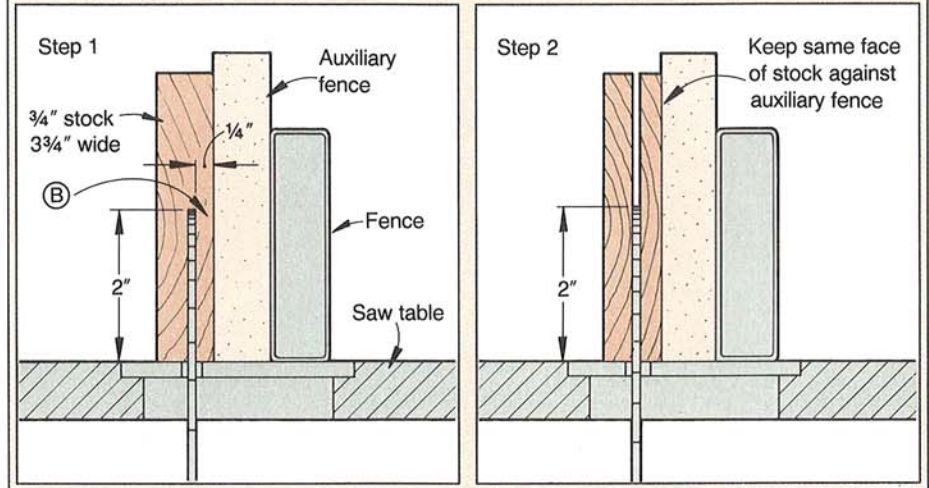
1 To form the 11¼"-square walnut (A) and cherry layers (B) shown in the Bowl Lamination drawing *right center*, rip and cross-cut one piece of ¾"-thick walnut to 3¾" wide by 70" long (or if you prefer, two 35"-long pieces). Rip and crosscut one piece of ¾"-thick cherry to 3¾" wide by 36" long.

2 Resaw the cherry board to obtain two ¼"-thick pieces measuring 3¾" x 36". (The two-step Resaw Setup drawing at *top right* shows how we resawed two ¼"-thick slabs from the ¾"-thick cherry stock.) Plane or resaw the walnut to ½" thick. (To resaw the ¾"-thick walnut, we set the fence ½" from the inside edge of the blade.)

3 Crosscut six 11¼"-long pieces from the walnut stock and six 11¼"-long pieces from the cherry. From ¾" stock, cut four clamp blocks to 1" wide by 12" long.

4 Spread yellow woodworker's glue on the mating edges of three ¼" cherry pieces (enough for one layer). Clamp these three pieces

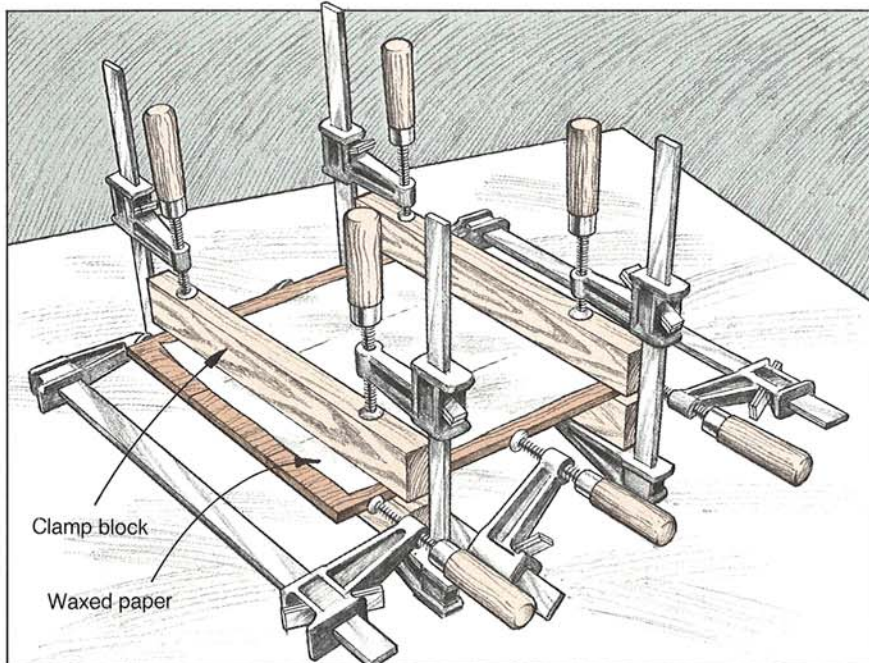
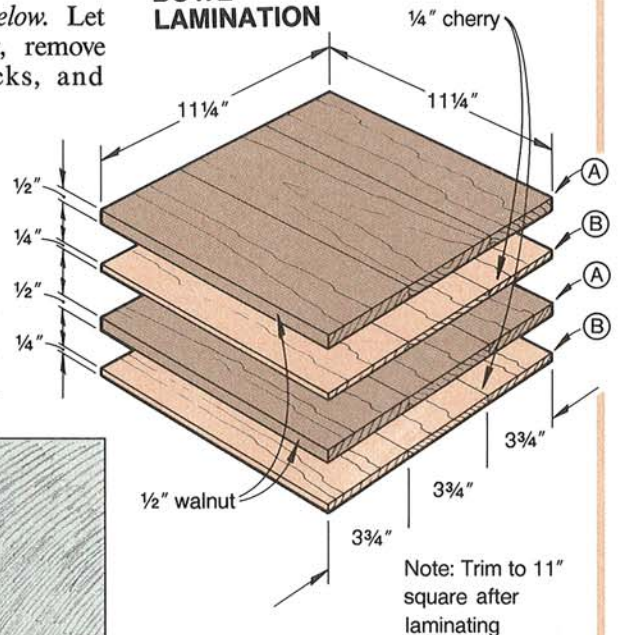
RESAW SETUP



edge to edge as shown *below*. Let glue dry overnight. Later, remove the clamps, clamp blocks, and waxed paper. Carefully scrape off the excess glue. Sand both lamination faces smooth, being careful not to round over the outside edges or sand a depression at the joint lines. Now, form the other three lamination layers the same way.

Continued

BOWL LAMINATION



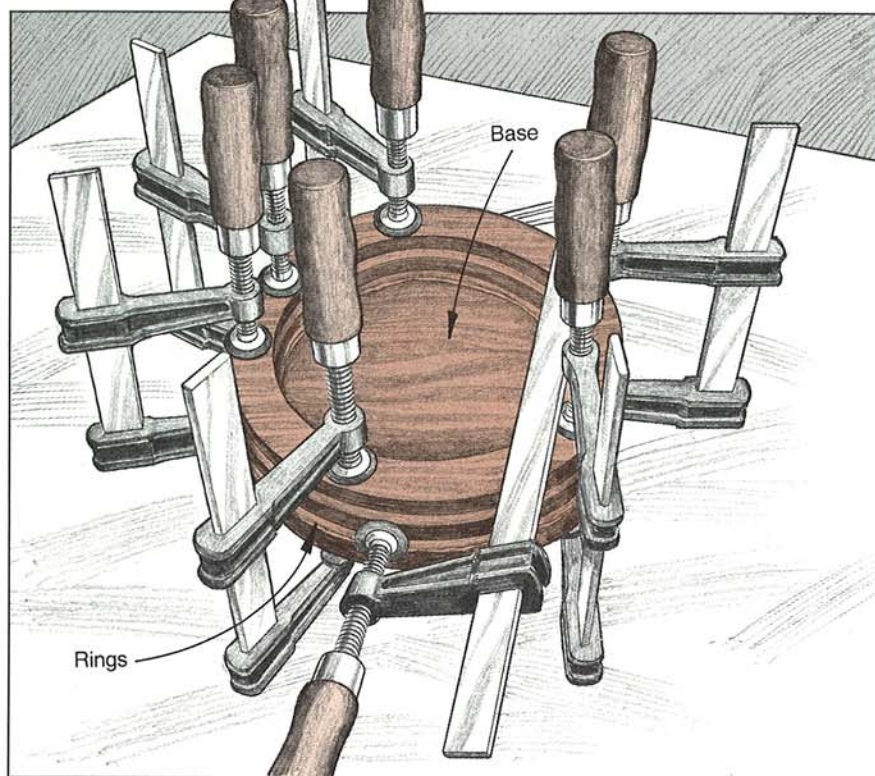
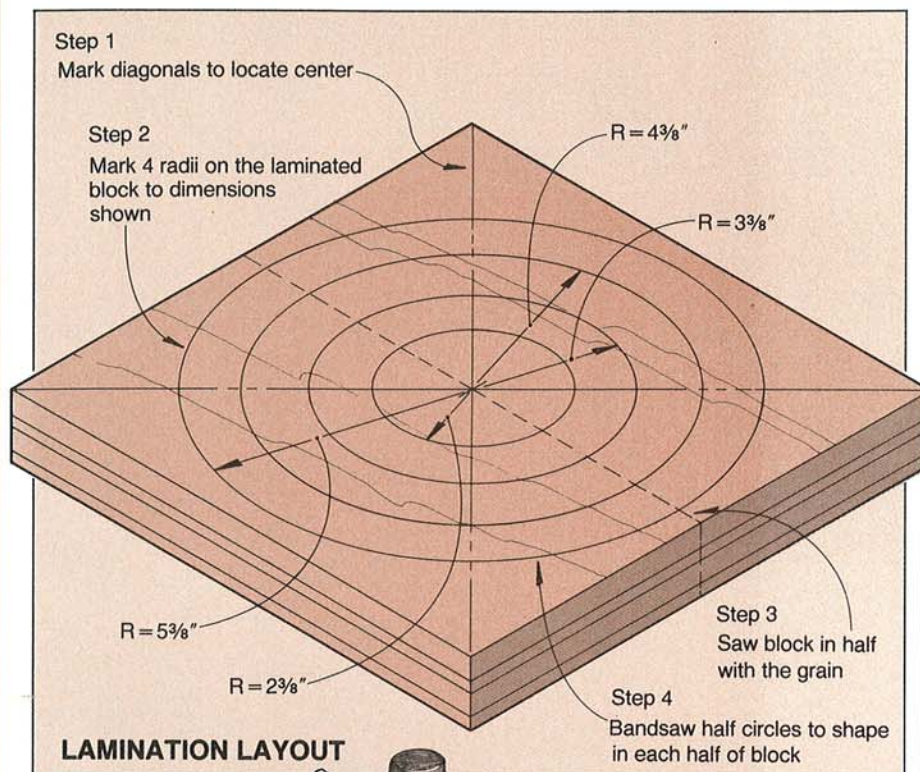
Bill of Materials

Part	Finished Size*			Mtrl.	Qty.
	T	W	L		
A* 1st & 3rd layers	½"	11"	11"	W	2
B* 2nd & 4th layer	¼"	11"	11"	C	2
C* base	¾"	10¾" dia.		W	1
D* base	¾"	8¾" dia.		W	1
E* base	¾"	6¾" dia.		W	1

*Initially cut parts marked with an * oversized as directed in the instructions. Then, trim or turn each to the finished size.

Material Key: W-walnut, C-cherry.

Nesting bowls



Now, ready the bowl blanks for turning

1 First, stack the four pieces in the configuration shown on the Bowl Lamination drawing on page 27. Next, spread a uniform coat of glue on the mating faces of the four layers and restack the pieces in the same order. (We used an old credit card to spread the glue evenly.)

2 Clamp the lamination, aligning the edges and ends. (As shown in the Edge Joining drawing, we used the same clamp blocks to distribute the clamping pressure and to avoid marring the top and bottom pieces with the clamp heads.) Let the lamination set overnight.

3 Remove the clamps, clamp blocks, and waxed paper. Now, trim the lamination to 11" square.

4 Following the four steps on the Lamination Layout drawing at left, scribe the four bowl radii. Next, cut the block in half (with the grain). Now, bandsaw the six half rings to shape, cutting on the lines.

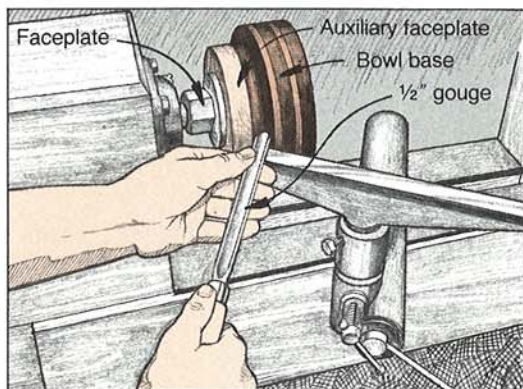
5 To form the $\frac{3}{4}"$ -thick walnut bowl bases, edge-join stock for one 11" square, one 9" square, and one 7" square.

6 Hold the largest half rings together tightly, and mark their circumference on the 11"-square walnut base. Repeat this procedure for the other two bowl bases.

7 Bandsaw the walnut bases to shape. Now, glue and clamp the half rings together and to their mating walnut bases as shown in the drawing at left.

Have fun turning your nesting bowls

1 To make the auxiliary faceplates, scribe a 6", 8", and 10" circle on pieces of 1"-thick stock. (We planed down a 2×12 so we would have plenty of thickness later when parting the bowl from the faceplate. If you use a thinner auxiliary faceplate, you might accidentally strike the mounting screws with the



parting tool when separating the bowl from the faceplate.)

2 Bandsaw the three auxiliary faceplates to shape. Glue the faceplates to the walnut bases.

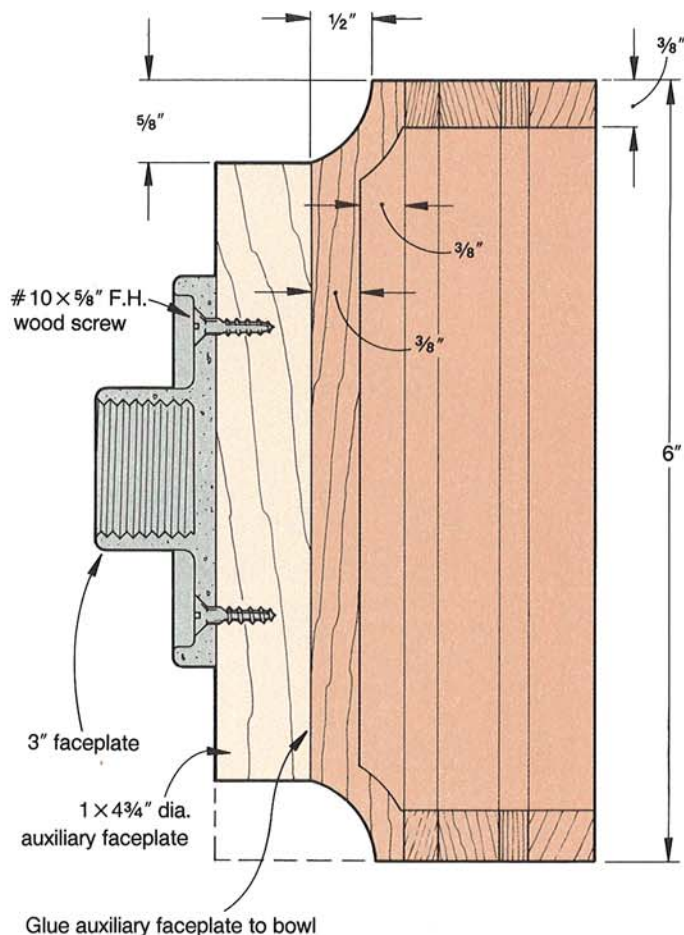
3 Carefully center and screw a 3" faceplate to the auxiliary faceplate for the smallest bowl. See the Shaping the Bowl drawing at right for additional details.

4 Thread this assembly onto your lathe headstock spindle. Using a speed of about 750 rpm, true up the outside bowl surface and faceplate to 6". (We used a 1/2" gouge. Although a scraper would work, we prefer a sharp gouge and a cutting action to minimize tear-out of the end grain.) Turn the bowl-base to shape as shown above.

5 Increase the lathe speed to 1,000 or 1,250 rpm, and hand-sand the bowl exterior smooth with 80-, 100-, and 150-grit sandpaper.

6 To turn the inside of the bowl to shape, reposition the tool rest, decrease the speed to 750 rpm, and reduce the wall thickness to 3/8". (Again, we used a 1/2" gouge.)

7 With a parting tool or 1/4" gouge, turn the contoured corners of the bowl-bottom interior to the shape shown on the Shaping the Bowl drawing. Next, turn the bowl's bottom to 3/8" thick. Be careful you don't cut the bottom too thin or cut through the bowl base. Now, increase the speed and hand-sand the bowl interior.



SHAPING THE BOWL

You're now ready to apply the finish

1 Finish-sand the entire bowl (we used 220-grit paper). With the bowl still mounted on the lathe, apply the finish to the bowl (we brushed on Behlen's Salad Bowl Finish). After the finish has dried, start the lathe and lightly buff the finish with 0000 steel wool. Do not buff through the finish. Apply a second and third coat, buffing lightly between coats with steel wool.

2 Using a parting tool, cut through the auxiliary faceplate (next to the walnut base) and separate the base from the auxiliary faceplate. When making the parting

cut, angle the tool about 3-5° to the right of center to create a slightly concave base. This will prevent the finished bowl from rocking when sitting on a flat surface.

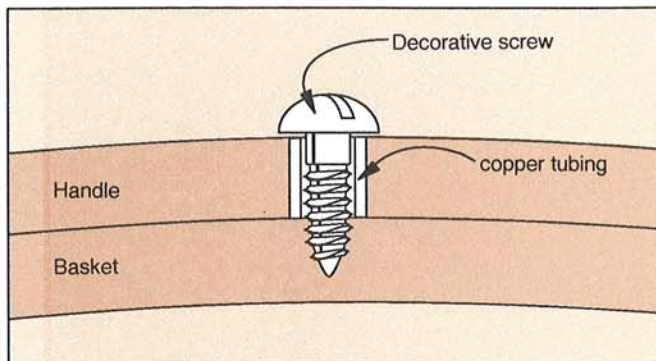
3 Sand the base smooth, sign and date it, and then apply the same finishing material to it.

4 Now, repeat these processes with the two larger bowls using your 6" metal faceplate.

Buying Guide

● **Behlen's Salad Bowl Finish.** One pint, \$9 ppd. (\$12 U.S. funds for Canadian orders), catalog no. 85006, Armor Products, Box 445, East Northport, NY 11731. ■

READER'S CORNER



Because this is your magazine, it's important that you have an opportunity to sound off. Here, you can register your suggestions, criticisms, and if you wish, a kind word. We may not be able to publish every letter, but we'll get in what we can. Send your letters to:

Reader's Corner
Weekend Woodworking Projects
1912 Grand Ave.
Des Moines, IA 50309

Catching up on projects

● If you're planning to build our country clock (Issue 20, pages 6-9), make an additional notation to Step 4 on page 6 to rout the $\frac{1}{4}$ " round-over along *both the outside and inside edges* of the side pieces, not just the outside edge. You will still need to round over the edges of the shelves after assembly.

● Several scoop-chair builders (Issue 20, pages 12-13) have called to point out that the oak stock described in Step 1 on page 12 and shown on the Cutting Diagram must be at least 8" wide in order to cut five $1\frac{1}{2}$ "-wide pieces from it. Also, drill the Flexbolt holes $\frac{5}{8}$ " from the bottom as dimensioned on the Drilling detail.

● If building the gateleg table (Issue 20), cut the spacers (E) $\frac{3}{8}$ " thick as correctly shown in the drawing—not $\frac{1}{2}$ " thick as specified in Step 3 on page 20.

● Party-time cart builders (Issue 21), please change the wheel dimension (Step 4, page 9; Step 5, page 9) to 10" diameter (5" radius) as correctly shown in the Exploded View drawing.

A trouble-free hinge for bandsawed baskets.

I have made more than 30 of your bandsawed baskets (Issue 5, September 1989) but ran into trouble with the toy axle peg hinges. With my baskets, the handles sometimes came loose after opening and closing them a number of times. To solve this problem, I drilled $\frac{3}{16}$ " holes rather than $\frac{7}{32}$ " holes through the handles. Next, I make bushings by hacksawing lengths of $\frac{3}{16}$ " O.D. copper tubing to the same thickness as the handle. I inserted these bushings into the handle holes, drilled them out with a $\frac{9}{64}$ " bit, and then attached the handle to each side with an ornamental screw. So far, I've not had any of these handles come loose.

—Glenn W. Martin, Fairfield Bay, Arkansas

Glenn, thanks for suggesting the hinge bushing—it certainly should make the project more durable. We're including a sketch of your bushing modification so other Weekend Woodworking Projects readers may adapt it to their baskets.

No bolo tie need apply. If you don't like the idea of finishing the turned telephone (Issue 18) with cloth-covered electrical wire or woven bolo ties, then check out this information. Readers Ron and Mary Knappen inform us that their firm, Phoneco, Inc., can supply genuine telephone cord wire for 29¢ a foot plus shipping. And, judging by the 32-page catalog Mary sent along, they can supply you with just about any telephone part you'd want—new or antique.

You can contact the Knappens at P.O. Box 70, Galesville, WI 54630, or telephone 608/582-4124.

Frames by the bundle. Where were you eight years ago when I started making frames out of chair-rail molding? I sure could have used a few pointers and saved myself a lot of time. The frames I make now cost me less than \$3 for materials and barely 45 minutes of my time.

You might suggest to readers that they find out who has the contract to haul off the short pieces from local millwork shops. I am able to buy bundles of six pieces in 48" lengths for \$1 and sometimes even less.

—Donald McMurry, Edgewood, New Mexico

Don, on behalf of the readers, thanks for your tip. We applaud your resourcefulness—and all efforts to utilize materials that might be burned as waste. At the same time, you lower the cost of our favorite pastime.

Homerun idea for little slugger project. In your Big-League Organizer project in Issue 20, you say to transfer the "LITTLE SLUGGER" letters to cardboard, cut them out, outline them in pencil and paint them. Why not suggest, as an alternative, to use rub-on transfer letters?

—David W. Peterson, Jacksonville, Florida

Great idea! Rub-on transfer letters save a lot of time. We checked at a local arts-supply store and found that Letraset 96-point Futura Bold (#29-96-CN) would be ideal. A set of capital letters costs about \$14.