

VOL.6 NO. 3 • ISSUE 33

WEEKEND WOODWORKING

PROJECTS

NEAT THINGS YOU CAN BUILD IN A HURRY

Please display until May 3

Gracious Garden Arbor

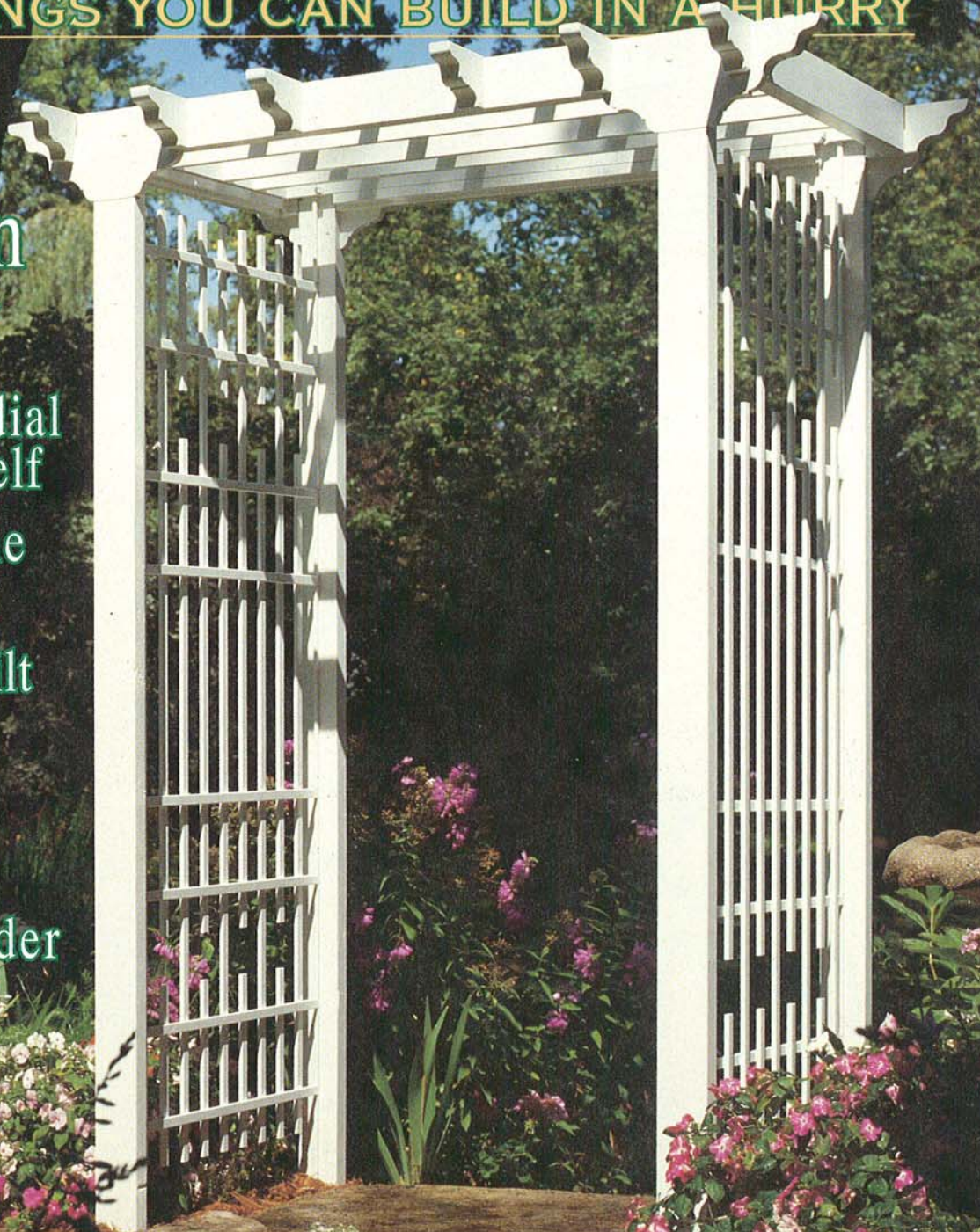
Country-cordial
welcome shelf

Slumbertime
music box

Hanging quilt
coasters

Mission
coat tree

Hook 'n' ladder
fire truck



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FROM THE EDITORS OF WOOD MAGAZINE



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And now she wants her own workbench, too



Photograph: John Hetherington

Louise Anderson and her teacher, Jim Boelling

Around our office, everyone enjoys woodworking—and that includes Louise Anderson, our Administrative Assistant. Louise spends most of her day directing phone calls, organizing our financial records, and providing top-notch reader service for pattern requests, back issues, and so forth. But when lunchtime rolls around, there's a good chance she'll spend her time making sawdust.

Lucky Louise. Just 15 steps from her desk is one of the nicest shops you could imagine. That's where her mentor, Jim Boelling, hangs his apron. Jim has the enviable job of project builder for *WOOD*® magazine. And in his spare time, he has designed a dozen projects for *Weekend Woodworking Projects*® and has built countless others for us. (You're gonna love the leaf-shaped jewelry box Jim created for our next issue—it's a honey of a bandsaw project.)

Jim generously shares his domain and knowledge with Louise and other employees. Recently under his watchful eye, Louise built three heart-shaped jewelry boxes with music movements and four additional bandsaw boxes as Christmas gifts. In fact, Louise spent so much time in the shop in November and December that she asked Jim if she could have her own workbench!

Louise pours a lot of detail into her projects. And now her appreciative family has picked up that familiar refrain, "What are you going to make next year?"

Carl Voss

Cover photograph: John Hetherington

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

WE CARE!

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MPA



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COUNTRY-CORDIAL WELCOME SHELF

With this inviting project hanging in your entry, friends and relatives receive a warm greeting and a chance to admire your curios. Our full-sized letter patterns (shown on page 9) will save you lots of shop time.

10

GRACIOUS GARDEN ARBOR

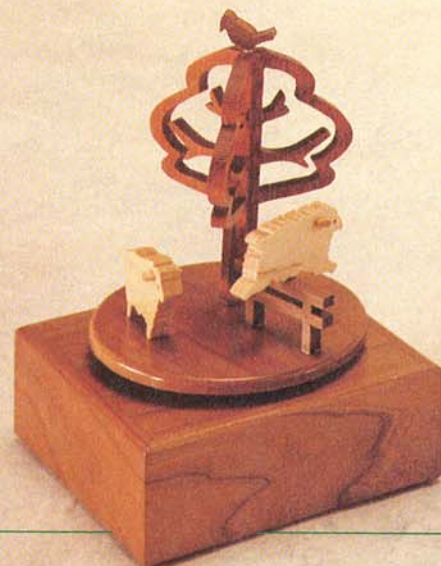
Have a bloomin' good time building a new gateway to your garden. And if the ravages of winter concern you, we've designed the arbor in three parts for easy storage.



15

SLUMBERTIME MUSIC BOX

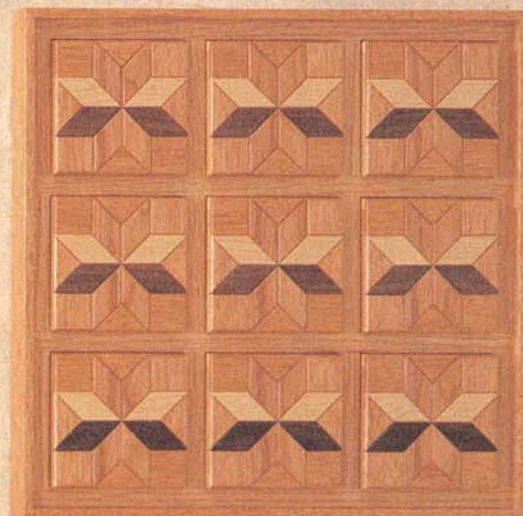
Talk about a great baby gift! First, assemble the simple box to hide the music movement. Next, scrollsaw and arrange the figures from our full-sized patterns. Then, crank the turntable clockwise and watch the sheep slowly revolve to the sound of Brahms' *Lullaby*.



18

CAPTIVATING QUILT COASTERS

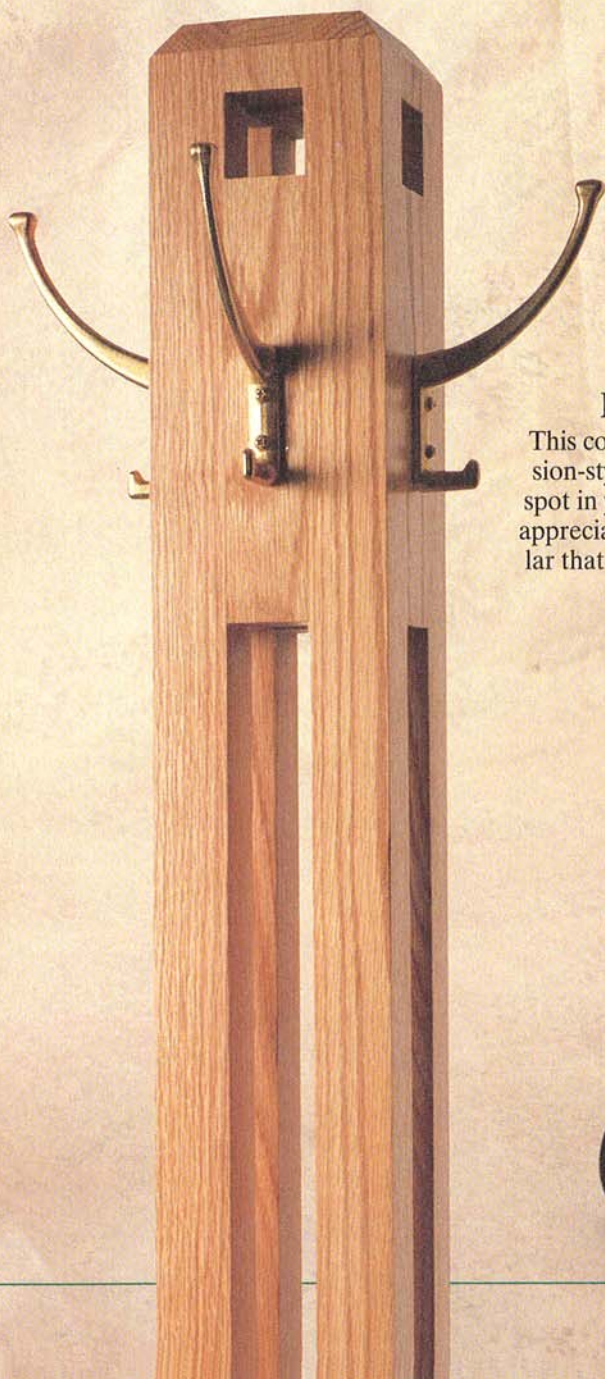
A design this nice deserves lots of exposure. That's why we included a wall frame to display your handiwork for all to see—and to use regularly.



23

PILLAR OF HOSPITALITY

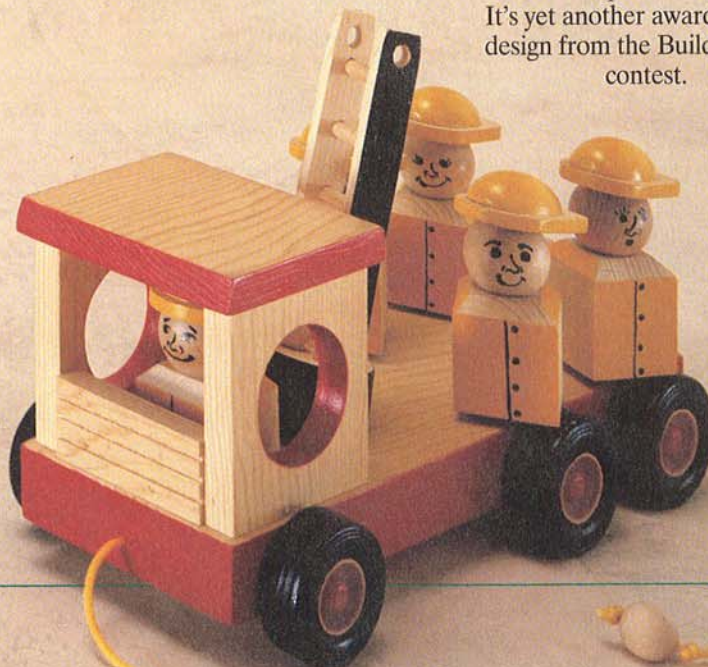
This coat tree, our sixth mission-style design, deserves a spot in your entryway. You'll appreciate the rock-steady pillar that can handle the heaviest outerwear.



26

HIGH-REVIN' HOOK 'N' LADDER

Here's a fun-to-build toy with plenty of action. As your future firefighter pulls the truck, the colorful crew members spin around on top of the rear wheels. It's yet another award-winning design from the Build-A-Toy® contest.



Country-Cordial Welcome Shelf

Display a few curios on this versatile piece to add warmth to your front hallway. Or, hang it in the kitchen so old friends will know where to find their favorite coffee mugs.



Photograph: Wm. Hopkins

CUTTING OUT THE SHELF PARTS IS A CINCH

Note: This project calls for thin stock. We recommend planing or resawing the $\frac{1}{2}$ "- and $\frac{1}{4}$ "-thick pieces from thicker stock.

1 Lay out the gridded pattern for the back (A) on page 7 in full size on an 11×30" piece of paper. (We keep a roll of butcher paper in our shop for such purposes. For a full-sized pattern, see our offer on page 7.) From a 96" length of $\frac{3}{4}$ × $7\frac{1}{4}$ " stock, crosscut a piece to 27 $\frac{1}{2}$ ", and adhere the pattern to it. (We used clear pine.)

TIP We recommend attaching your patterns with 3M SprayMount or a similar spray adhesive. You can find such products at crafts and art-supply stores.

Bandsaw the contoured edge, then crosscut the back to 27 $\frac{1}{2}$ ".

2 From your leftover $\frac{3}{4}$ × $7\frac{1}{2}$ " stock, rip and crosscut the shelf (B) and the lower back (C) to the dimensions listed in the Bill of Materials. Plane or resaw the lower back to $\frac{1}{2}$ " thick.

3 Make two copies of the full-sized Bracket pattern (D) on page 8. (We photocopied ours.) Crosscut two 6" lengths of $\frac{3}{4}$ × $7\frac{1}{2}$ " stock, and stack them using double-faced tape. Adhere the two patterns to the top piece end-to-end, aligning the corners with the corners of the stock. Now, bandsaw the contoured edges of the brackets to shape, and separate the four pieces.

BANDSAW AND FRAME YOUR MESSAGE

1 Cut the frame (E) to the dimensions listed in the Bill of Materials, then plane or resaw it to $\frac{1}{4}$ " thick. Scribe a line $\frac{5}{8}$ " in from all sides of the frame, and draw a $\frac{1}{4}$ " radius at each corner. Next, chuck a $\frac{1}{2}$ " Forstner bit into your drill press, and bore a hole centered in each radius. Now, mount a #5 blade on your scrollsaw, and cut out the center waste.

2 Now, align the frame with the edges of the lower back, glue, and clamp.

3 Copy the full-sized Letter patterns on page 9, and adhere them to the $\frac{1}{4}$ "-thick center waste you cut out of the frame. Drill a start hole in the interior of the O, then cut out the letters on your scrollsaw.

4 When the glue has dried on the frame and lower back, position the letters within the frame as you intend to glue them, and make small reference marks with a pencil. Apply a thin bead of glue to the back of each letter, set it in position, and clamp on a piece of $\frac{3}{4}$ "-thick scrap large enough to cover all letters. When the glue has dried, sand the letter and frame faces and the outside frame edges with 180-grit sandpaper.

NOW, ROUND YOUR EDGES AND ATTACH THE BRACKETS

1 Fit your table-mounted router with a $\frac{3}{16}$ " piloted round-over bit, and round the contoured edges on the upper back and the brackets. Next, round the shelf edges and ends on both

Continued

BILL OF MATERIALS

Part	Finished Size			Matl.	Qty.
	T	W	L		
A upper back	3/4"	7 1/4"	27 1/2"	P	1
B shelf	3/4"	4 1/2"	30"	P	1
C lower back	1/2"	5 1/2"	27 1/2"	P	1
D bracket	3/4"	4 1/4"	6"	P	4
E frame	1/4"	5 1/2"	27 1/2"	P	1

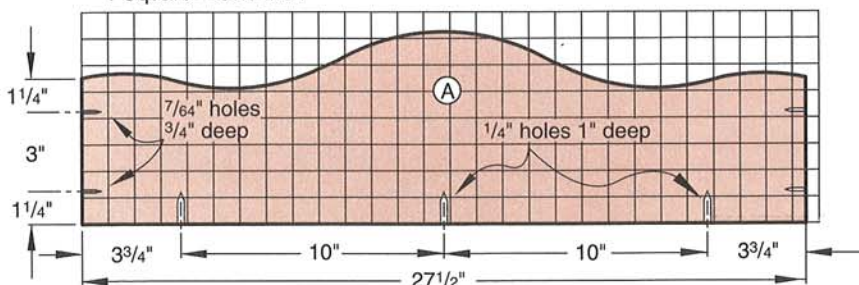
Materials Key: P—Pine.

Supplies: 1/4x2" dowels, stain, acrylic paints, finish, triangle picture hangers, #8x1 1/2" flathead wood screws, #10x1 1/2" panhead wood screws.

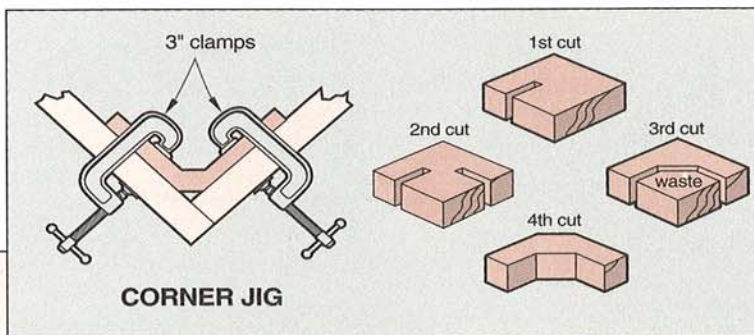
To order a full-sized upper back pattern, send \$1 for handling and a self-addressed business-sized envelope with 52 cents postage to:

Country-Cordial Shelf Pattern
Weekend Woodworking Projects
1912 Grand Ave.
Des Moines, IA 50309-3379

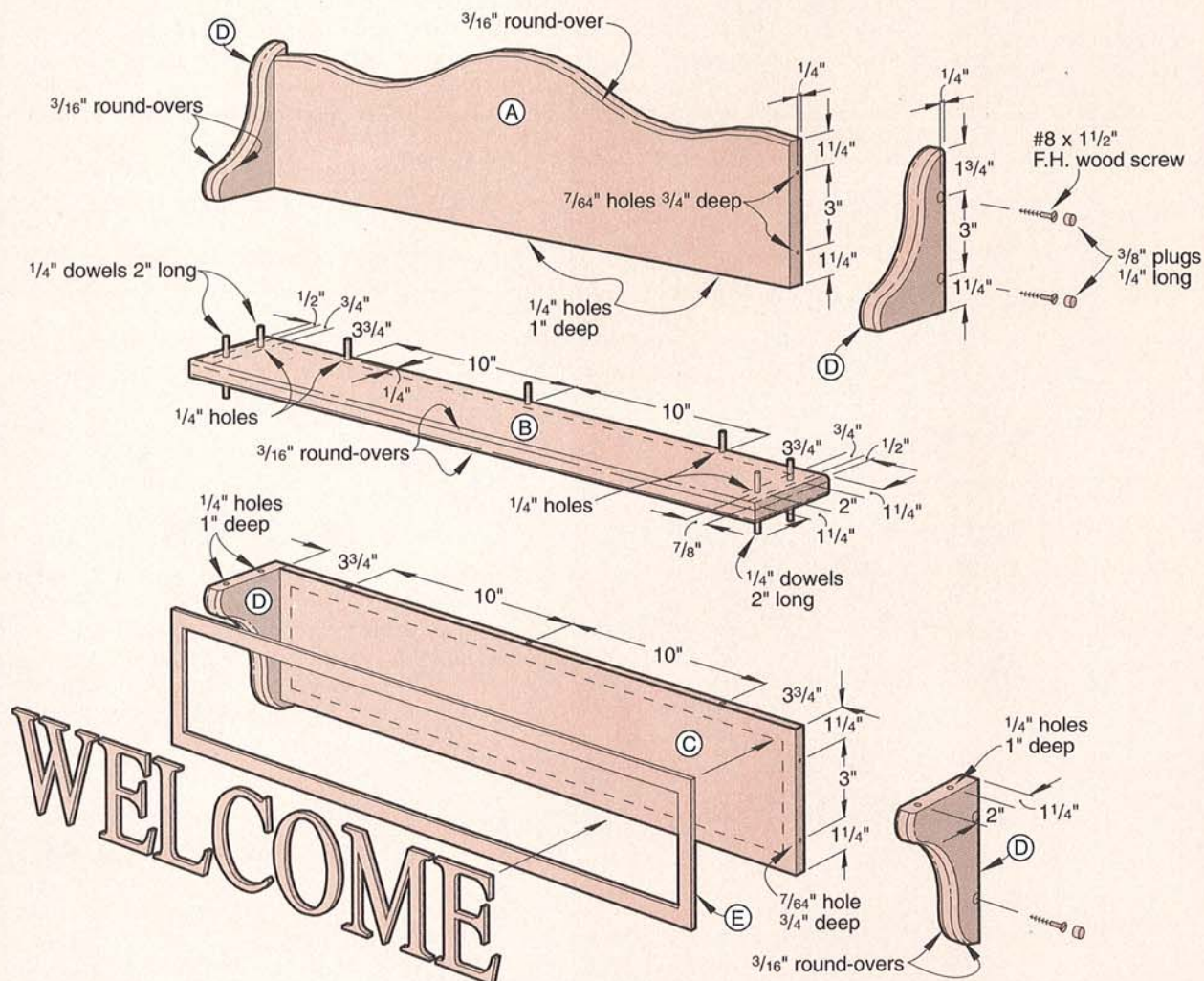
1 Square = One Inch



GRIDDED PATTERN



CORNER JIG



WELCOME SHELF

top and bottom. Now, sand these contoured edges using a 1½"-diameter sanding drum on your drill press.

2 Lay out and drill ¼" dowel holes through the shelf using a brad-point bit on your drill press. Now, sand the upper back, the brackets, and both shelf faces with 180-grit sandpaper.

3 Attach brackets to the upper back and the lower back assembly. First, counterbore two ⅜" holes ¼" deep in each bracket where shown on the full-sized Bracket pattern below. Make a pair of corner jigs as shown on page 7, and use them to clamp the brackets to the back piece. Drill a ⅝" countersunk shank hole and a ⅞" pilot hole 1¼" deep in each counterbore.

4 Remove the brackets, and apply glue to the mating surfaces on each bracket and the upper back. Clamp the pieces with your corner jigs, and drive #8×1½" flathead wood screws. Repeat for the two remaining brackets and the lower back assembly.

5 From your bracket-cutting scrap, cut eight ⅜"-diameter plugs with a plug cutter. Glue a plug into each screw hole in the brackets, then wipe away any glue squeeze-out with a damp cloth. After the glue has dried, sand the plugs flush.

USE JUST ONE SET OF DOWELS FOR BOTH BACK ASSEMBLIES

1 Insert a dowel center in each hole on the top face of the shelf.

Position the upper back assembly on the shelf where shown on the Exploded View drawing, and press down on it lightly to transfer the dowel locations. Drill ¼" dowel holes 1" deep using a brad-point bit on your drill press. Now, flip the shelf over, insert the dowel centers into the holes on the bottom face, and repeat this procedure for the lower back assembly.

2 Glue a ¼×2" dowel into each shelf hole, leaving ⅝" of the dowel exposed both above and below the shelf. Allow the glue to dry.

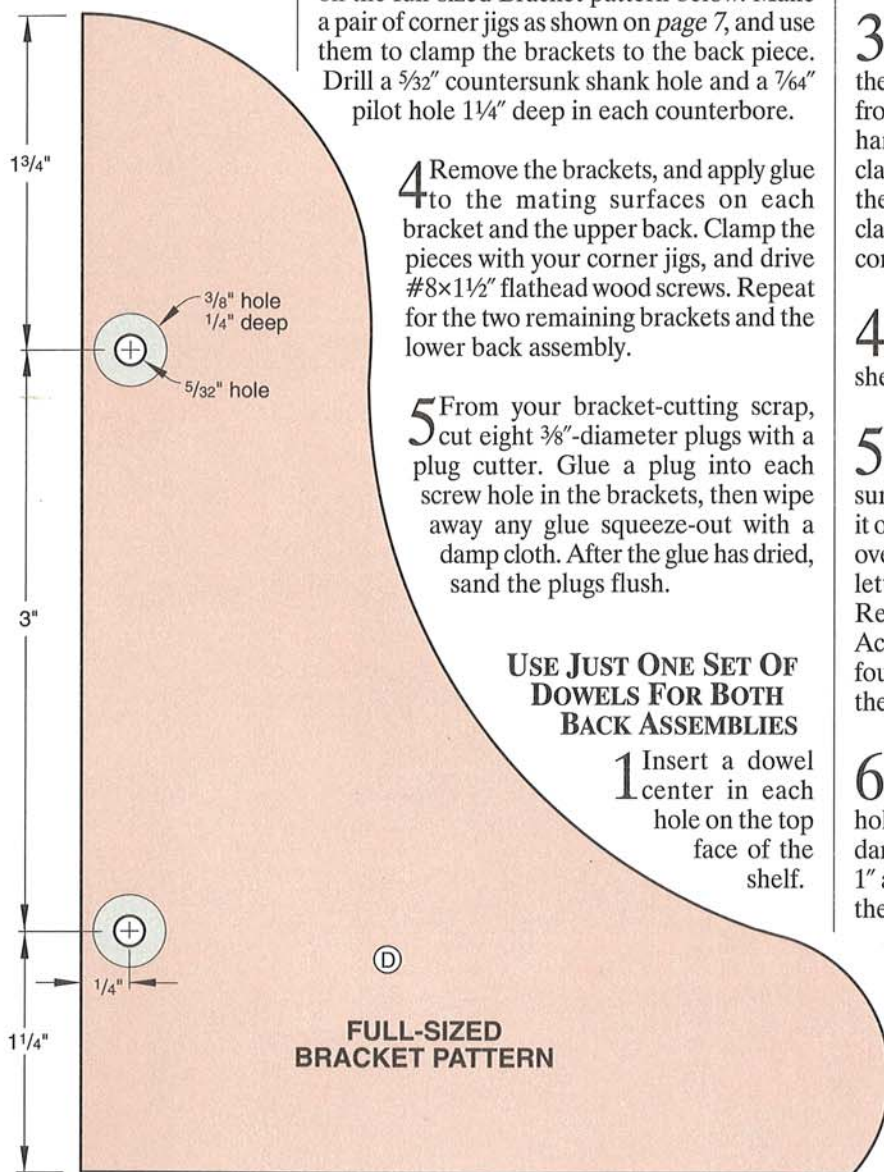
3 Now, dry-assemble the upper back assembly and the shelf to check for fit. Apply glue to the mating surfaces, and clamp. (We secured the front end of each bracket to the shelf with a small handscrew clamp. Then, we clamped a bar clamp to the center of each concave contour on the back and to the bottom of the shelf. For clamp pads, we used the waste pieces from these contour cuts to create a flat clamping surface.)

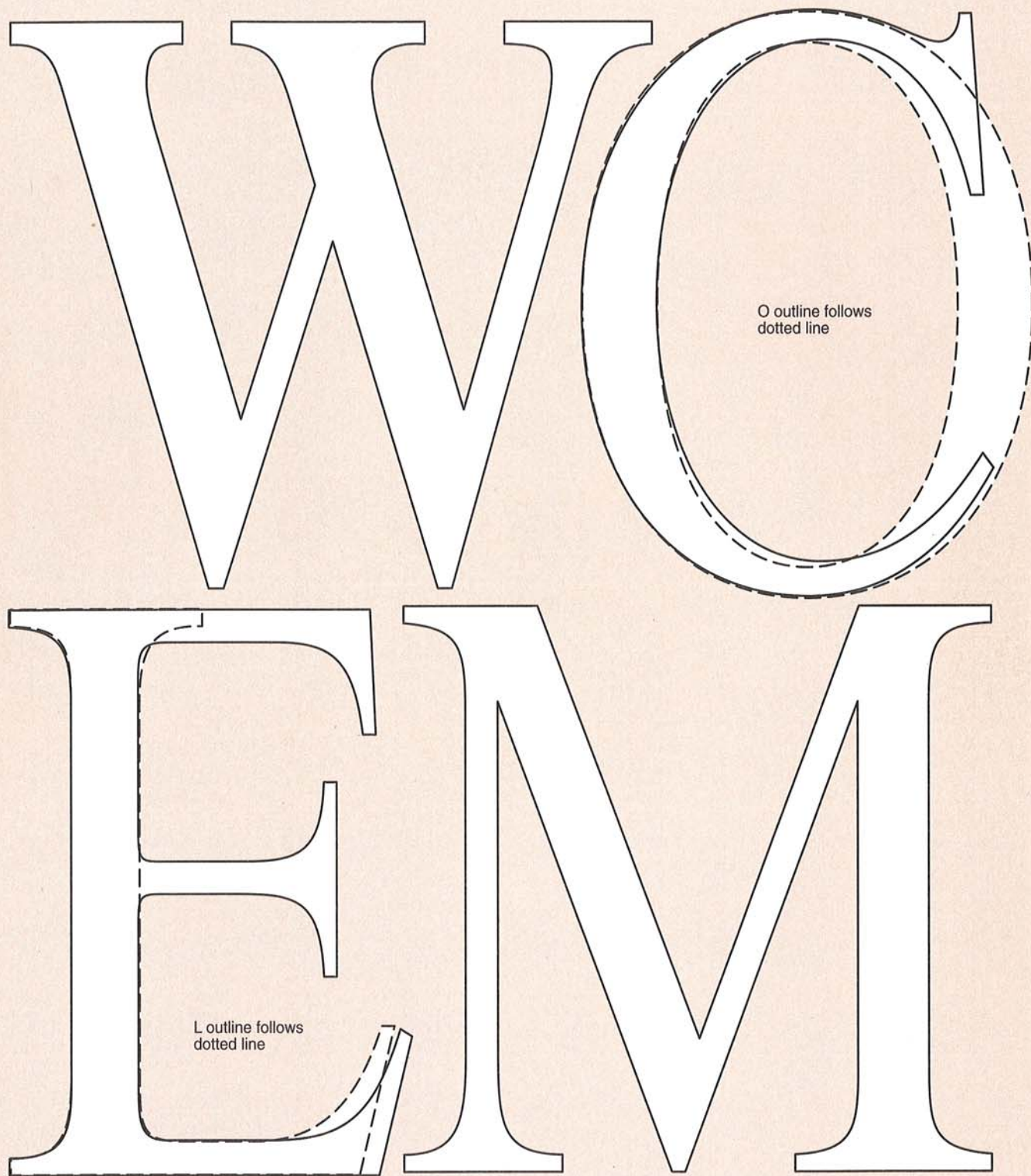
4 Repeat Step 3 for the lower back assembly. When the glue has dried, unclamp your shelf, and finish-sand with 180-grit sandpaper.

5 Apply your choice of finishes. (We brushed on Minwax fruitwood stain over the entire surface, let it stand for 10 minutes, then wiped it off with a clean cloth. After the stain had dried overnight, we painted the framed area and the letter edges with Accent Country Colors Barn Red and trimmed the bracket edges with Accent's Stoneware Blue, both of which we found at a local crafts store. Finally, we sprayed the entire piece with Deft satin spray-on finish.)

6 To wall-mount your shelf, use a pair of triangle picture hangers. Lay out and drill pilot holes for the hanger screws 16" apart (the standard width between stud centerpoints) centered 1" above the shelf on the upper back. Screw on the hangers. Locate a pair of studs in the wall, and mount a #10×1½" panhead wood screw in each stud exactly 16" apart. ■

Project designer and builder:
Chuck Hedlund, Des Moines
Illustrations: Roxanne LeMoine



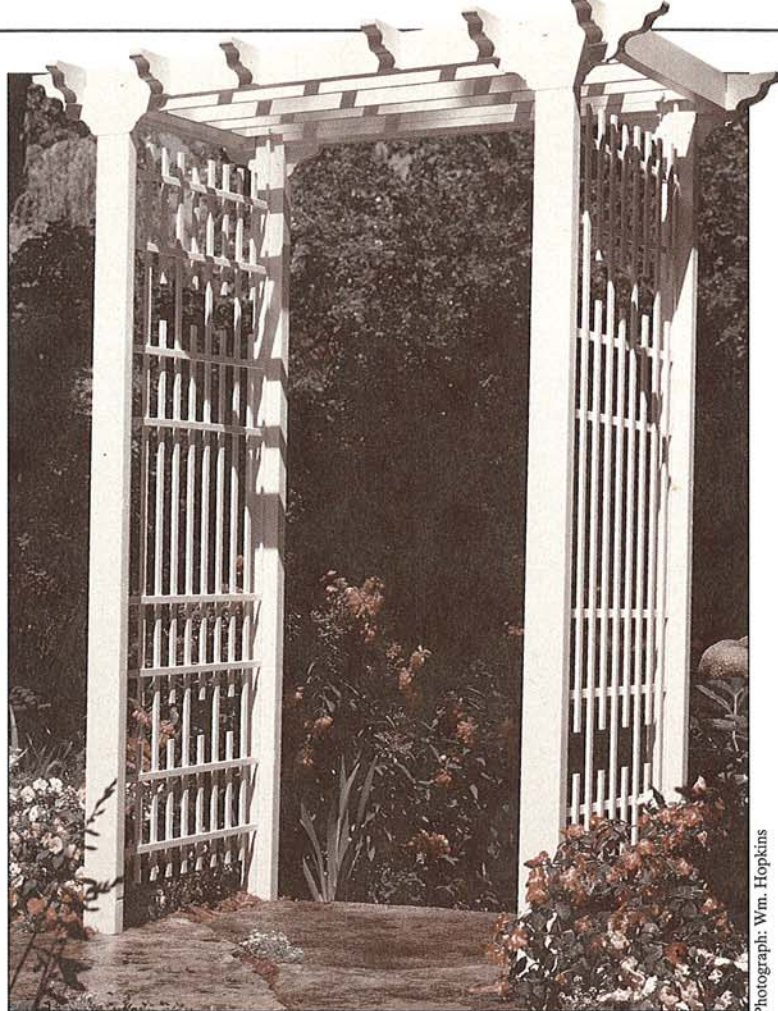


FULL-SIZED PATTERNS

*A show-stopping
backyard design*

Gracious Garden Arbor

***L**ooking for a structure to take center stage in your landscaping plan? This elegant piece provides a perfect focal point for even the fanciest of gardens. And when you're through with it in the fall, just disassemble it for wintertime storage.*



Photograph: Wm. Hopkins

THE FRAME GOES TOGETHER WITH LAP JOINTS AND EASY BANDSAW CUTS

1 From your 2x4 stock, crosscut four uprights (A) to 81½", two beams (B) to 63½", and two crossbeams (C) to 39¼" as shown on the Exploded View drawing *opposite*. (We selected cedar. We avoided treated lumber because of probable warpage.)

2 Mount a ⅜" dado set on your tablesaw, and cut a full-length, ⅜"-deep groove down the center of the inside face of each upright. Change your dado set to ¾", and cut a 6½"-long half lap ¾" deep in the top end of the outside face of each upright for the T-lap joints. Now, lay out and cut a 3½"-wide mating half lap starting 7¾" in from each end of both beams where shown on the Top Frame drawing *opposite*.

3 Lay out 1½"-wide notches 1¾" deep on your beams and crossbeams for the four edge-lap joints. To do this, mark a notch starting 4¾" in from each end on the top edge of the beams. Next, mark a mating notch 4¾" in from each end on the bottom edge of the crossbeams. Elevate

your ¾" dado to 1¾", and use your miter gauge to cut all eight notches. (We used our rip fence as a stop for the inside end of the notch and clamped a ¾"-thick board to the fence as a stop for the outside end as shown on *page 12*.)

4 Make copies of the full-sized End pattern shown on *page 14*. (We photocopied ours.) Adhere one pattern to each end of both beams. (**Note:** Refer to the *Top Frame* drawing for the correct orientation of the patterns to the beams and crossbeams before sawing.) Now, bandsaw the ends to shape.

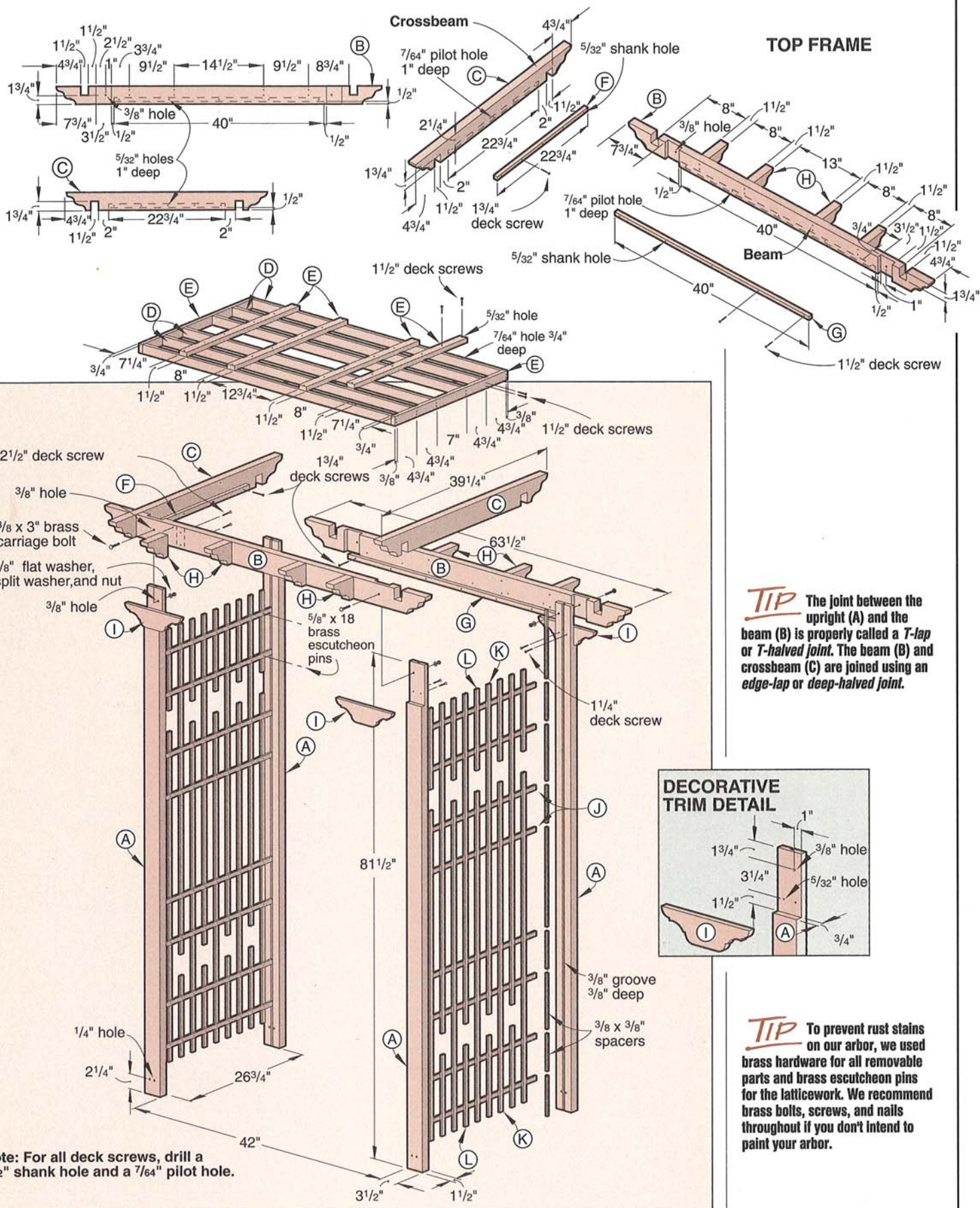
5 Repeat this step for the crossbeams, then sand the ends of the beams and crossbeams using a 1"-diameter drum sander in your drill press.

NOW, ASSEMBLE THE TOP GRID AND BANDSAW THE TRIM PIECES

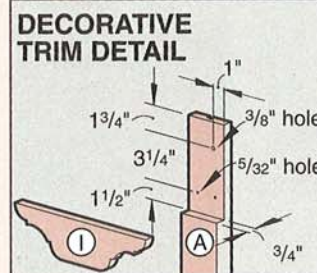
1 For the top grid, rip and crosscut six Ds and six Es. (At this point, we dry-assembled the beams and crossbeams and measured the

Continued

TIP If you prefer not to paint your arbor, we recommend redwood both for appearance and durability.



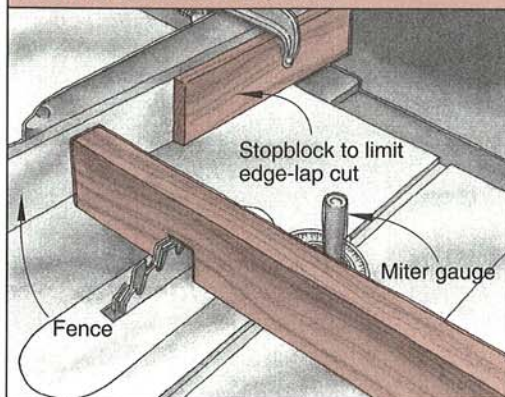
TIP The joint between the upright (A) and the beam (B) is properly called a *T-lap* or *T-halved joint*. The beam (B) and crossbeam (C) are joined using an *edge-lap* or *deep-halved joint*.



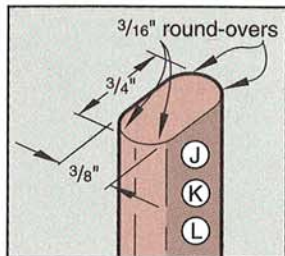
TIP To prevent rust stains on our arbor, we used brass hardware for all removable parts and brass escutcheon pins for the latticework. We recommend brass bolts, screws, and nails throughout if you don't intend to paint your arbor.

GARDEN ARBOR

CUTTING THE EDGE-LAP JOINTS



opening to make sure that the Ds and Es would fit inside.) Now, assemble the top grid as shown on the Exploded View drawing on *page 11*. (We used Tite-Bond II waterproof glue and $1\frac{1}{2}$ " deck screws.) After attaching an E to each end of the six long members (D), square the assembly by measuring diagonally, and tack on a diagonal strip to hold it square as shown *above right*. Next, flip the grid over, and attach the four remaining short members. (See the Exploded View drawing for positioning details.)



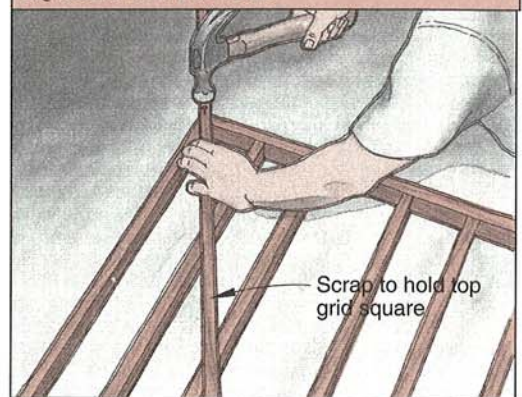
LATTICE DETAIL

2 Cut four support cleats—two Fs and two Gs—to the dimensions shown in the Bill of Materials. Glue and screw them to the beams and crossbeams. (We placed a piece of $\frac{1}{2}$ "-thick plywood underneath the cleats to raise them to the correct height.)

3 Place the top grid assembly inside the beam/crossbeam assembly so the top grid rests on the cleats. Using a combination square, transfer the location of each E onto the face and edge of each beam so that you can align each end (H) with an E.

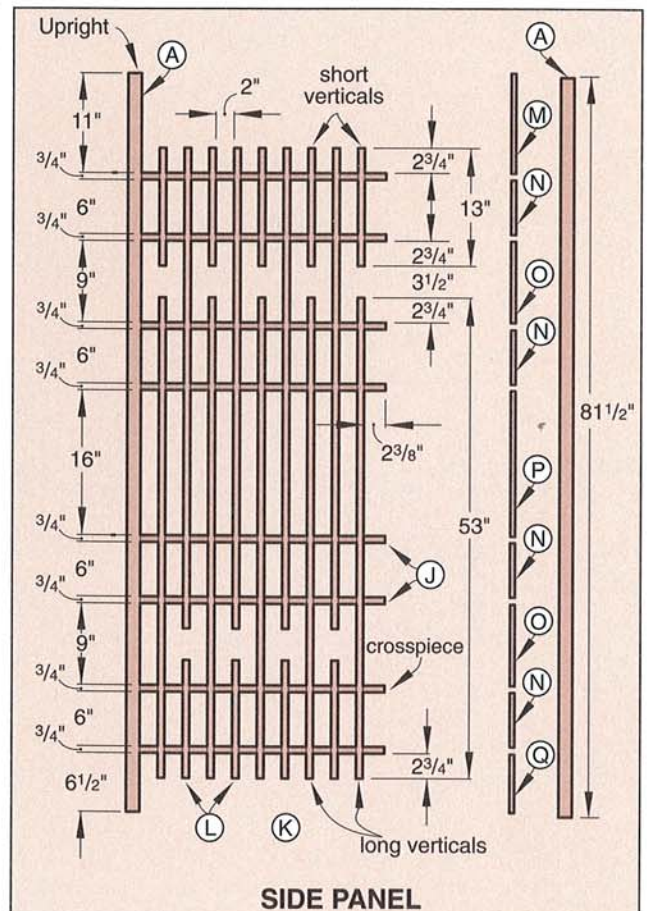
4 Stack and clamp two 24" lengths of leftover 2x4, and adhere four copies of the full-sized End pattern to the top face. Bandsaw the contoured ends to shape, then crosscut the ends to length. Sand the cut edges as in Step 5 on *page 10* above, and separate the pieces. Now, glue and screw four ends to each beam, one at each E location. To

SQUARING THE TOP GRID



do this, countersink $\frac{5}{32}$ " shank holes on the inside beam face, drill $\frac{7}{64}$ " pilot holes 1" deep in each H, and then use two $2\frac{1}{2}$ " deck screws.

5 Make four copies of the half pattern for the decorative trim (I) shown on *page 14*. Tape two pairs together along the centerlines to make two full patterns. Cut four pieces of $\frac{3}{4}$ "-



SIDE PANEL

BILL OF MATERIALS

Part	Finished Size			Matl.	Qty.
	T	W	L		
Basic Frame					
A	1½"	3½"	81½"	C	4
B	1½"	3½"	63½"	C	2
C	1½"	3½"	39¼"	C	2
Top Grid and Trim					
D	¾"	1½"	49¼"	C	6
E	¾"	1½"	26¾"	C	6
F	¾"	¾"	22¾"	C	2
G	¾"	¾"	40"	C	2
H	1½"	3½"	4¾"	C	8
I	¾"	3"	11"	C	4
Side Panels					
J	¾"	¾"	27½"	C	16
K	¾"	¾"	53"	C	18
L	¾"	¾"	13"	C	18
M	¾"	¾"	11"	C	4
N	¾"	¾"	6"	C	16
O	¾"	¾"	9"	C	8
P	¾"	¾"	16"	C	4
Q	¾"	¾"	6½"	C	4

Materials Key: C—Cedar

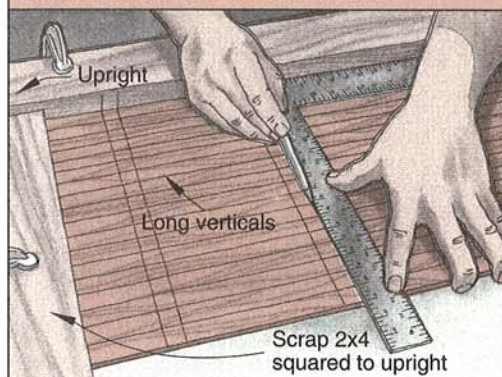
Supplies: Waterproof glue; concrete/gravel pre-mix; primer; paint; ⅝"×18 brass escutcheon pins; 1¼", 1½", and 2½" deck screws; ⅜×3" brass carriage bolts, flat washers, split washers, and nuts; ¼×2" brass carriage bolts, flat washers, split washers, and nuts; ½×2" galvanized steel mending plate.

thick stock to 3×11". Stack two pairs of pieces using double-faced tape, attach the two full patterns, and bandsaw to shape. Sand the band-sawed edges as before, and separate the pieces.

LET THE SPACERS SIMPLIFY YOUR LATTICEWORK LAYOUT

1 From your ¾"-thick stock, rip 22 strips to ⅜×96". Set up your table-mounted router, and rout ⅜" round-overs on all edges of 18 strips. (Set aside four strips for parts M through Q.) For your latticework, cut 16 crosspieces (J) to 27½", 18 long verticals (K) to 53", and 18 short verticals (L) to 13" from the 96"-long strips.

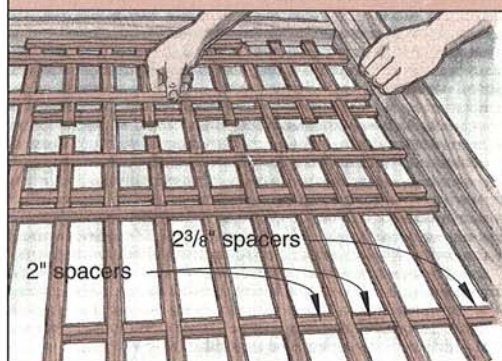
MARKING CROSSPIECE POSITIONS



2 Lay out the position of each crosspiece on the edge of one upright where shown on the Side Panel drawing on page 12. Place this upright at the edge of your workbench, and clamp it there. Next, clamp a scrap 2×4 perpendicularly to the upright 3¾" from the bottom of the first crosspiece. Now, align the 18 long verticals in this squared corner. Use your framing square to transfer each set of crosspiece lines onto all strips as shown above.

3 Now, you can lay out your lattice panels using the Side Panel drawing as a guide. First, clamp a second perpendicular 2×4 at the other end of the upright to square the latticework. From ¾- or ⅜"-thick scrap, cut ten 2⅜"-long spacers and about a hundred 2"-long spacers. Use the longer spacers between the uprights and

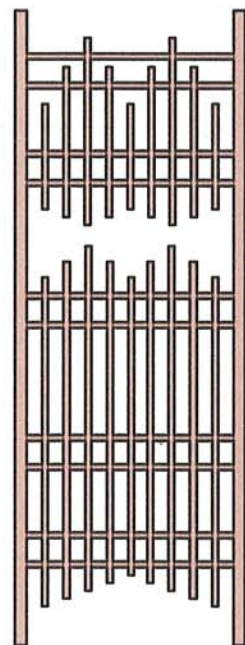
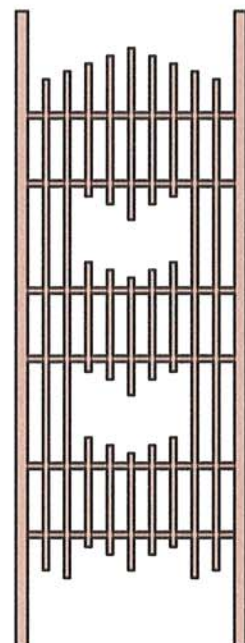
LAYING OUT THE LATTICEWORK



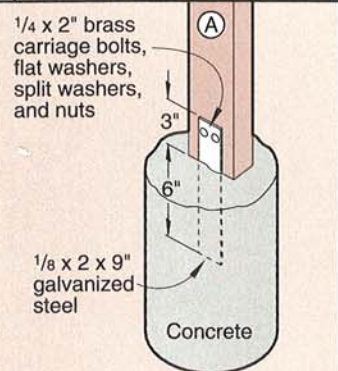
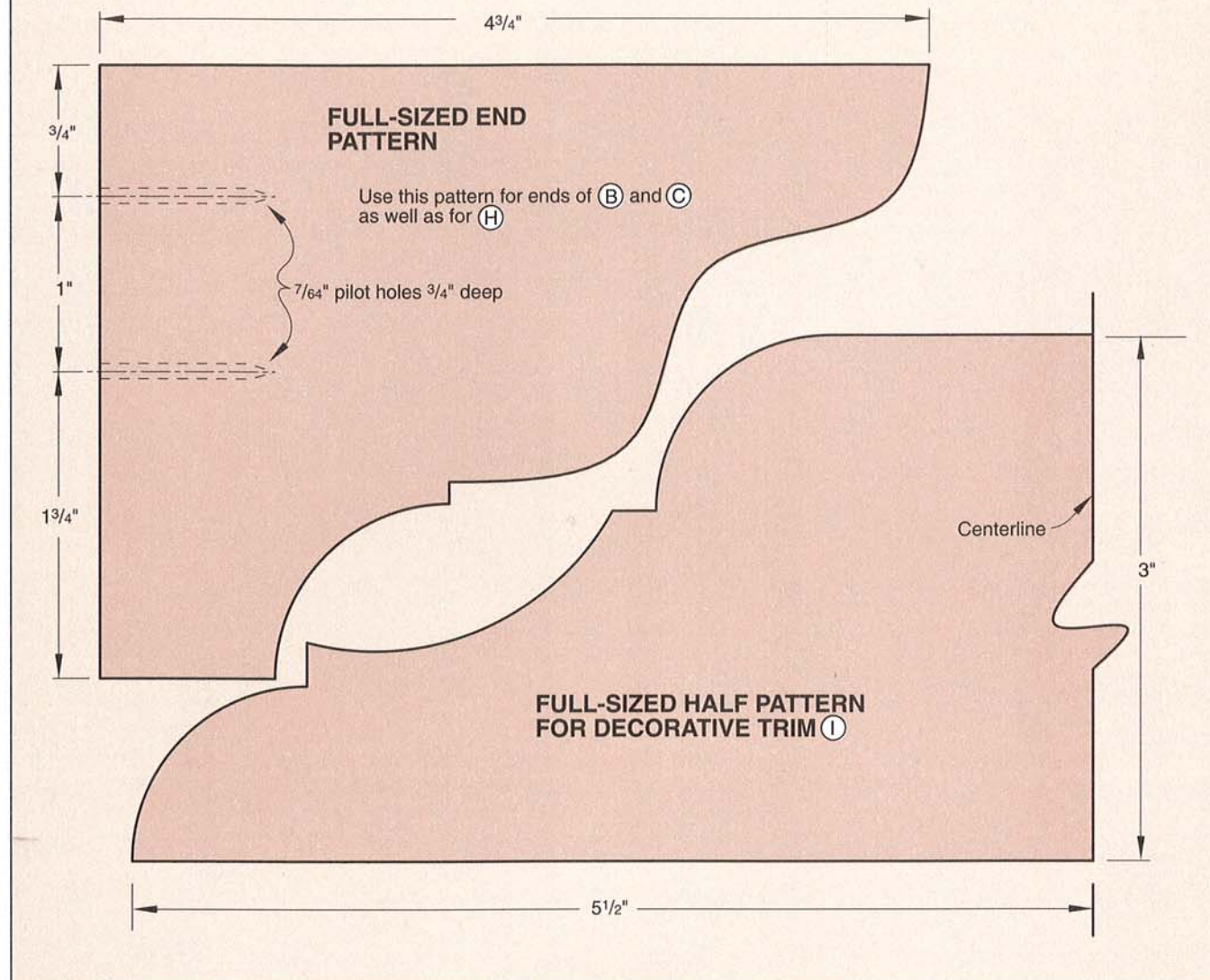
the first lattice strips and the shorter ones between pairs of vertical strips as shown above.

4 Lay out the long verticals first using the longer spacers. Then, add the short verticals, and lay the crosspieces over the top. Working one crosspiece at a time, apply a dab of glue at each junction, then nail the crosspiece in place with ⅝"×18 brass escutcheon pins.

Continued



**OPTIONAL
SIDE PANELS**



POST SETTING

Project design: Bob Colpetzer, Clinton, Tenn.; side panels by Lorna Johnson, Des Moines
Illustrations: Roxanne LeMoine, Carson Ode
Project builder: Brad Sommers

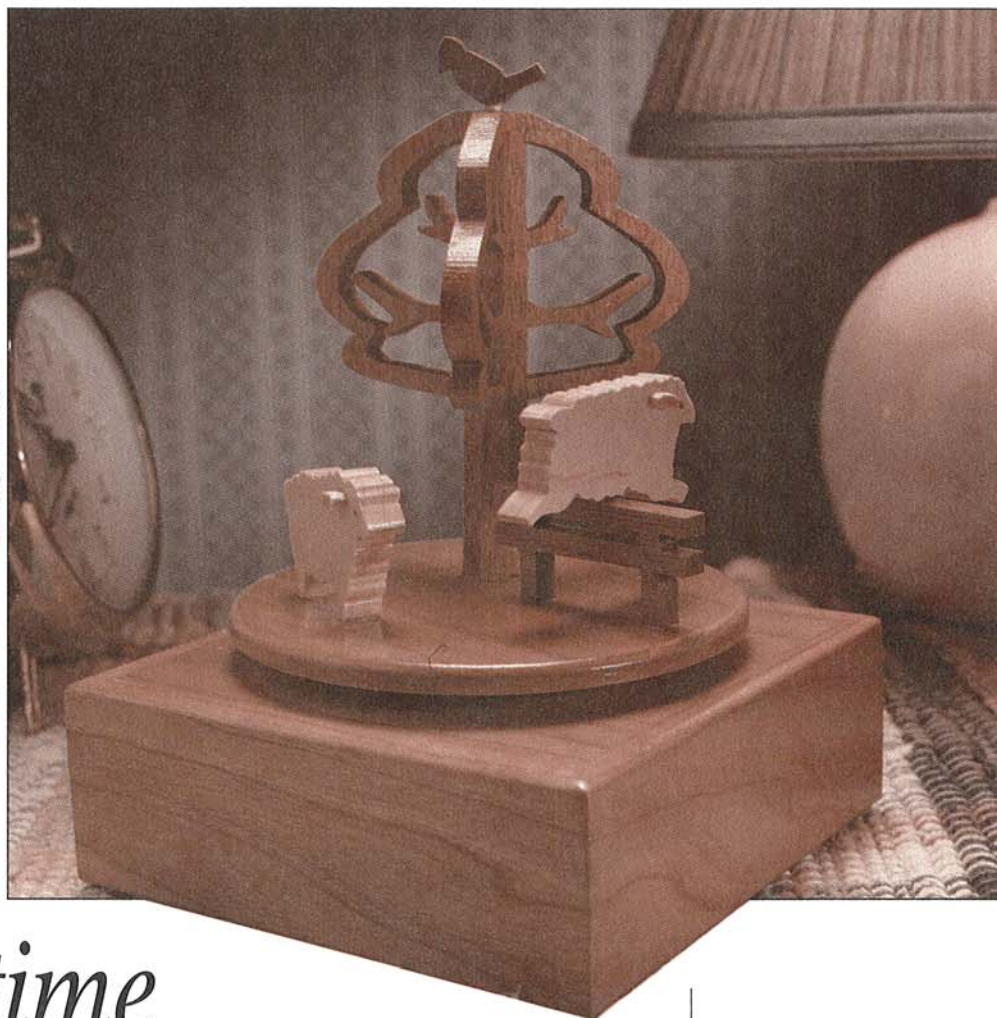
BOLT—DON'T GLUE—YOUR ARBOR (IT'S COLLAPSIBLE FOR STORAGE)

1 Transfer the crosspiece positions (as marked on the upright you used for lattice assembly) to the grooved faces of the remaining uprights. Next, glue and screw a decorative trim piece to the bottom of the half lap on each upright using 1 1/4" deck screws. Glue and clamp the crossbeams to the beams and the top grid to the support cleats. After the glue has dried, fit an upright into each half lap on the beams so the frame will stand by itself. At each corner, drill a 3/8" hole through the beam, the upright, and the long grid member, and attach a 3/8x3" brass carriage bolt, a flat washer, a split washer, and a nut.

2 Install the assembled lattice panels by gluing the crosspieces into the 3/8" grooves in the uprights where marked. Trim your leftover lattice strips to 3/8" wide, and cut spacers (M through Q) as dimensioned in the Bill of Materials. Glue the spacers into the grooves.

3 Disassemble your arbor, and paint all surfaces. (We gave ours a coat of primer, then used a white exterior trim enamel.) When the paint is dry, place the arbor in its outdoor location, and anchor the uprights to the ground. (We cut a 9" length of 1/8x2" galvanized steel mending plate for each upright, then drilled two 1/4" holes through each plate and upright where shown on the Post Setting drawing at left. We inserted 1/4x3" bolts through the anchor plates and uprights from the inside. To keep the uprights from sinking into the concrete, we bolted two 48"-long scrap 1x4s (using the same bolts) to the outside faces, keeping the 1x4s flush with the ends of the uprights. We then dug 6"-diameter holes 12" deep, filled them with a concrete/gravel pre-mix, and set the arbor in position, allowing the anchor plates to submerge in the concrete. When the concrete had set, we removed the 1x4s and 3" bolts and secured each upright with two 1/4x2" brass carriage bolts, flat washers, split washers, and nuts.) ■

*Fidgety kids
wind down
as the sheep
go 'round*



Slumbertime Music Box

Crank up the revolving platform, and a couple of Nature's woolliest vault lazily over the fence. Guaranteed to yield yawns before Brahms' Lullaby needs a rewind.

FIRST, BUILD THE BOX AND MOUNT THE MUSIC MOVEMENT

Note: This project calls for thin stock. We recommend planing or resawing the 1/2", 3/8", and 1/4"-thick material from thicker stock.

1 To make the box sides (A), rip a 1 3/4"-wide strip from a 3/4x7 1/4x24" piece of stock, then plane or resaw it to 1/2" thick. (We selected cherry for the box and platform.) Fit your table-mounted router with a rabbet bit, and rout a 3/8" rabbet 1/4" deep on both edges. Lay out the sides as dimensioned in the Bill of Materials, and mark the pieces consecutively (1, 2, 3, 4) so you can

match the grain when gluing up the box. Now, tilt your tablesaw blade to 45°, and miter-cut both ends of each side to 5" long.

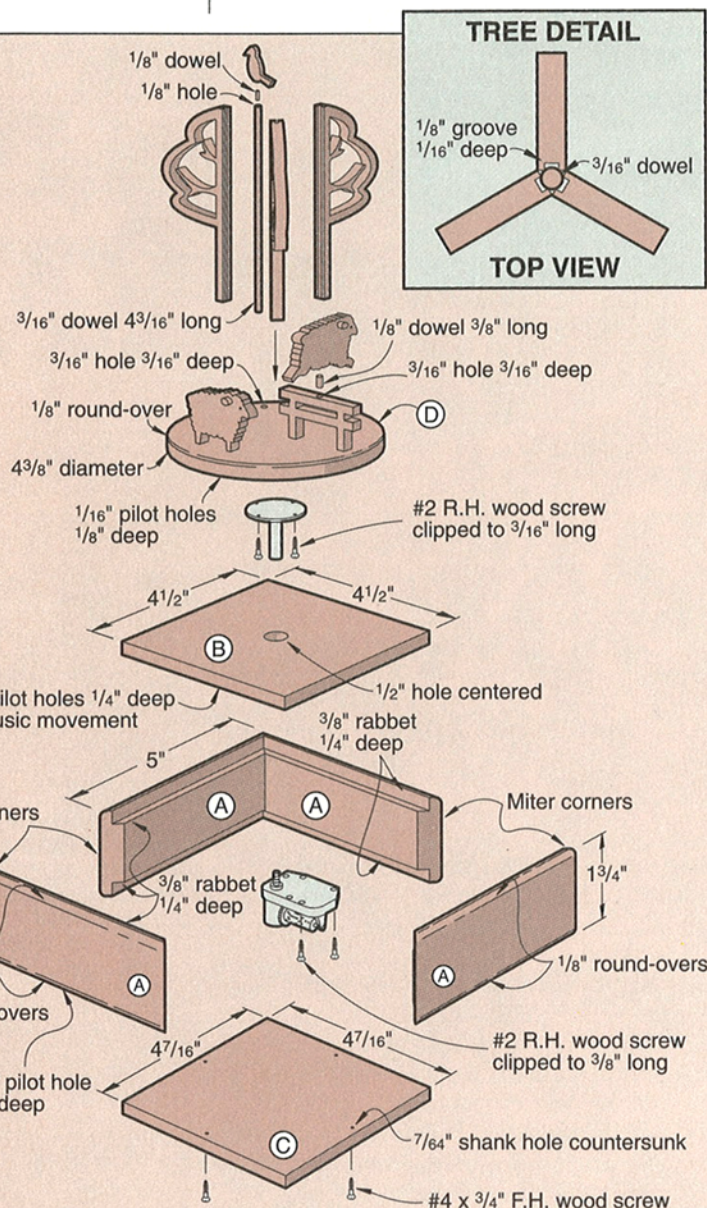
2 Lay the four sides end-to-end in consecutive order with the outside face up on your bench. Make sure the miter joints are aligned snugly, and tape them together with masking tape—this will serve as a clamp. Flip the sides over, spread glue on the mating surfaces, and fold the sides into a square. Tape the fourth miter joint together to complete the box.

Continued

TIP We recommend 3M SprayMount or a similar adhesive for adhering patterns. It's much neater to work with than rubber cement and rubs off easily. You can find it at most art-supply and crafts stores.

MUSIC BOX

3 For the top (B) and bottom (C), plane or resaw the remainder of your $\frac{3}{4} \times 7\frac{1}{4}$ " stock to $\frac{3}{8}$ " thick. Measure the opening in the top of the box, then rip and crosscut the top to fit snugly. Measure the bottom opening, then rip and crosscut the bottom to leave a $\frac{1}{32}$ " clearance on all sides. (Our top and bottom measured $4\frac{1}{2}$ " square and $4\frac{7}{16}$ " square respectively.) Now, sand the edges of the bottom, and fit it into the box. Drill $\frac{7}{64}$ " countersunk shank holes through the bottom where shown on the Exploded View drawing, then drill $\frac{5}{64}$ " pilot holes in the sides to a total depth of $\frac{3}{4}$ ". Attach the bottom using



BILL OF MATERIALS

Part	Finished Size			Mati.	Qty.
	T	W	L		
A side	$\frac{1}{2}$ "	$1\frac{3}{4}$ "	5"	C	4
B top	$\frac{3}{8}$ "	$4\frac{1}{2}$ "	$4\frac{1}{2}$ "	C	1
C bottom	$\frac{3}{8}$ "	$4\frac{7}{16}$ "	$4\frac{7}{16}$ "	C	1
D platform	$\frac{1}{4}$ "	$4\frac{3}{8}$ " dia.		C	1
tree	$\frac{1}{4}$ "	2"	4"	MG	3
bird	$\frac{1}{4}$ "	1"	1"	W	1
fence	$\frac{1}{4}$ "	1"	2"	W	1
sheep1	$\frac{3}{8}$ "	$1\frac{3}{8}$ "	$2\frac{1}{4}$ "	M	1
sheep2	$\frac{3}{8}$ "	$1\frac{3}{8}$ "	$2\frac{1}{4}$ "	M	1
ear	$\frac{1}{8}$ "	$\frac{1}{8}$ "	$\frac{1}{4}$ "	M	

Materials Key: C—Cherry; MG—Mahogany; W—Walnut; M—Maple.

Supplies: $\frac{1}{8}$ " dowel, $\frac{3}{16}$ " dowel, $\frac{3}{4} \times \#4$ flathead wood screws, quick-set epoxy, finish, self-adhesive cork pads.

Buying Guide

• **Music Movement and Turntable.** 18-note movement plays Brahms' Lullaby; 1"-dia. turntable rewinds movement. Key, wire stopper, label, and 7 screws included. Product no. 71199, \$13.00 ppd. Klockit, P.O. Box 636, Lake Geneva, WI 53147. Phone 800/556-2548.

#4x $\frac{3}{4}$ " flathead wood screws, then remove the four screws and set the bottom aside.

4 Dry-assemble the top and box to check for fit. Remove the top, and sand the edges as necessary. Locate the centerpoint on its back face, and bore a $\frac{1}{2}$ " hole through it. (We used a brad-point bit in our drill press.) Now, glue and clamp the top into the box.

5 After the glue has dried, carefully center the music movement stem in the $\frac{1}{2}$ " hole, and mark the screw locations for the movement on the back of the top. (See our Buying Guide to order the music movement.) Drill $\frac{1}{16}$ " pilot holes $\frac{1}{4}$ " deep, and clip the #2x $\frac{1}{2}$ " roundhead screws that come with the movement to $\frac{3}{8}$ ". Now, screw the movement onto the back face of the top. (**Note:** If you don't clip the $\frac{1}{2}$ " screws that come with the movement and turntable, you'll run the risk of penetrating the top faces of the box and platform.)

NOW, ADD THE PLATFORM AND ROUT THE ROUND-OVERS

1 To make the platform (D), plane or resaw your leftover $\frac{3}{8}$ "-thick stock to $\frac{1}{4}$ " thick. Select a back face, then draw 1"- and $4\frac{3}{8}$ "-diameter circles on it with a compass using the same cen-

terpoint. Cut out the platform on your scrollsaw, keeping the blade outside the line of the $4\frac{3}{8}$ "-diameter circle. Then, sand to the line. (We used our stationary disc sander.)

2 Lay out a point $1\frac{1}{2}$ " in from the edge of the platform top face, and drill a $\frac{3}{16}$ " hole $\frac{3}{16}$ " deep so you can attach the tree later on. (We used a brad-point bit on our drill press.)

3 Fit your table-mounted router with a $\frac{1}{8}$ " piloted round-over bit, and round the top edge of the platform and the top and bottom edges of the box. Then, finish-sand the platform top face and edge and the box top and sides. (We used a palm sander with 180- and then 320-grit sandpaper. We hand-sanded the platform edge.)

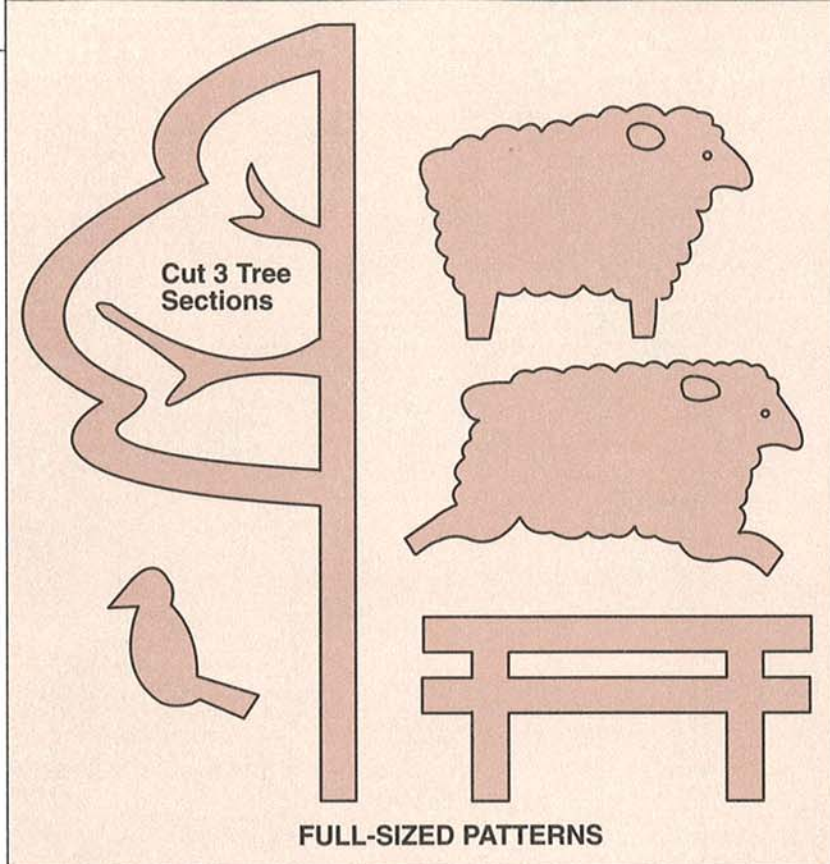
4 Use the 1" circle you drew on the back of the platform to position the turntable. Mark the screw locations, and drill $\frac{1}{16}$ " pilot holes $\frac{1}{8}$ " deep. Mix up some quick-set epoxy, and apply it to the mating surfaces. Clip off the $\#2\times\frac{1}{2}$ " roundhead wood screws that came with your turntable to $\frac{3}{16}$ ", screw on the turntable, and wipe off any epoxy squeeze-out.

TIME TO SHAPE THE SHEEP-GO-ROUND

1 Plane or resaw a 2×15 " strip of mahogany to $\frac{1}{4}$ " thick. Using a $\frac{1}{8}$ " straight bit on your table-mounted router, rout a full-length $\frac{1}{16}$ "-deep groove centered in one of the 15" edges. Make three copies of the full-sized Tree pattern above. (We photocopied ours.) Adhere them to the stock using spray adhesive, making sure the trunk side of the tree is aligned with the grooved edge of the stock. Drill a start hole in the waste area of each section, and cut out the interior using a $\#5$ blade on your scrollsaw. Then, cut out the three tree sections.

2 Cut a 12" length of $\frac{3}{16}$ " dowel, and clamp it upright in a vise or handscrew clamp. Squeeze glue into the grooves on your tree section edges, and use rubber bands to position them evenly around the dowel.

3 When the glue has dried, bandsaw the dowel flush at the treetop, and leave $\frac{3}{16}$ " protruding at the bottom. Now, clamp the tree upright in a handscrew clamp on your drill-press table, and drill a $\frac{1}{8}$ " hole $\frac{1}{4}$ " deep centered in the top of the $\frac{3}{16}$ " dowel. Cut a $\frac{3}{8}$ " length of $\frac{1}{8}$ " dowel, and glue it into the hole.



4 Copy the full-sized Bird and Fence patterns above. Adhere them to a $\frac{1}{4}\times 2\times 6$ " piece of walnut, and cut them out on your scrollsaw. Next, clamp the bird in a handscrew clamp, and use your drill press to drill a $\frac{1}{8}$ " hole $\frac{1}{8}$ " deep where the feet would be. Glue the bird onto the $\frac{1}{8}$ " dowel at the treetop.

5 Find the center of the top fence rail, and drill a $\frac{1}{8}$ " hole $\frac{1}{8}$ " deep. Glue a $\frac{3}{8}$ " length of $\frac{1}{8}$ " dowel into the hole.

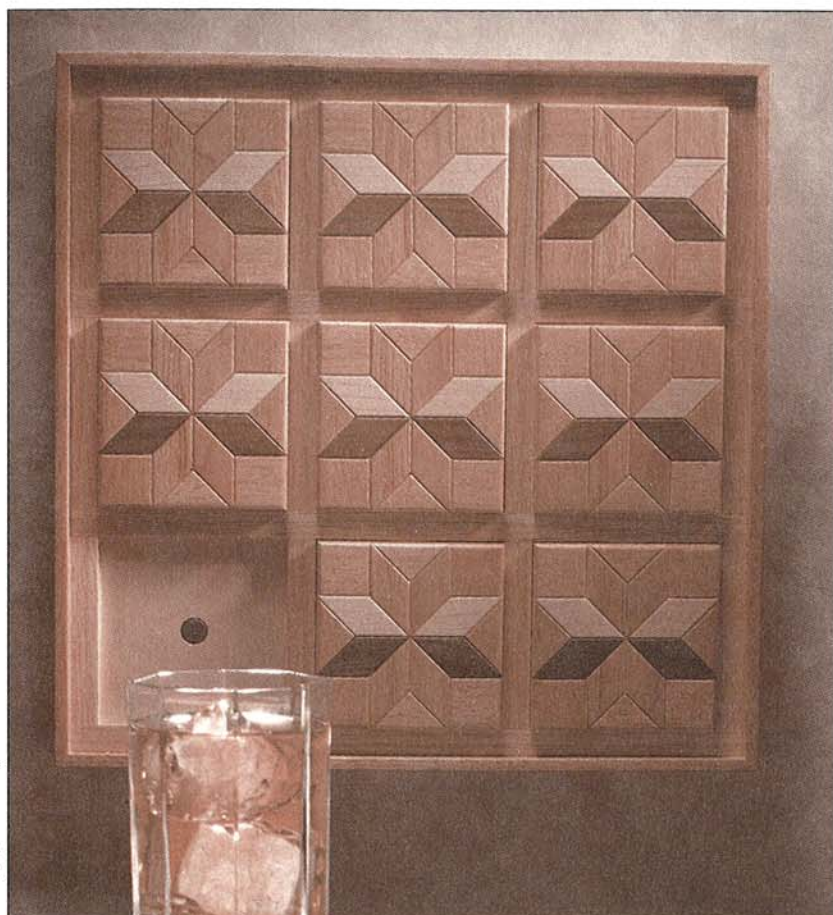
6 Make a copy of both full-sized Sheep patterns and two copies of each ear. Adhere the sheep patterns to a $\frac{3}{8}\times 2\times 8$ " piece of maple and the ear patterns to a $\frac{1}{8}\times 2\times 2$ " square of maple. Cut out the sheep and ears on your scrollsaw, then drill out the eyes using a $\frac{1}{16}$ " bit.

7 Glue and clamp the fence to the platform, positioning the outer post $\frac{5}{16}$ " from the edge. Glue the ears on both sheep, then glue the standing sheep 1" in from the edge, clamping it gently. Drill a $\frac{1}{8}$ " hole $\frac{1}{4}$ " deep in the bottom edge of the jumping sheep, and glue it onto the fence dowel. Now, glue the tree into the $\frac{3}{16}$ " hole on the platform.

8 Apply the finish of your choice. (We sprayed all surfaces with two coats of Deft semigloss spray-on finish.) Finally, attach a self-adhesive cork pad to each corner of the bottom. ■

TIP The music movement unwinds in a counter-clockwise direction, so make sure your sheep are facing that way.

Project design: David and Caroline Garlich, Martinsburg, W. Virginia
Illustrations: Roxanne LeMoine, Carson Ode
Project builder: Chuck Hedlund



*Almost too nice
to take down off
the wall....*

Captivating Quilt Coasters

Attractive handmade coasters like these shouldn't be relegated to a drawer—they deserve all the attention this wall frame provides. On the flip side, we've inlaid a cork disc to soak up moisture from cool drinks plus a hidden magnet to secure the coasters to the frame. To get started, spend a few minutes building our tablesaw jig—it will help you cut the patchwork pieces with amazing accuracy.

FOR STARTERS, RESAW SOME STOCK FOR YOUR PATCHWORK PIECES

Note: This project requires thin stock. We recommend resawing stock to the thicknesses specified in the Bill of Materials on page 22.

1 From a $\frac{3}{4} \times 5\frac{1}{2} \times 18$ " piece of stock, rip two strips to $\frac{1}{16}$ " wide. (We used mahogany.) Turn these strips 90° on your saw table, and rip two $\frac{1}{8} \times 1\frac{1}{16} \times 18$ " strips from the face of each for a total of four strips. From the edge of your original piece of stock, rip four $\frac{1}{8} \times \frac{3}{4} \times 18$ " strips.

2 From a $\frac{3}{4} \times 3\frac{1}{2} \times 18$ " piece of contrasting stock, rip three edge strips to $\frac{1}{8} \times \frac{3}{4} \times 18$ ". (We chose oak.) Save the remainder of this piece for the frame crosspieces and spacers.

3 Choose three additional contrasting hardwoods. (We selected walnut, cherry, and maple.) From a $\frac{3}{4} \times 3\frac{1}{2} \times 12$ " piece of each, rip six edge strips to $\frac{1}{8} \times \frac{3}{4} \times 12$ ".

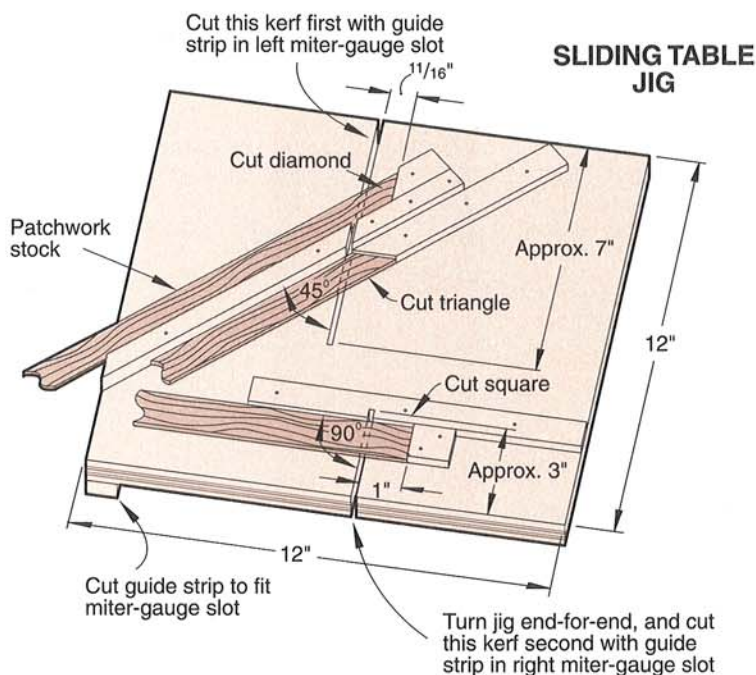
ONE JIG TAKES CARE OF ALL THREE GEOMETRIC SHAPES

1 To build the sliding table jig shown on page 19, start by cutting a 12" square of $\frac{1}{2}$ or $\frac{3}{4}$ " plywood. Then, cut a 12"-long strip of $\frac{1}{4}$ "-thick pine to the width of your tablesaw miter-gauge slots, and nail this strip to the bottom of your jig flush with one edge. Put the jig on your saw table with the guide strip in the left miter-gauge slot. Mount a 60- to 80-tooth trim blade on your saw, and start it. Slide the jig into the blade, cutting a kerf about 7" long. Now, turn the jig end-for-end, and insert the guide strip in the right miter-gauge slot. Cut a second kerf about 3" long.

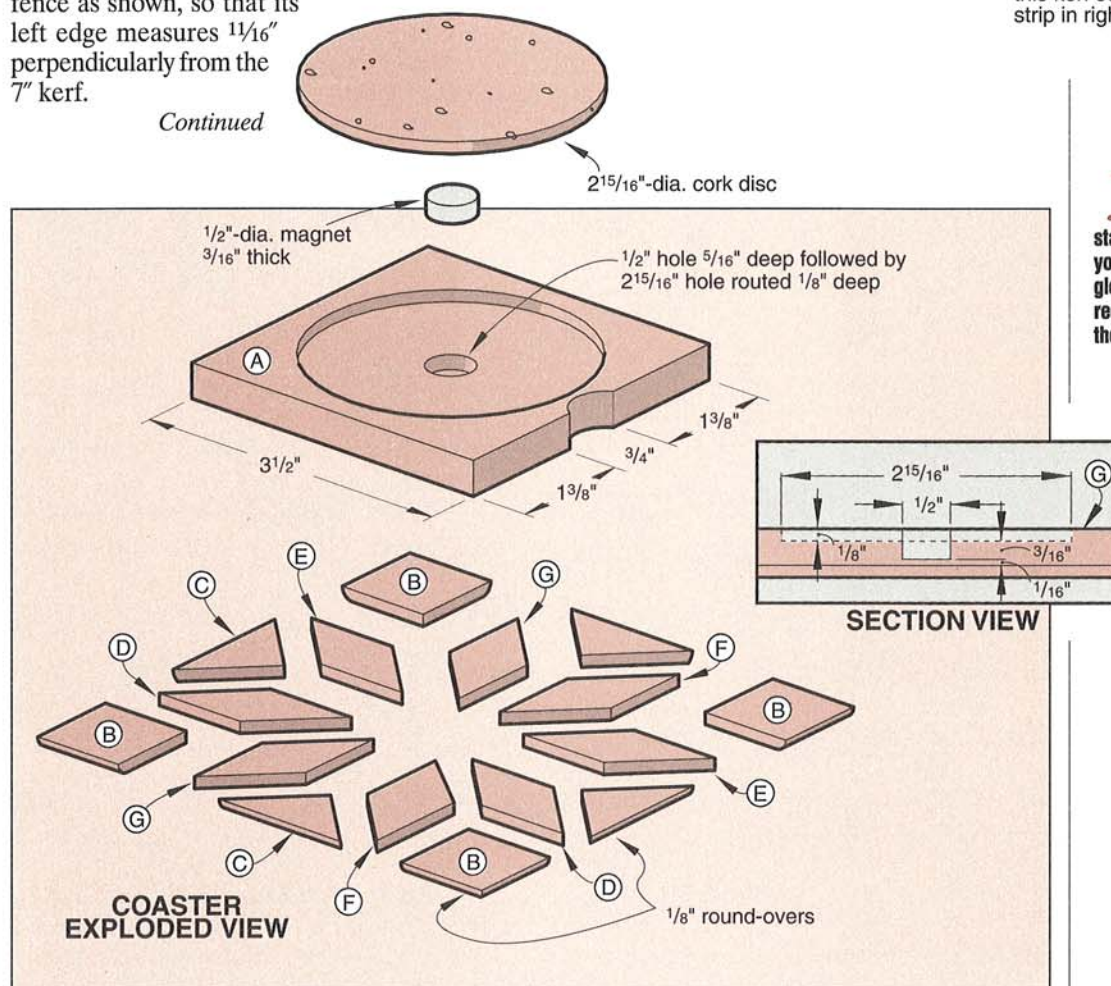
2 Cut three 12" strips of $\frac{1}{4} \times \frac{3}{4}$ " scrap pine for the jig fences and stopblocks. Tack one of them across the 7" kerf so that it intersects the kerf at a 45° angle. (We used $\frac{3}{4}$ " $\times$ 16 brads for all jig nailing.) Crosscut another strip to 9" long, and tack it across the 3" kerf at a right angle. Next, crosscut a 1"-long stopblock, and tack it against the fence 1" to the right of the 3" kerf to form a 90° angle.

3 For the triangle-cutting stopblock, cut a 45° miter at the middle of your third strip to make two mitered pieces. Tack one of these along the bottom edge of the long diagonal fence so that the tip of the mitered end is flush with the right edge of the 7" kerf.

4 Make the diamond-cutting stopblock by crosscutting the square end of the other mitered piece to about 3" long. Tack it along the top edge of the long diagonal fence as shown, so that its left edge measures $\frac{11}{16}$ " perpendicularly from the 7" kerf.



Continued



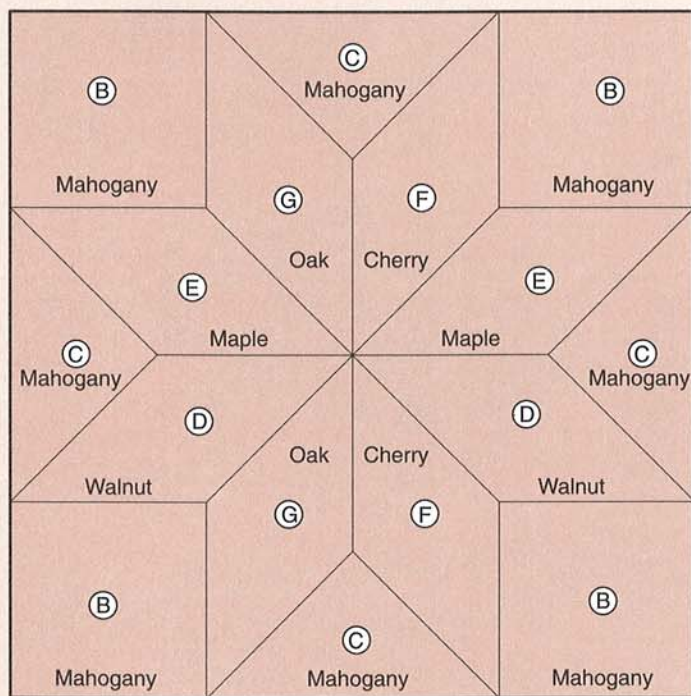
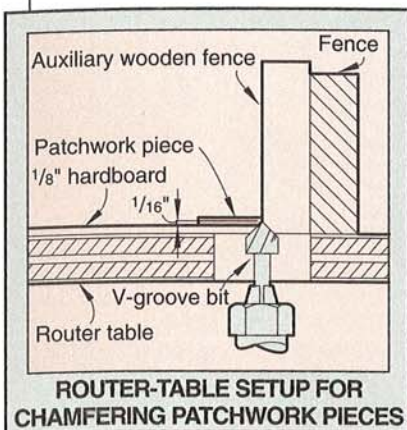
TIP To cut triangles and diamonds on the jig, start by mitering the square end of your $\frac{3}{4}$ "-wide strip. Then, for triangles, flip the strip over so that the reciprocal angle fits snugly against the stopblock.

QUILT COASTERS

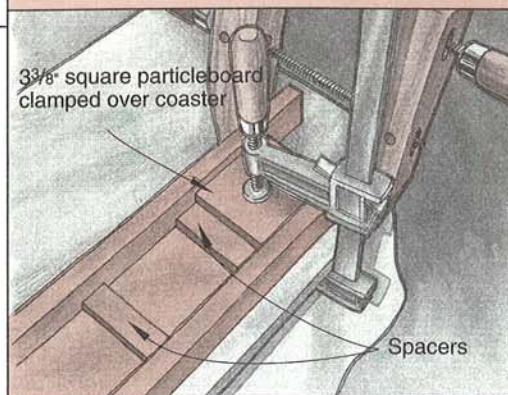
TIP We recommend chamfering the bottom as well as the top edges of your patchwork pieces because it will reduce glue squeeze-out considerably. For longer open time during patchwork assembly, we recommend white woodworker's glue.

5 To test your jig setup, cut four 1" lengths from a 1 1/16"-wide mahogany strip on the square-cutting jig. Turn each of them 90°, and rip it to 1" square. (*Note: For safety's sake, use an eraser-tipped pencil to manipulate the small pieces.*) On your triangle- and diamond-cutting jigs, cut four triangles from a 3/4"-wide mahogany strip, and cut two diamonds from a strip of each of your four other hardwoods.

6 Make the coaster bases (A) by first planing or resawing a 36" length of 3/4x3 1/2" pine stock to 3/8" thick and then crosscutting nine 3 1/2" squares. Dry-assemble your test pieces on one of them as shown on the Patchwork Arrangement drawing below. Check all three shapes for fit, and adjust the fence angles and stopblocks on your jig as necessary. When all the pieces fit together snugly, nail down the fences and stopblocks, and cut a total of 36 mahogany squares (B), 36 mahogany triangles (C), and 72 diamonds (18 from each of your four other contrasting hardwoods) for parts D, E, F, and G.



CLAMPING COASTERS INTO GLUING FORM



NOW, CHAMFER AND GLUE UP YOUR PATCHWORK PIECES

1 Chamfer the top and bottom edges of all patchwork pieces—except for the bottom and outside top edges of the squares and triangles—on your router table as shown in the drawing at left. Note that the center of the V-groove bit aligns with the edge of the auxiliary fence. For safety's sake, butt a piece of 1/8"-thick hardboard up against the auxiliary fence, and clamp it to the table. This will leave only 1/16" of router bit exposed. (We routed a couple of test pieces first to check the chamfer depth.)

2 To make a gluing form for the coasters, cut a 3 1/2"-wide strip and two 1 1/2"-wide strips from a 48" length of 3/4"-thick particleboard. Cut ten 1x3 1/2" spacers from 3/4"-thick particleboard. Now, cut nine 3 3/8" squares for clamping the patchwork pieces tightly to each coaster base. Screw the 1 1/2" strips to the edges of the 3 1/2"-wide strip, and nail your first spacer into the end of the form. Next, place a coaster base and a spacer snugly against the first spacer, and nail the spacer in place. Repeat until you've made spaces for all nine coasters in your form.

3 Now, glue up the patchwork pieces by first spreading a thin, even coat of glue on your coaster bases and then positioning the pieces according to the pattern. Clamp each coaster into the form using the 3 3/8"-square panels as shown above.

WE HAVE A JIG TO HELP WITH THE FLIP SIDE OF YOUR COASTERS, TOO

1 Remove the coasters from the form when the glue has dried, and sand the patchwork faces flat using 100-grit sandpaper. (We glued a full sheet of sandpaper to a scrap board.)

2 To create a recess for a magnet in each coaster, chuck a 1/2" Forstner bit into your drill press, and bore a 5/16"-deep hole in the center of each coaster back. (We clamped two

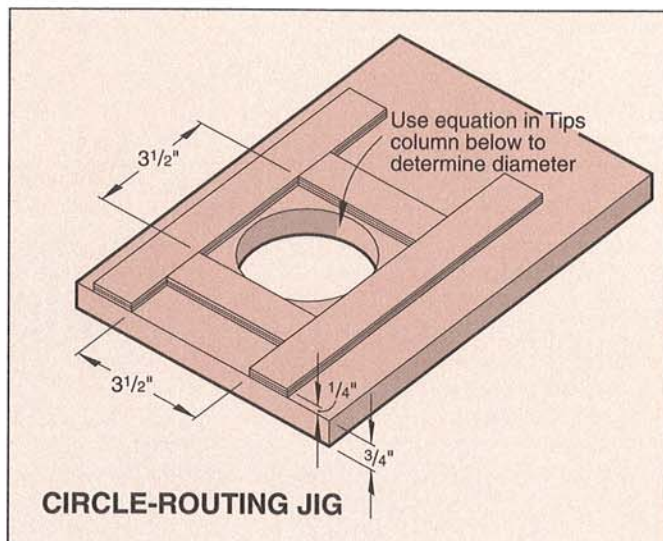
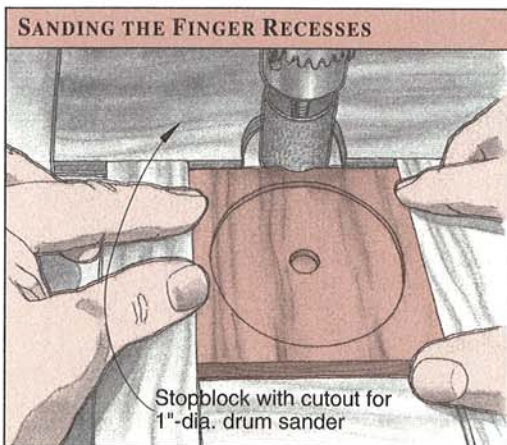
perpendicular straightedges to the drill-press table as a fence for the repetitive drilling.)

3 Next, build a circle-routing jig as shown at *right* to cut the recesses for the cork inserts. Start with a piece of $\frac{3}{4}$ "-thick particleboard cut generously to allow room for clamping. Chuck a circle cutter into your drill press, and set the diameter to fit your cork inserts. (See the easy equation in the Tips column for calculating this.) Cut the hole near the center of your $\frac{3}{4}$ "-thick plywood, then frame around it with the $\frac{1}{4}$ "-thick plywood strips.

4 Place a coaster panel in the jig, flip the jig over, and clamp it to your work bench. Fit your router with a $\frac{1}{2}$ " straight bit and a template guide bushing, and set the depth to $\frac{7}{8}$ ". Rout each coaster, and sand any router burr with your palm sander. (**Note:** If you don't have guide bushings for your router, see our *Buying Guide* for a set that is compatible with most of the popular round-based routers.)

5 Sand the patchwork face edges to prepare for rounding over. Set up your table-mounted router with a $\frac{1}{8}$ " round-over bit, round the face edges on all coasters, and sand again.

6 To sand the finger recess on the edge of the coasters, first clamp a scrap piece of plywood to your drill-press table. Chuck a 1"-diameter drum sander into the drill press, and position a coaster so that the drum will sand $\frac{3}{16}$ " into its edge. Nail fences along both sides of the coaster and a stopblock against the forward edge as shown *below*. Set the drum to clear the work surface by $\frac{1}{8}$ ", and sand a recess in the end-grain edge of each coaster base.



NOW, WALL-MOUNT YOUR WORK IN AN OAK AND MAHOGANY FRAME

1 To make the frame base (H), start by cutting a piece of $\frac{1}{2}$ "-thick birch plywood to $12\frac{1}{2}$ " square. Make the frame pieces (I) by ripping two $1 \times 13\frac{1}{2}$ " strips from the remainder of your $\frac{3}{4}$ "-thick mahogany stock. Rip two $\frac{1}{4}$ "-thick strips from the face of each, and miter-cut both ends of these four pieces to a length of 13". Dry-assemble the frame pieces and base to see that they fit snugly, and then glue and clamp them.

2 Next, cut the frame crosspieces (J) and spacers (K). To do this, rip seven $\frac{1}{4} \times \frac{3}{4} \times 13$ " edge strips from your leftover $\frac{3}{4}$ "-thick oak stock, then rip these to $\frac{1}{2}$ " wide. Measure the inside width of the framed base, and cut three crosspieces to length from the 13" strips. Now, finish-sand your coasters with 320-grit sandpaper, then measure them. Sand the crosspiece edges enough to allow the coasters $\frac{1}{32}$ " of vertical play. Measure your frame vertically, then crosscut 12 spacers to length, allowing for the width of the crosspieces. (We had to cut our spacers to $3\frac{1}{2}$ " because our crosspieces measured a full $\frac{1}{2}$ " wide.) Sand the spacer edges to allow the coasters $\frac{1}{32}$ " of horizontal play.

3 Now, dry-assemble all crosspieces, spacers, and coasters to check for fit. Adjust as necessary, then remove the coasters. Glue up the crosspieces and spacers, then clamp on a $12\frac{1}{4}$ " square of particleboard.

4 When the glue has dried, remove the clamps and board. Draw diagonals to find the centerpoint of each frame square, then bore a $\frac{3}{16}$ "-deep hole at each point using a $\frac{1}{2}$ " Forstner bit to accept the magnets.

Continued

TIP For our gluing form, we used poly-coated shelving stock (instead of plain particleboard) for its non-stick finish. We found it at a local home center.

TIP Figure out the diameter of your circle-routing jig hole (a) by adding the difference between the outside diameter of your template guide bushing (b) and your router-bit diameter (c) to the diameter of your cork discs (d):

$$a = (b - c) + d$$

For example, the difference between our $\frac{5}{8}$ "-diameter bushing (b) and our $\frac{1}{2}$ " straight bit (c) was $\frac{1}{8}$ ". We added this to our $2\frac{1}{16}$ " disc diameter (d) to get a $3\frac{1}{16}$ " total for our jig-hole diameter (a).

QUILT COASTERS

5 Finish-sand your frame with 320-grit sandpaper. Now, glue the magnets into their recesses on both the frame and the coasters with quick-set epoxy. (**Note:** *Be sure to orient the frame magnets so they attract rather than repel those in the coasters.*) Apply the finish of your choice. (We sprayed on two coats of Minwax Fast-Drying Satin Polyurethane, sanding between coats.) When the finish has dried, mount a cork disc in each coaster.

6 To wall-mount the frame, lay out two points 4" down from the top and 2" in from either side of the back. Rout a 1/4" keyhole slot 3/8" deep at each point. Measure the center-to-center distance between the holes, and mount a pair of #10 expansion bolts in the wall at corresponding locations. Unscrew the bolts enough to hang your frame. ■

Project design: James R. Downing
Illustrations: Roxanne LeMoine,
Carson Ode
Project builder: Chuck Hedlund

BILL OF MATERIALS					
Part	Finished Size			Matl.	Qty.
	T	W	L		
A coaster bases	3/8"	3 1/2"	3 1/2"	P	9
B squares	1/8"	1"	1"	MG	36
C triangles	1/8"	3/4"	1 1/2"	MG	36
D diamonds1	1/8"	3/4"	1 7/8"	W	18
E diamonds2	1/8"	3/4"	1 7/8"	M	18
F diamonds3	1/8"	3/4"	1 7/8"	C	18
G diamonds4	1/8"	3/4"	1 7/8"	O	18
H base	1/2"	12 1/2"	12 1/2"	BP	1
I frame	1/4"	1"	13"	MG	4
J crosspieces	1/4"	1/2"	12 1/2"	O	4
K spacers	1/4"	1/2"	3 1/2"	O	12

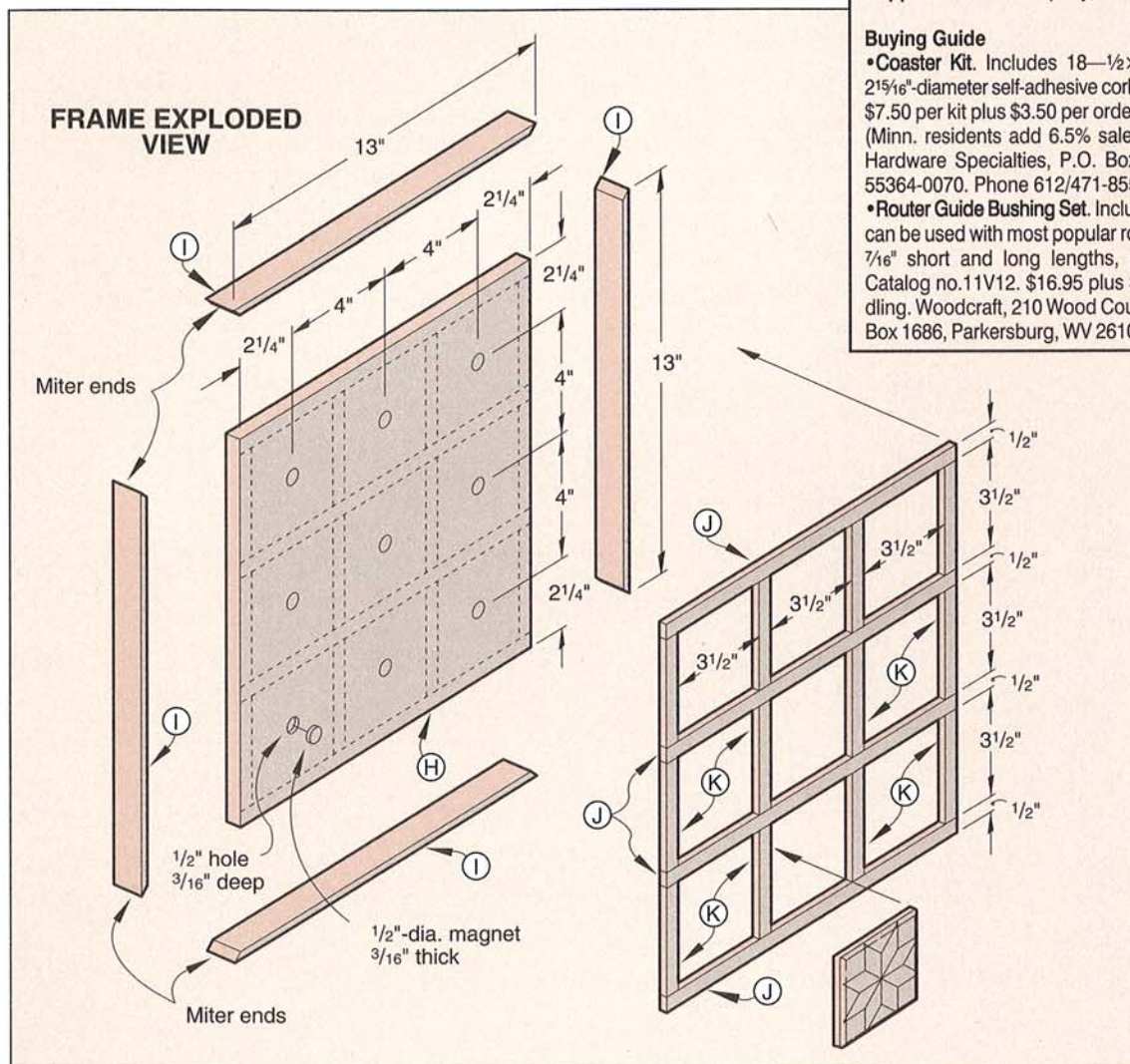
Materials Key: P—Pine; MG—Mahogany; W—Walnut; M—Maple; C—Cherry; O—Oak; BP—Birch Plywood.

Supplies: Quick-set epoxy, finish, #10 expansion bolts.

Buying Guide

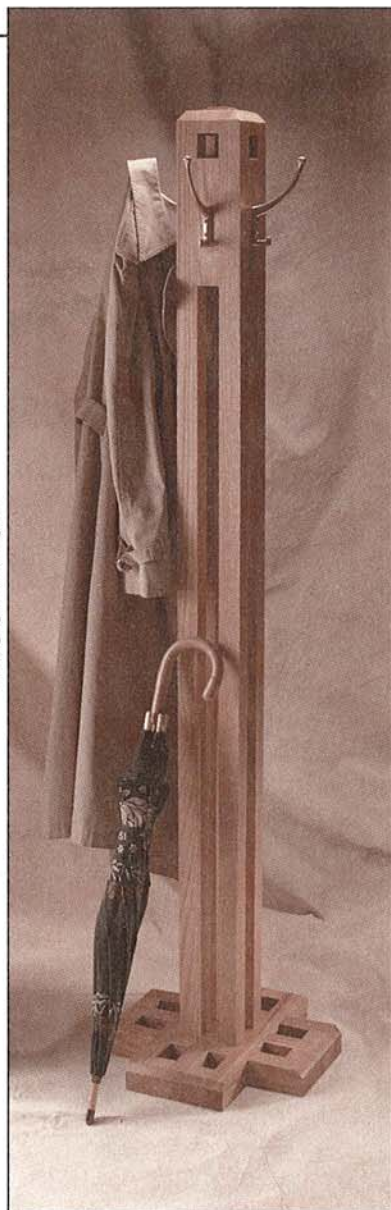
• **Coaster Kit.** Includes 18— $\frac{1}{2} \times \frac{3}{16}$ " magnets and 9— $2\frac{1}{16}$ "-diameter self-adhesive cork discs. Catalog no. 2346. \$7.50 per kit plus \$3.50 per order shipping and handling. (Minn. residents add 6.5% sales tax per order.) Meisel Hardware Specialties, P.O. Box 70-WEW, Mound, MN 55364-0070. Phone 612/471-8550.

• **Router Guide Bushing Set.** Includes a universal plate that can be used with most popular round-based routers, 5/16", 7/16" short and long lengths, and 5/8" bushing sizes. Catalog no. 11V12. \$16.95 plus \$4.00 shipping and handling. Woodcraft, 210 Wood County Industrial Park, P. O. Box 1686, Parkersburg, WV 26102. Phone 800/225-1153.



*A classy
coat tree in
the mission
style*

Photograph: Wm. Hopkins



Pillar of Hospitality

If your front entryway could use a bit of dressing up, give this project a second glance. The mission styling offers a warm welcome but also provides a rock-steady station for heavy outerwear.

Note: This design complements five mission-styled pieces featured in previous issues: a bookcase (Issue 7), a telephone table (Issue 19), a coffee table (Issue 22), a wall clock (Issue 27), and a library table (Issue 29). You may order back issues for \$5.95 each. Write: Weekend Woodworking Projects®, P.O. Box 9266, Des Moines, IA 50306-9266.

LAMINATE YOUR STOCK, THEN BEGIN WITH THE BASE

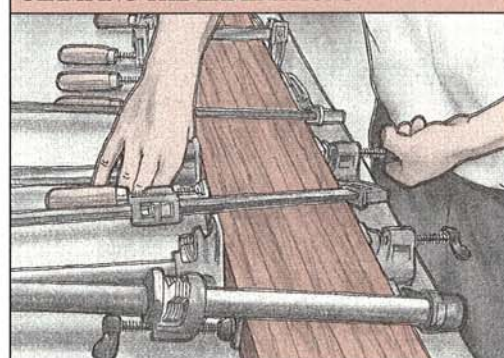
1 From $\frac{3}{4} \times 7\frac{1}{4} \times 72$ " stock, rip four strips to $1\frac{1}{16} \times 72$ ". From an 84" length of the same material, rip four strips to $1\frac{1}{16} \times 84$ ". Rip three strips to $2\frac{1}{16} \times 84$ " from a second $\frac{3}{4} \times 7\frac{1}{4} \times 84$ " piece. (We added an extra $\frac{1}{16}$ " to the width of all strips to allow for planing. In keeping with classic mission styling, we selected white oak.) Then, crosscut one of the $2\frac{1}{16}$ "-wide pieces in half. Group all 12 strips in pairs, glue each pair face-to-face, and clamp overnight as shown below. Scrape off any glue squeeze-out, and edge-plane the $1\frac{1}{16}$ "- and $2\frac{1}{16}$ "-wide pieces to $1\frac{1}{2}$ " and 2" respectively. Sand the faces and edges with 150-grit sandpaper.

2 Crosscut four uprights (A) to 66" from the $1\frac{1}{2}$ "-wide laminated strips and six base pieces (B) to 16" from the 2"-wide laminated strips. Lay out and cut three dados $1\frac{1}{2}$ " wide and 1" deep on the edge of each base piece where shown on the Base drawing on page 24. (We used a $\frac{3}{4}$ " dado set on our radial-arm saw and tested our depth setting on a piece of scrap before cutting the dados.)

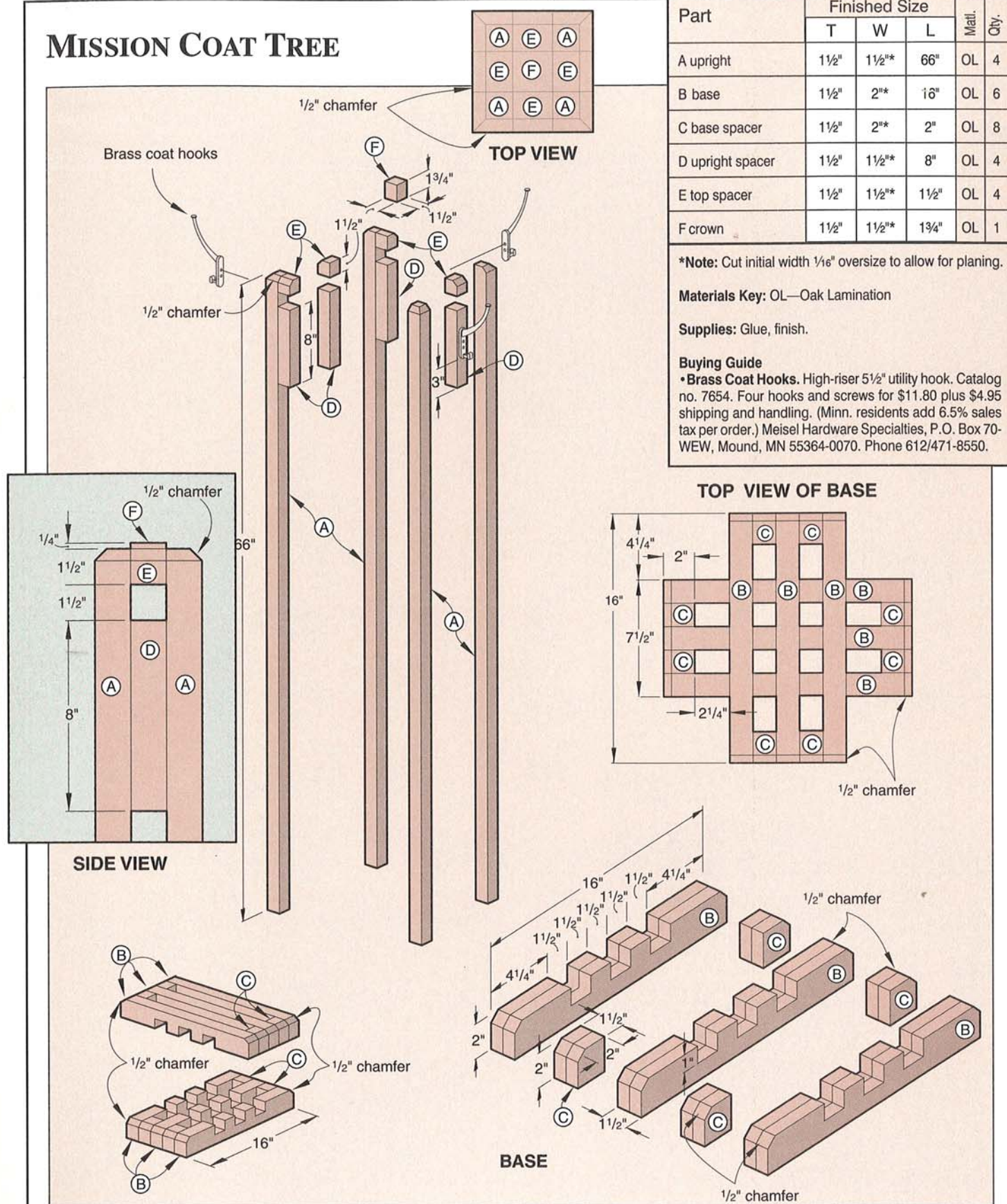
3 Dry-assemble the six base pieces to form the grid as shown on page 25. Sand the dados to fit, and number both ends of each piece so

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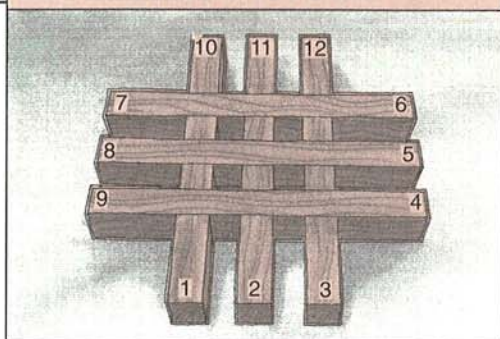
CLAMPING THE LAMINATIONS



MISSION COAT TREE



DRY-ASSEMBLING THE BASE



you can reassemble them in the same position. Measure the space between each pair of pieces, and crosscut eight spacers (C) from your 2"-wide laminated stock to fit each of the spaces. Number these so you can reassemble the grid. Now, glue and clamp all pieces to form the base.

PUT THE PILLAR TOGETHER AND CHAMFER THE TOP AND BASE

1 Fit the four uprights (A) into the four center cells in the base, and sand if necessary to fit. Number each upright so it will always go into the same cell. Crosscut four upright spacers (D) and four top spacers (E) from your leftover 1½"-wide laminated stock.

2 Now, lay the assembled uprights and base on your bench. Dry-assemble the top ends of the uprights with both sets of spacers, check for fit, and mark all mating surfaces. Glue a set of spacers (one D and one E) into opposite sides of the upright assembly, and clamp. When the glue has dried, unclamp the assembly, and turn it 90°. To complete the pillar, glue spacers into the other two sides, and clamp as shown above.

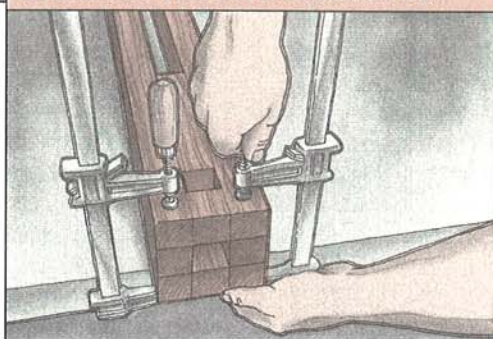
3 Remove the pillar from the base. Now, cut 3/4" chamfers into all sides of the pillar top and on the top of each base part end as shown on the Side View and Base drawings at left. (We clamped a wooden auxiliary fence to our table-saw rip fence and tilted the blade into the fence to an angle of 45°. We also clamped an extension to our miter gauge to support the pillar.)

4 From leftover 1½×1½" laminated stock, crosscut the crown (F) to 1¾" long. Insert it into the center cell in the top of the upright assembly, and check for fit. Sand as necessary. Glue the crown in place, allowing it to extend ¼" above the top of the uprights.

NOW, FINISH YOUR MISSION BEFORE YOU HANG THE HOOKS

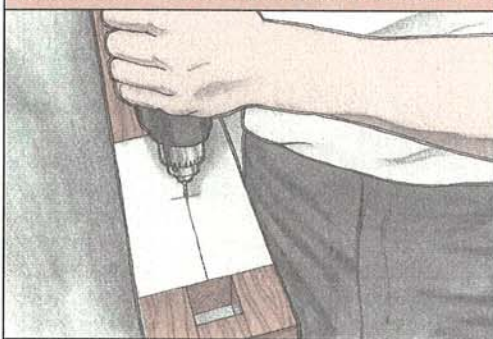
1 Scrape off excess glue from all parts, and finish-sand the base and pillar assemblies. (Note: If you prefer to glue the pillar into the base for increased stability, do so at this point.)

CLAMPING THE PILLAR ASSEMBLY



TIP When adding the spacers to the pillar top, we found it was neater and easier to glue and clamp just two sides at a time. You can do all four sides in one step, but you need to work quickly before the glue sets. Also, use a 1½×1½×12" spacer block in the center cell of the pillar to keep the spacers in position while you clamp. Be sure to remove the spacer block immediately after clamping.

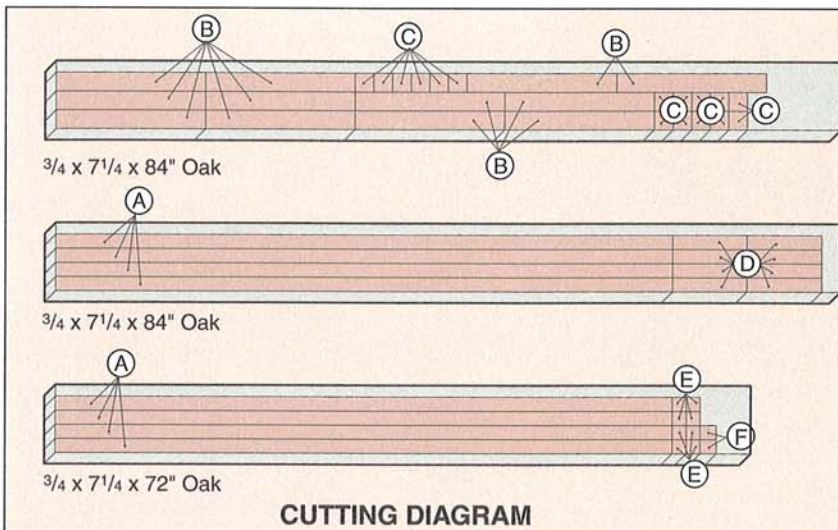
DRILLING THE COAT-HOOK HOLES



TIP You may want to attach rubber pads or leveling feet to the base if you intend to place your tree on a bare floor.

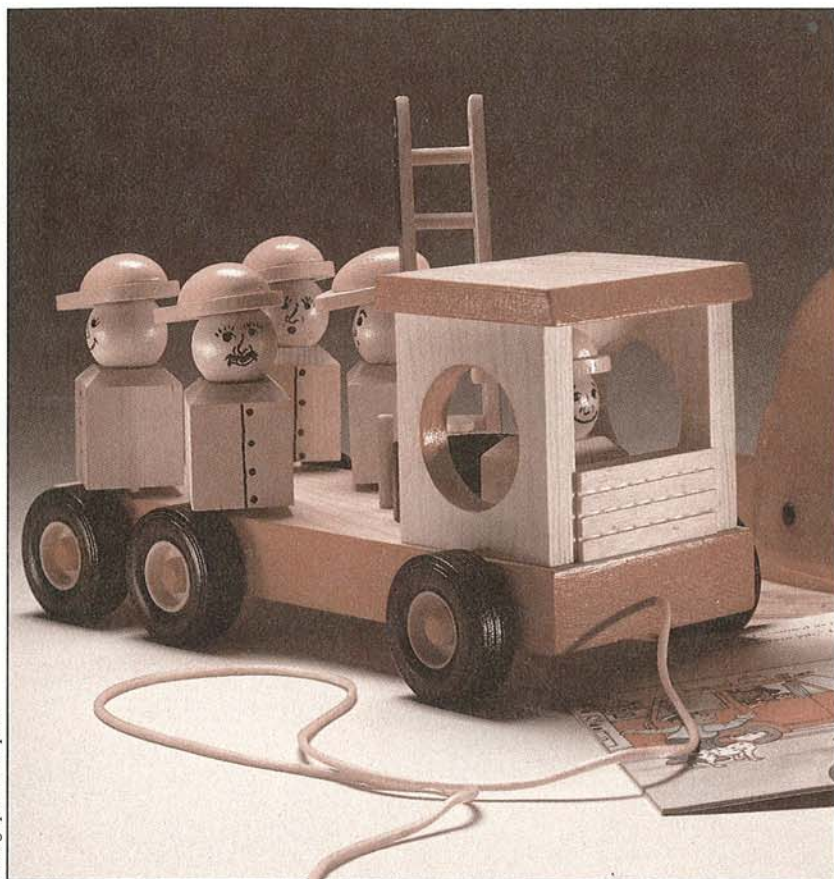
2 Screw on four coat hooks approximately 3" below the 1½"-square opening on each side of the pillar. (We made a cardboard template and taped it to each side as shown above before drilling the pilot holes. See the Buying Guide for our choice of coat hooks.) Insert the pillar into the base, making sure you match each upright with its respective cell. ■

Project design: Cary Stage, Reedsburg, Wis.
Illustrations: Roxanne LeMoine, Carson Ode
Project builder: Brad Sommers



CUTTING DIAGRAM

High-Revvin' Hook 'n' Ladder



Photograph Wm. Hopkins

No batteries required for these heroes of the hydrant. The free-spinning crew members sit right atop the rear wheels, so when your future firefighter rushes off to the blaze, this pull toy twirls with color. The design comes from John and Diane Denkinger of Omaha, who garnered well-deserved honors in *WOOD*® magazine's Build-A-Toy® contest.

BUILD THE BASIC TRUCK FIRST

Note: Trim off the rounded mill edges from all stock before cutting pieces to size.

1 Plane or resaw 2×6 stock to 1½" thick. (We used clear pine.) Rip and crosscut a 4×11" piece for the truck base (A), then lay out centerpoints for the axle, dowel, and pull-cord holes where shown on the Truck Base drawing and Front Hole detail at right. Mark with an awl, and drill the holes. (A word of caution: Since actual dowel diameters vary these days, we measured our dowels before drilling and adjusted hole diameters accordingly. We used brad-point bits and clamped a fence to our drill-press table for the repetitive drilling.) Now, sand all surfaces with 150-grit sandpaper.

Note: Painting the parts before assembling them makes for a much neater finished product. We used Liquitex Acrylics' Brilliant Yellow, Naphthol Crimson, and Mars Black, followed by a coat of Deft spray finish. For the faces, we used an indelible black felt-tip marker. You can buy all of these at art-supply or crafts stores.

2 To build the cab, cut a 24" length of ¾×5½" stock, and resaw or plane it to ½" thick. Then, rip and crosscut a 4×4" square. Tilt your table-saw blade to cut the 15° bevel for the roof (B), and bevel-cut one end using your miter gauge. Crosscut the other end to 3½" long.

3 Cut the sides (C) from ½"-thick stock to the dimensions listed in the Bill of Materials. Stack the two sides using double-faced tape, and mark the centerpoint for the window. With a circle cutter, cut a 2"-diameter hole. (We set our drill press at 500 rpm). Separate the two sides, and sand the window openings. (We chucked a 1½"-diameter sanding drum into our drill press.)

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BILL OF MATERIALS

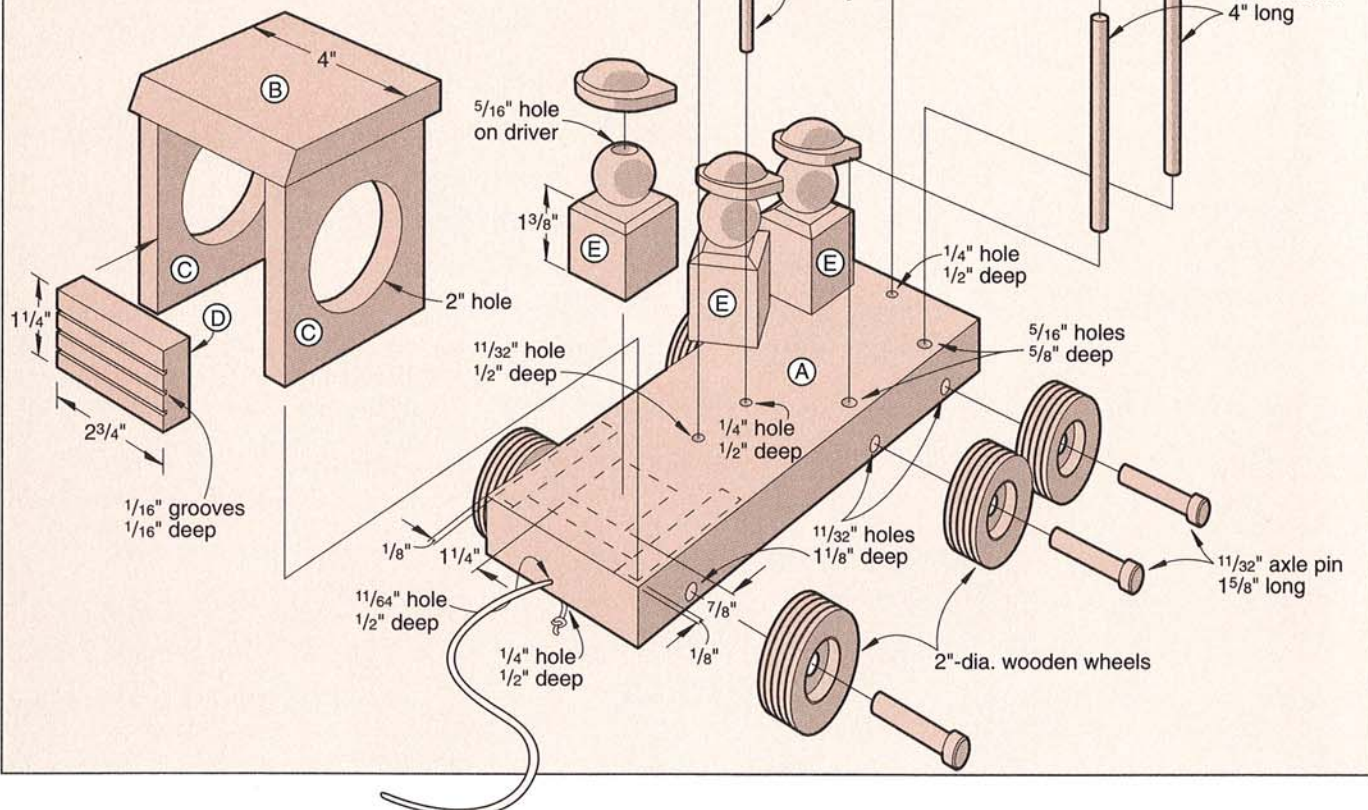
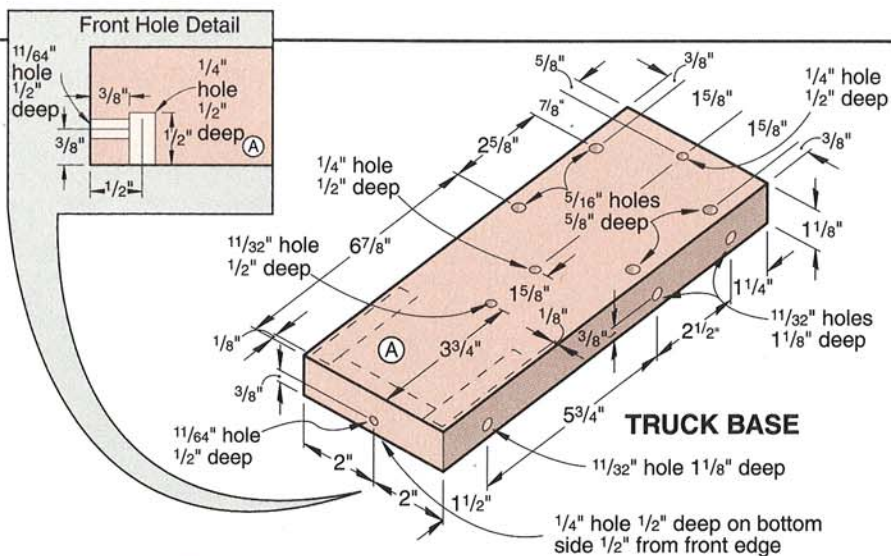
Part	Finished Size			Matl.	Qty.
	T	W	L		
A truck base	1 1/8"	4"	11"	P	1
B roof	1 1/2"	4"	3 1/2"	P	1
C sides	1 1/2"	3"	3 1/4"	P	2
D grille	1 1/2"	1 1/4"	2 3/4"	P	1
E firefighter bodies	1 1/2"	1 1/2"	1 3/4"	P	5
F helmet brims	1/4"	1 1/2"	2"	P	5
G stringers	1/4"	3/4"	6"	P	2
H ladder stand	1 1/2"	1 7/8" dia.		PL	1

Materials Key: P—Pine; PL—Pine Lamination

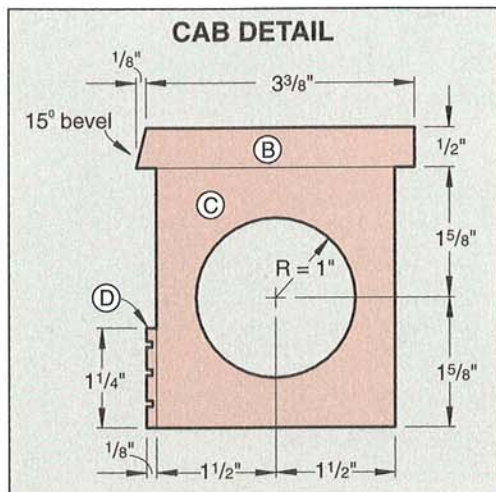
Supplies: acrylic enamels; black felt-tip marker; 3/16, 1/4, and 5/16" dowels; 1/8" braided nylon; finish.

Buying Guide

•**Fire Truck Parts Kit.** Includes 5—1 1/4" ball knobs, 3—1 5/8" eggs, 5—1 1/32×1 5/8"-long axle pins, 6—2" tread-groove wheels, 1—3/4" ball. Catalog no. 2931. \$7.95 per kit plus \$3.50 shipping and handling. (Minn. residents add 6.5% sales tax.) Meisel Hardware Specialties, P.O. Box 70-WEW, Mound, MN 55364. Phone 612/471-8550.



HOOK 'N' LADDER

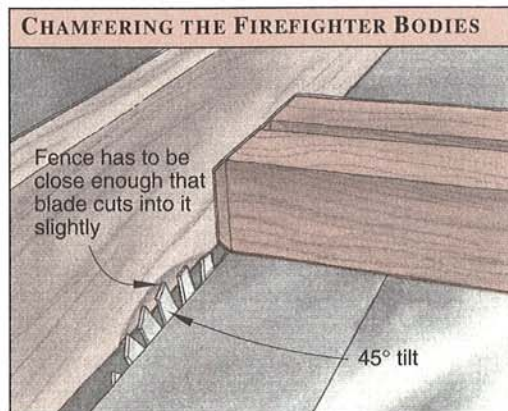


TIP To drill the 1 1/32" dowel holes in the firefighters, we started with a 5/16" brad-point bit because most brad-point bit sets don't include an 1 1/32". Then, we enlarged the holes with an 1 1/32" twist bit.

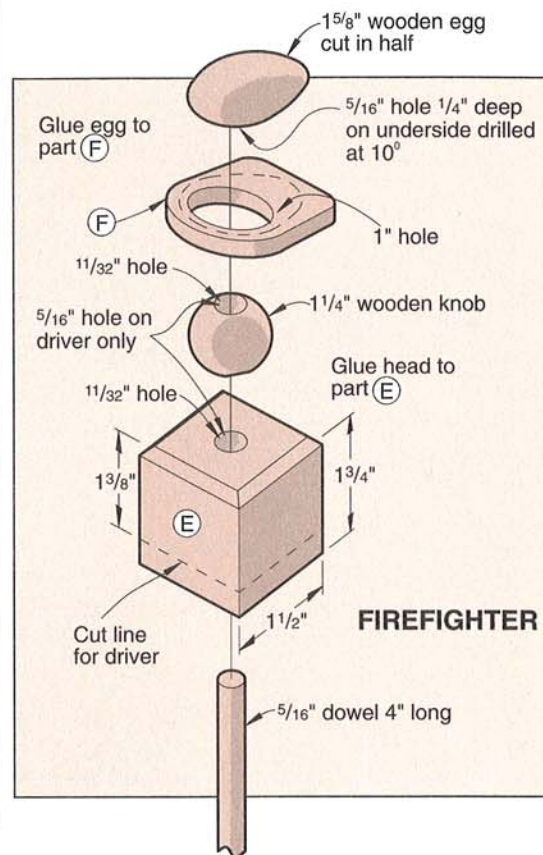
4 From your resawn 1/2" x 5 1/2" stock, cut a 2 3/4"-long piece for the grille (D). (The finished grille width will be 1 1/4", but we kept the 5 1/2" width at this point to provide a safer handhold during bandsawing.) Starting 3/8" from the bottom edge of the grille, mark three parallel lines 5/16" apart for the detail grooves. Using your miter gauge for support, bandsaw these grooves 1/16" deep. Rip the grille to a finished width of 1 1/4", and sand it. Now, sand all surfaces of the other cab pieces, glue up the cab, and clamp. (We saved a piece of 2 3/4"-long scrap to use as a spacer at the rear of the cab during clamping.)

FASHION YOUR FIREFIGHTERS FROM BASIC GEOMETRICAL SHAPES

1 To make the firefighter bodies (E), first rip a 1 1/2 x 1 1/2 x 24" piece from your 2 x 6 stock. Tilt your tablesaw blade to 45°, and clamp a scrap 2 x 4 to your rip fence. Set this wooden fence close enough to chamfer the top 1/4" of your firefighter bodies. Your blade should cut slightly into the fence as shown below. Now, chamfer both ends



on all four sides using your miter gauge. Crosscut these ends to 1 3/4", then chamfer the new ends, and repeat the crosscuts. (We made the crosscuts on our bandsaw to avoid disturbing our chamfering fence.) Finally, chamfer one more end, and crosscut this piece to 1 3/8" for the driver's body. Sand all surfaces. (We used a 1" sanding belt to smooth the chamfer cuts.)



2 Draw diagonals to mark the centerpoint on the chamfered end of each body. Secure each piece to your drill-press table, and drill an 1 1/32" hole through the four longer blocks and a 5/16" hole through the driver. (We used a handscrew clamp laid flat to hold the piece and a second clamp to secure the first clamp to the table.)

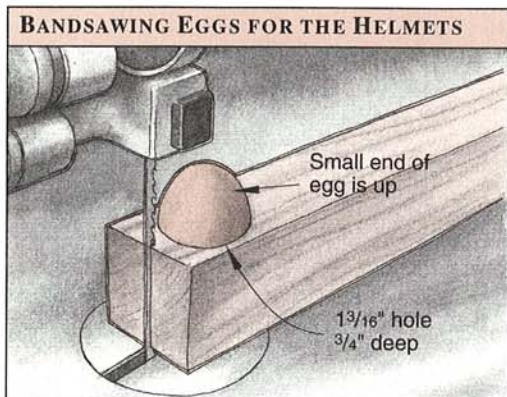
3 To form the heads, clamp an 8"-long piece of 2 x 2 to your drill-press table, and drill a 1 3/16" hole 1" deep near one end. Then, drill through the piece (on the same centerpoint) with a 7/32" bit. Insert a 1 1/2" length of 3/16" dowel into the predrilled hole in one of your wooden knobs, and insert the knob into the jig so the dowel goes through the hole in the bottom. (This will keep

the flattened side perpendicular to the drill.) Drill through each knob using a $\frac{5}{16}$ " brad-point bit. Next, glue a knob flat side down to each of the five blocks using a scrap piece of $\frac{1}{4}$ " dowel to align the two holes. When the glue has dried, clamp each firefighter *except for the $\frac{1}{8}$ " driver* in a handscrew clamp secured to the table, and enlarge the existing holes in the body and head with an $\frac{11}{32}$ " twist bit.

4 Cut a 4" length of $\frac{5}{16}$ " dowel, and glue it into the hole in the driver's body. Sand it flush on the bottom. It should protrude above the head (to be cut to length later).

A COUPLE OF SIMPLE JIGS HELP YOU HANDLE THE HELMETS

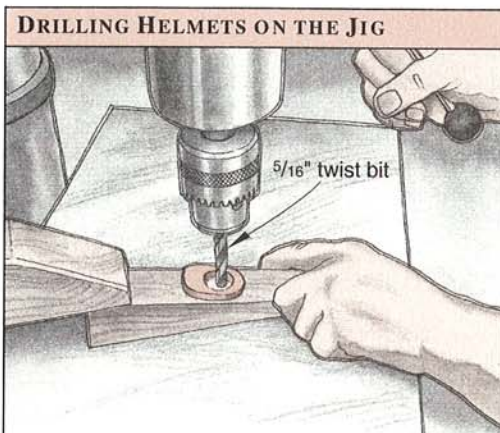
1 To make an egg-cutting jig that you'll need to make the helmets, mark a centerpoint $1\frac{1}{2}$ " in from the unused end of your knob-drilling jig. Drill a $\frac{13}{16}$ " hole $\frac{3}{4}$ " deep. (We used a Forstner bit at 1,000 rpm.) Clamp a fence to your bandsaw table, and insert the large end of a wooden egg into the hole. Slowly bandsaw the egg in half lengthwise as shown *below*, and sand the sawed faces flat. Repeat for the other two eggs.



2 Resaw a 24" length of $\frac{3}{4} \times 5\frac{1}{2}$ " stock to $\frac{1}{4}$ " thickness. Transfer five copies of the full-sized Helmet Brim pattern *at right* including the egg outline and the centerpoint. (We used carbon paper.) Next, chuck a 1" Forstner bit into your drill press, and drill the hole in each brim (F) as marked. Then, cut out the brims on your scrollsaw. Sand all surfaces using 150-grit sandpaper. Glue an egg half to each brim, and clamp.

3 Next, build a jig for drilling the helmets. Rip a 10° taper on one side of a 6" scrap of 2×2. Trace the Helmet Brim pattern (including the

egg outline) onto the tapered face about halfway from the end, with the front of the helmet facing down the taper. Drill a hole inside the egg outline on the jig to start your scrollsaw cut, and cut out the egg shape. Mark the centerpoint as shown on the pattern on the inside of one of the helmets. Place the helmet upside down in the jig hole, position the centerpoint under the drill, and clamp the jig to your table. Now, drill a $\frac{5}{16}$ " hole $\frac{1}{4}$ " deep in each helmet as shown *below*.



NOW, ADD THE LADDER AND LADDER STAND

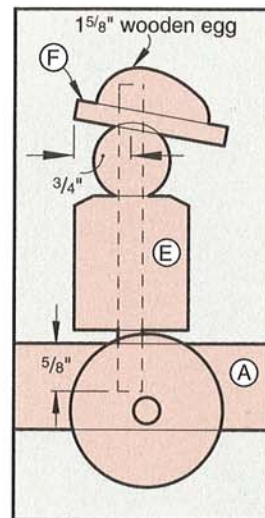
1 For the ladder stringers (G), rip and cross-cut two strips of your resawn $\frac{1}{4} \times 5\frac{1}{2}$ " stock to the dimensions listed in the Bill of Materials. Stack the stringers using double-faced tape, lay out the two $\frac{5}{16}$ " holes for the ladder posts, and drill. (We used a brad-point bit.)

2 To add the rungs, separate the stringers, and chuck a $\frac{1}{4}$ " Forstner bit into your drill press. Lay out the holes where shown on the Ladder drawing on *page 30*, and drill them $\frac{1}{8}$ " deep. (We set our drill at 2,400 rpm.) Taper the stringer ends slightly, and sand all surfaces. Cut five $1\frac{1}{8}$ "-long rungs from $\frac{1}{4}$ " dowel, glue them between the stringers, and clamp.

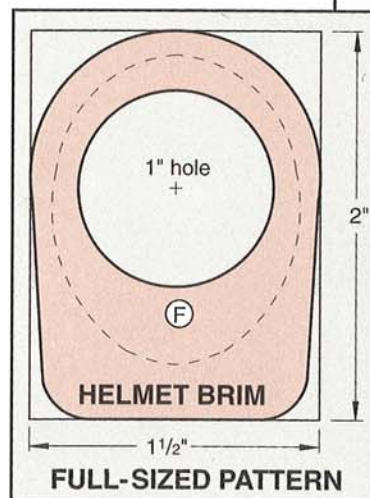
3 Cut two $1\frac{7}{8}$ " lengths of $\frac{1}{4}$ " dowel for the ladder posts, and round one end of each with a sanding belt. Then, glue the other ends into the appropriate holes where shown on the Exploded View drawing.

4 Near the end of a $3\frac{1}{2} \times 12$ " piece of $\frac{3}{4}$ "-thick stock, draw a $1\frac{7}{8}$ "-diameter circle for the ladder stand (H). Cut out this disc on your

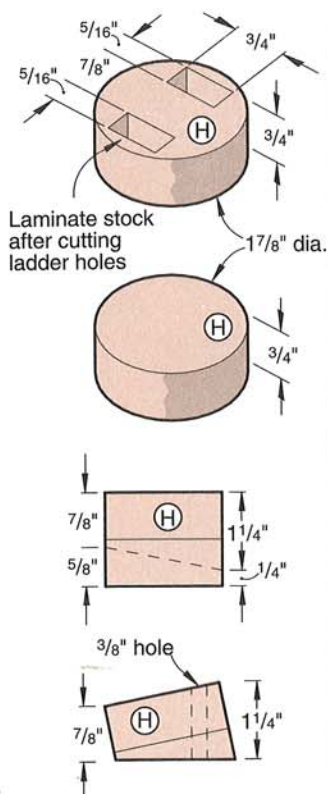
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TIP To cut the 10° taper in your helmet-drilling jig, use a 15" wooden extension on your tablesaw miter gauge, set the gauge at 10° from square, and place the end of your 6" piece squarely against the extension before ripping.



HOOK 'N' LADDER



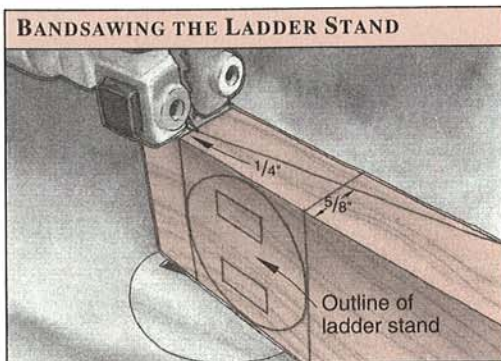
LADDER STAND

TIP Before driving in the axle pins, we cut thin cardboard shims to keep about 1/32" between the wheels and the base.

Project design: John and Diane Denkinger, Omaha, Neb.
Illustrations: Roxanne LeMoine, Carson Ode
Project builder: Don Wipperman

scrollsaw, keeping the blade outside the line, then sand to the line. (We used a 1" sanding belt.) Lay out the ladder slots where shown on the Ladder Stand drawing at left. Drill start holes in the slots, and cut them out on your scrollsaw. (*Note: Measure the finished dimensions of your ladder before cutting the slots, and adjust the slot dimensions as necessary so the ladder won't lean excessively.*)

5 Trace the circular top piece (including the slots) onto the other end of this same piece of stock as shown below. Using your combina-



tion square, draw a perpendicular line across the piece at either edge of the circle. Continue these lines down one side, and mark them at 1/4" and 5/8" from the top respectively. Connect the marks to make a cross-sectional taper, and cut this taper with your bandsaw.

6 Re-attach the waste from the taper cut using double-faced tape, and crosscut the piece along the two perpendicular lines. Now, align the slots in the top piece with the traced slots on the bottom piece. Glue and clamp the two pieces. Let the glue dry, then trim away the waste on the bottom piece by cutting around the top-piece perimeter with your scrollsaw. Remove the taped-on waste piece, and sand all surfaces. Draw a line flush with the tops of the ladder slots. Mark the center of this line, and clamp the ladder stand to your drill-press table. Drill a 3/8" hole through the ladder stand using a brad-point bit. (*Note: The hole should be perpendicular to the bottom of the ladder stand—not to the top.*)

CHECK THE MOVING PARTS BEFORE FINAL ASSEMBLY

1 Before gluing any of the moving-part assemblies, check the fit and action of your firefighters. To do this, insert axle pins through the wheels, and drive them into the base using a hammer and a piece of dowel.

2 Cut four 5/16" dowels to 4", and insert them into the appropriate holes on the truck base. Next, place a firefighter on each, and fit a helmet onto each dowel (all without glue). With the weight of the truck resting on the wheels, each helmet must clear the head so the firefighter will turn freely. Adjust the dowel lengths, then glue on the helmets, reassemble the firefighters, and glue the dowels into the truck base.

3 Now, fit your driver (who doesn't spin) with a helmet. Adjust the dowel length so the helmet will fit snugly on the head, and glue the helmet to the dowel. When the glue has dried, glue and clamp the driver to the truck base. Now, sand an axle pin, and insert it through the ladder stand and into the truck base. Check to make sure the stand rotates freely, then glue the pin into the base. Finally, glue and clamp the cab to the base.

4 Knot a 3' length of 1/8" braided nylon for a pull cord, and thread it through the hole. Drill an 1 1/64" hole through a small wooden ball, and knot it onto the other end of the pull cord. ■

