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Bill Krier
Editor
WOOD® magazine

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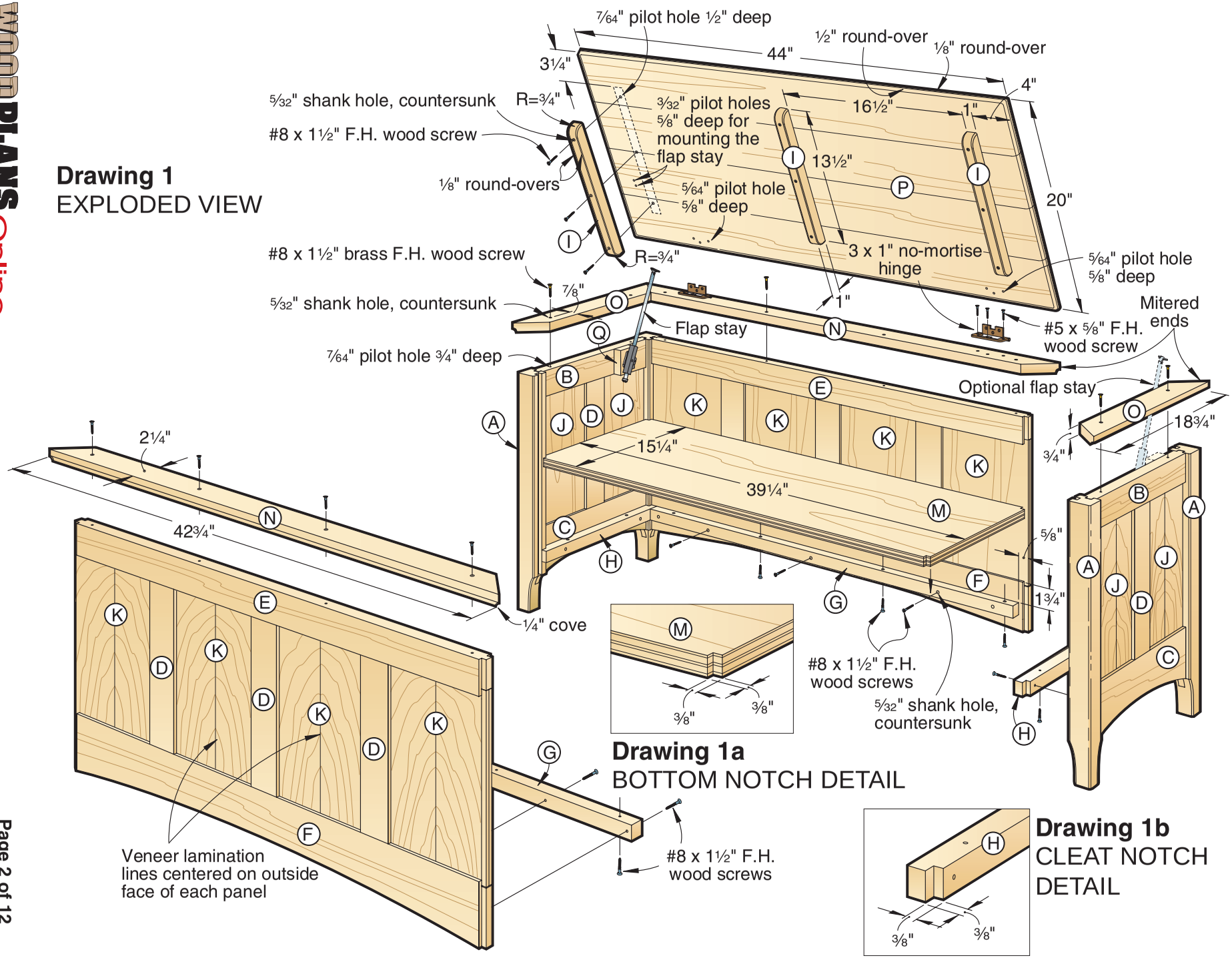
Heirloom Hope Chest

Looking for a handsome, functional project that won't overtax your woodworking skills? Here's one, and it makes a wonderful storage or hope chest. You'll find the construction of this piece strictly straightforward, with groove-and-tenon joints you cut with only a tablesaw. Blankets, toys, or family keepsakes will never have a more beautiful home.

Drawing 1
EXPLODED VIEW



Drawing 1a
BOTTOM NOTCH DETAIL

Drawing 1b
CLEAT NOTCH DETAIL

materials list

Part	FINISHED SIZE T	W	L	Matl.	Qty.
A legs	1¾"	1¾"	20½"	W	4
B side top rails	1"	2¼"	15¼"	W	2
C side bottom rails	1"	4"	15¼"	W	2
D stiles	1"	2½"	12"	W	8
E front/back top rails	1"	2¼"	39¼"	W	2
F front/back bottom rails	1"	4"	39¼"	W	2
G front/back cleats	1"	1"	37¼"	W	2
H side cleats	1"	1"	15¼"	W	2
I top cleats	1"	1"	13½"	W	3
J side panels	½"	6 11/16"	11 15/16"	LCP	4
K front/back panels	½"	8 7/16"	11 15/16"	LCP	8
L* filler strips	⅜"	½"	3"	W	8
M bottom	¾"	15¼"	39¼"	CP	1
N* front/back top trim	¾"	2¼"	42¾"	W	2
O* side top trim	¾"	2¼"	18¾"	W	2
P* top	¾"	20"	44"	EW	1
Q filler block	½"	2¼"	2¼"	W	1

*Parts initially cut oversize. See the instructions.

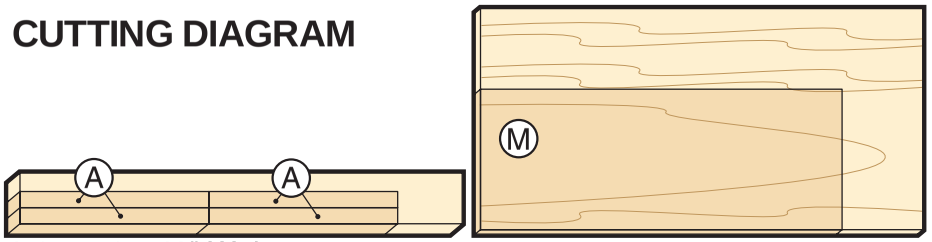
Materials Key: W–walnut, CP–cherry plywood, EW–edge-joined walnut, LCP–laminated ¼" cherry plywood.

Supplies: #8×1½" flathead wood screws, #8×1½" brass flathead wood screws, #5×⅝" flathead wood screws, ¼" hardboard, spray adhesive, glue, clear finish.

Buying Guide

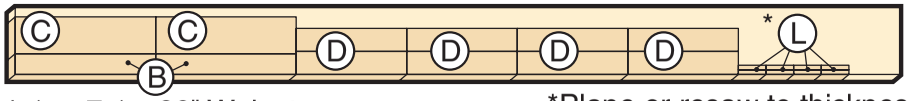
Hardware. 3×1" no-mortise hinges no. 00H51.04, $2.50 per pair; flap stay no. 00U06.01, $11.90 per stay. Order from Lee Valley Tools, P.O. Box 1780, Ogdensburg, NY 13669, call 800/871-8158, or go to www.leevalley.com.

CUTTING DIAGRAM



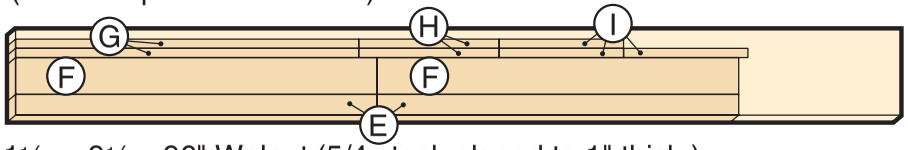
1¾ x 5½ x 48" Walnut

¾ x 24 x 48" Cherry plywood

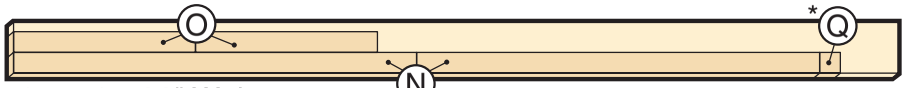


1 1/16 x 7¼ x 96" Walnut (5/4 stock planed to 1" thick.)

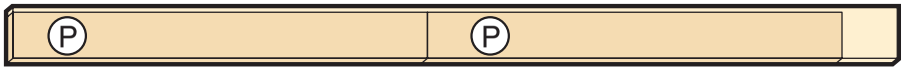
*Plane or resaw to thickness listed in the Materials List.



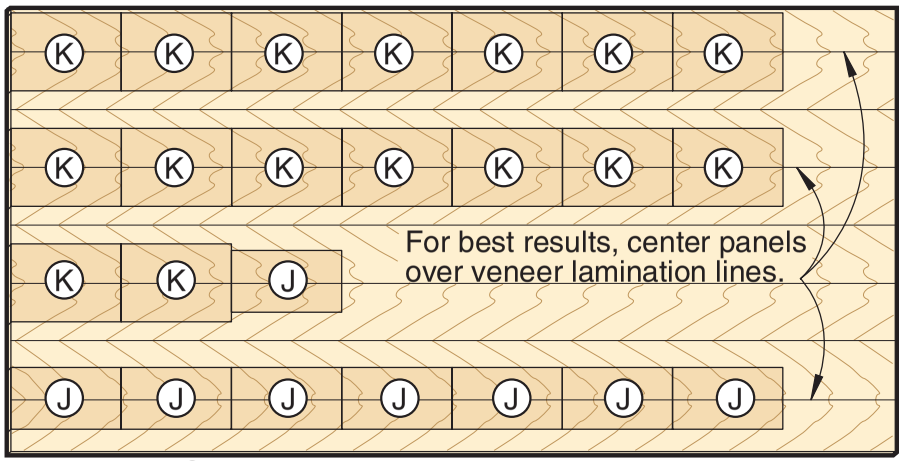
1 1/16 x 9¼ x 96" Walnut (5/4 stock planed to 1" thick.)



¾ x 5½ x 96" Walnut



¾ x 5½ x 96" Walnut (2 needed)



¼ x 48 x 96" Cherry plywood

Start with the carcase parts and top cleats

***Note**: For the best fitting joints, surface-plane at the same time all materials that require the same finished thickness.*

1 From 8/4 walnut, cut the legs (A) to the size listed in the Materials List and set aside. You also can make the legs by laminating three ¾"-thick boards and surface-planing to the listed dimensions.

2 From 5/4 walnut, planed to 1" thick, cut the side top rails (B), side bottom rails (C), stiles (D), front/back top rails (E), front/back bottom rails (F), front/back cleats (G), side cleats (H), and top cleats (I) to the sizes listed.

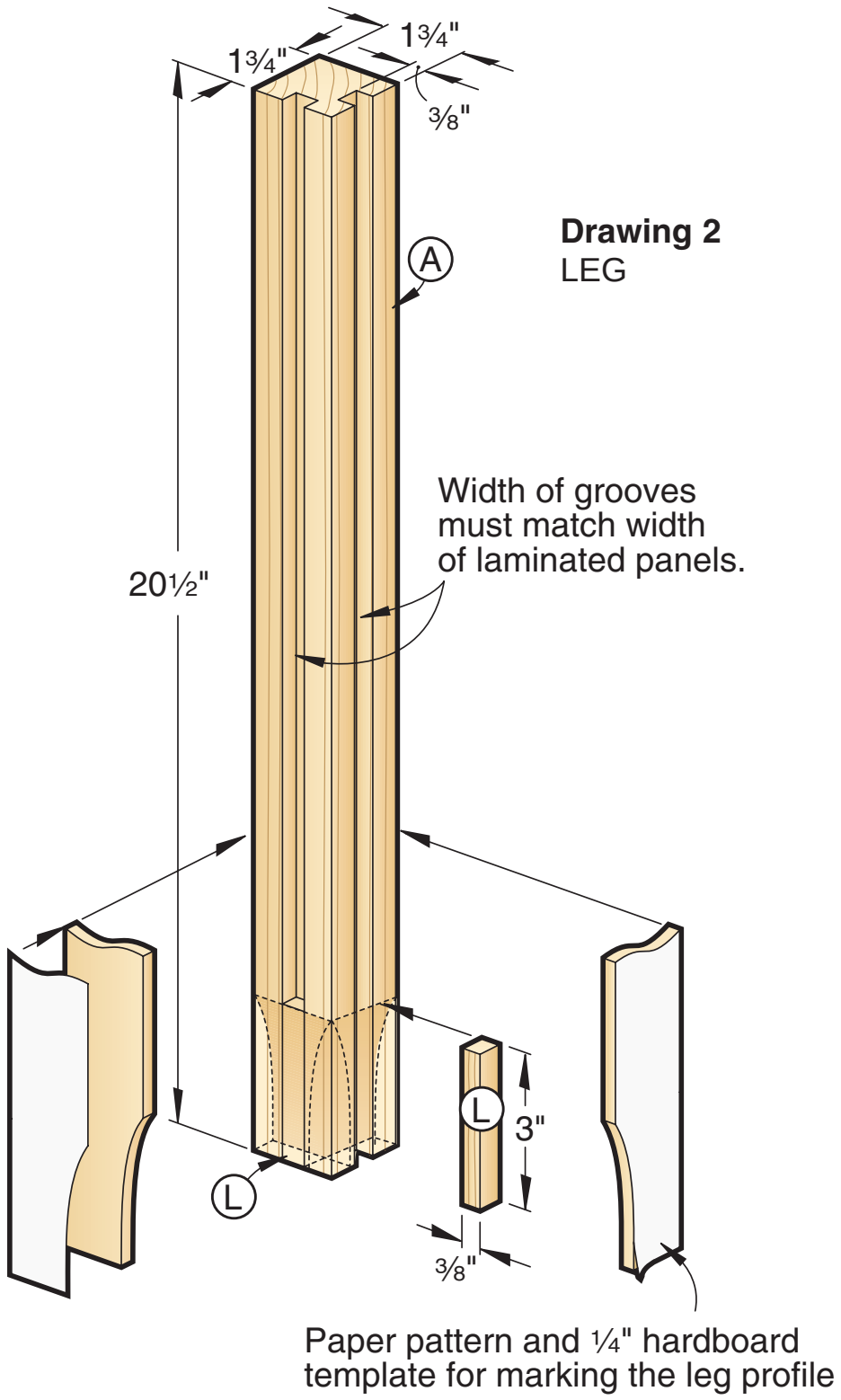
3 Cut a ⅜" notch in both ends of the side cleats (H), where shown on **Drawing 1a.**

4 Lay out and cut a ¾" radius on the ends of the top cleats (I), where shown on **Drawing 1.** Then rout a ⅛" round-over on the outer edges of the cleats.

5 To form the ½"-thick side panels (J) and front/back panels (K), first cut ¼"-thick cherry plywood to the sizes listed. (You'll need to double the quantity in the Materials List.) For the best appearance, cut the panels so that the veneer lamination line will be in the center of each panel, where shown on **Drawing 1.** Determine which panels—when placed side by side—offer the best overall look, and which can be joined back to back. You'll want the best face of each panel facing the outside of the chest. Then, glue and clamp the panel sets back to back.

Machine the details on the carcase parts

1 To cut the grooves in the legs (A) to receive the side panels (J), front/back panels (K), and the tenons of the rails, install a ⅜" dado blade in your tablesaw. Adjust it to cut 1/32" deeper than the ⅜" depth shown on **Drawing 2** to allow for glue squeeze-out and to ensure that the rail tenons do not

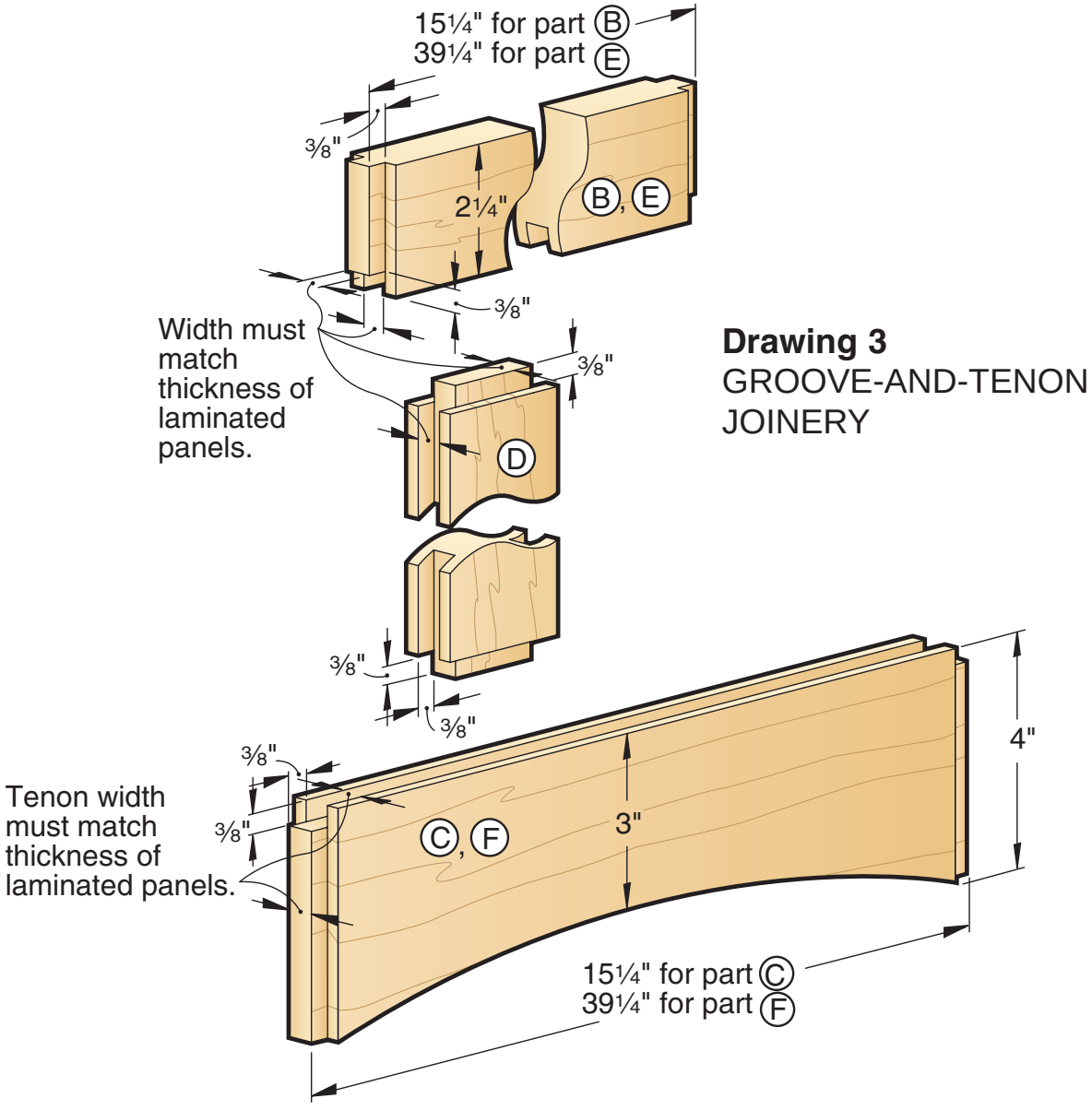


Drawing 2
LEG

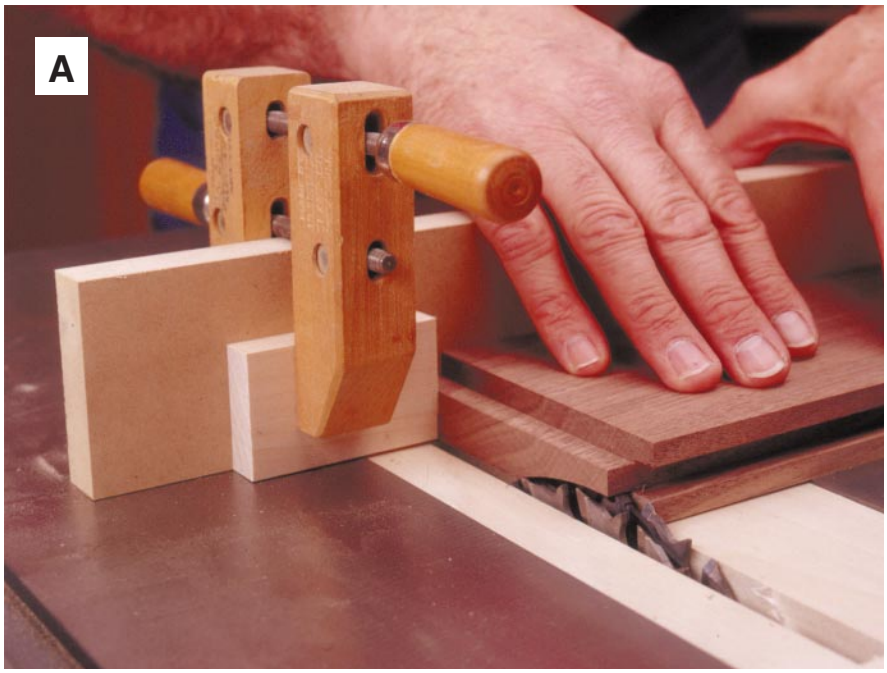
bottom out in the grooves. Using a scrap the same thickness as the legs for a test cut, position your tablesaw fence so that the dado blade will cut a groove that is just shy of being centered in the scrap. Make the cut, turn the piece around, and make another cut to widen the groove. Test-fit a panel in the groove. Adjust the fence and repeat the test cut, as necessary, until the panel fits in the groove. Then, cut the two grooves in each leg**.**

2 To cut the grooves in the side top rails (B), side bottom rails (C), stiles (D), front/back top rails (E), and front/back bottom rails (F), where shown on **Drawing 3,** to receive the panels and stile tenons, follow the same process that you used for adjusting the fence position for the legs (A) except use a scrap that is the same thickness as the rails for your test piece. Then, cut the grooves in the rails, where shown.

3 Now, to form the ⅜"-long tenons on the ends of the rails (B, C, E, F) and stiles (D), where shown on **Drawing 3,** begin by attaching an auxiliary fence to your tablesaw miter gauge to avoid chip-out, and also attach a stopblock to the fence. Adjust the height of your ⅜" dado blade to ¼" and set the stopblock ⅜" from the side of the blade, as shown in **Photo A.** Using a scrap that is the same thickness as the rails and stiles, cut one end of the piece, turn it over, and cut it again to form a tenon. Test-fit the tenon in the leg groove. Adjust the blade height and test-cut, as necessary, until you get the proper fit of the tenon. Then, cut the tenons on the ends of all of the rails.



Drawing 3
GROOVE-AND-TENON JOINERY



Cut the tenons on the rails and stiles using a stopblock, as shown, to ensure a consistent tenon length.

4 Lay out the arch in the side bottom rails (C) and front/back bottom rails (F), where shown on **Drawings 4** and **5.** Refer to the **Shop Tip**, An easy way to lay out smooth arches, on *page 8*. Now, bandsaw the arches and sand to remove saw marks.

Complete the legs

1 Cut the filler strips (L), which fill the bottom of the grooves in the legs (A). Cut the strips slightly proud of ⅜" thick.

2 Glue and clamp the filler strips (L) in the legs (A), where shown on **Drawing 2.** When the glue is dry, sand the strips flush with the legs.

3 To cut the curves in the bottom of the legs (A), first make a photocopy of the leg full-size pattern on *page 12*. Then, using spray adhesive, adhere the pattern to a piece of ¼" hardboard to make a template. Cut and sand the hardboard to the pattern line.

4 Using the template, lay out the curves on each leg (the curves are on the two sides with the grooves). Bandsaw and sand the curves to the layout lines.

5 Chuck a ⅛" round-over bit in your router, and rout the three outer edges and all bottom edges of the legs (A), where shown on **Drawing 4.**

Let the assembly begin

1 To form each side of the chest, first dry-assemble the legs (A), side top rails (B), side bottom rails (C), stiles (D), and side panels (J). See **Drawing 4.** Check for correct fit and for square. Then, glue up and clamp each side-panel assembly.

2 To form the front and back panel assemblies, dry-assemble the stiles (D), the front/back top rails (E), the front/back bottom rails (F), and front/back panels (K). See **Drawing 5.** To keep the stiles evenly spaced, use masking tape to mark their locations on the face of the rails. Check for square; then, glue up and clamp.

3 Unclamp and sand all the panel assemblies. Then, place each assembly outside face down and, referencing **Drawings 1** and **6**, measure 1¾" down from the top edge of the side bottom rails (C) and front/back bottom rails (F) for the location of the top edge of the side cleats (H) and front/back cleats (G). Because the front/back cleats (G) fit between the side cleats (H) when the panel assemblies are joined together, you must center the front/back cleats (G) on the rails, where shown in the drawings.

4 With the cleats correctly positioned on the rails, drill pilot and countersunk shank holes through the cleats into the rails, where shown on **Drawings 1** and **6.** Then, attach the cleats to the rails with glue and #8×1½" flathead wood screws.

5 On a flat surface, glue and clamp the end-panel assemblies to the front- and back-panel assemblies to form the chest. Check for square.

6 From ¾" cherry plywood, cut the bottom (M) to the size listed. Then form the ⅜" notch in the corners, where shown on **Drawing 1b.**

7 Place the bottom (M) on the cleats and drill pilot and countersunk shank holes through the cleats into the bottom, where shown on **Drawings 1** and **6**. Attach the bottom to the cleats with #8×1½" flathead wood screws.

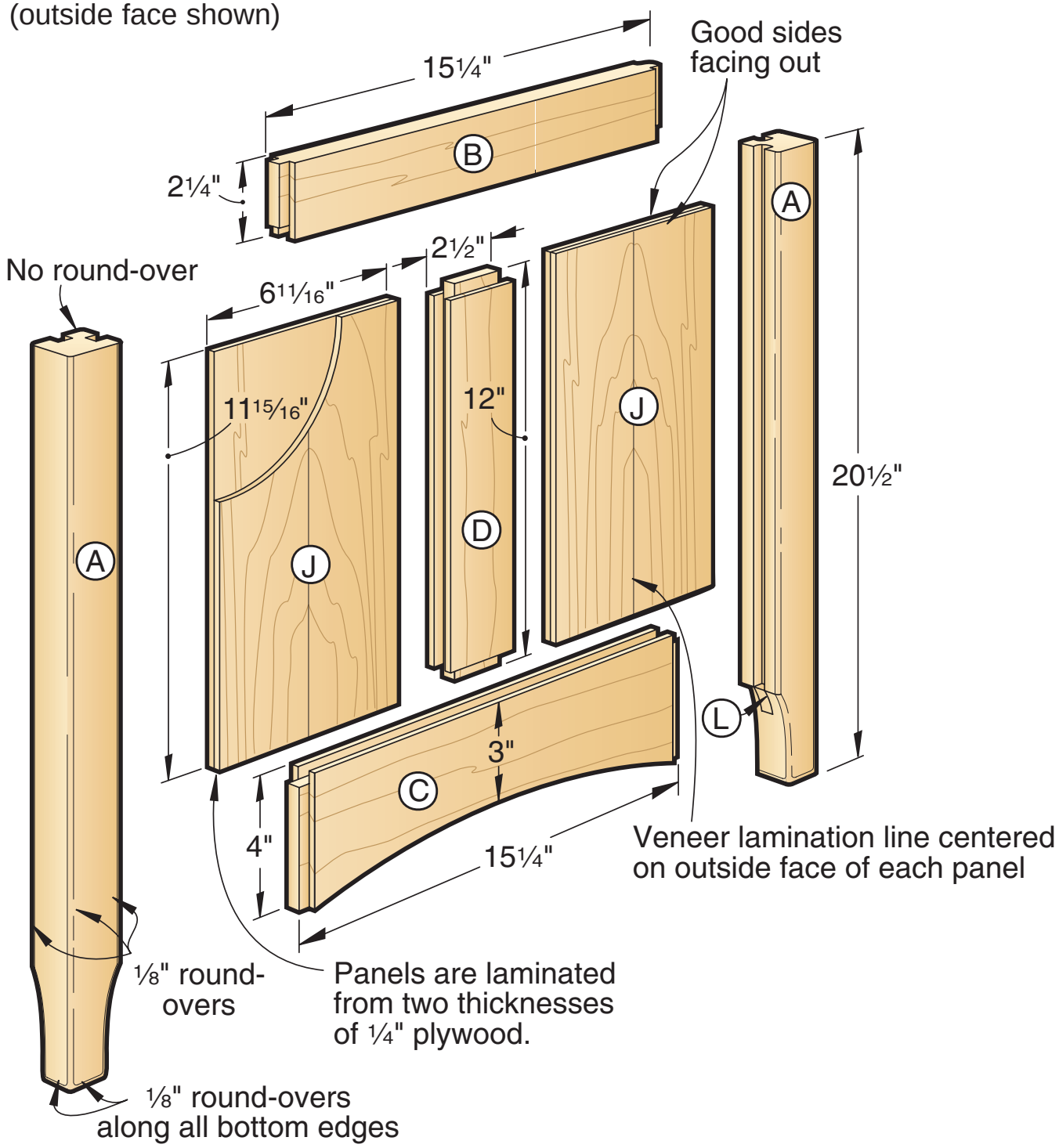
Now add the trim

1 From ¾"-thick walnut, cut the front/back top trim (N) and side top trim (O) to the sizes listed except make the lengths 1" longer to allow for the ends to be miter-cut later.

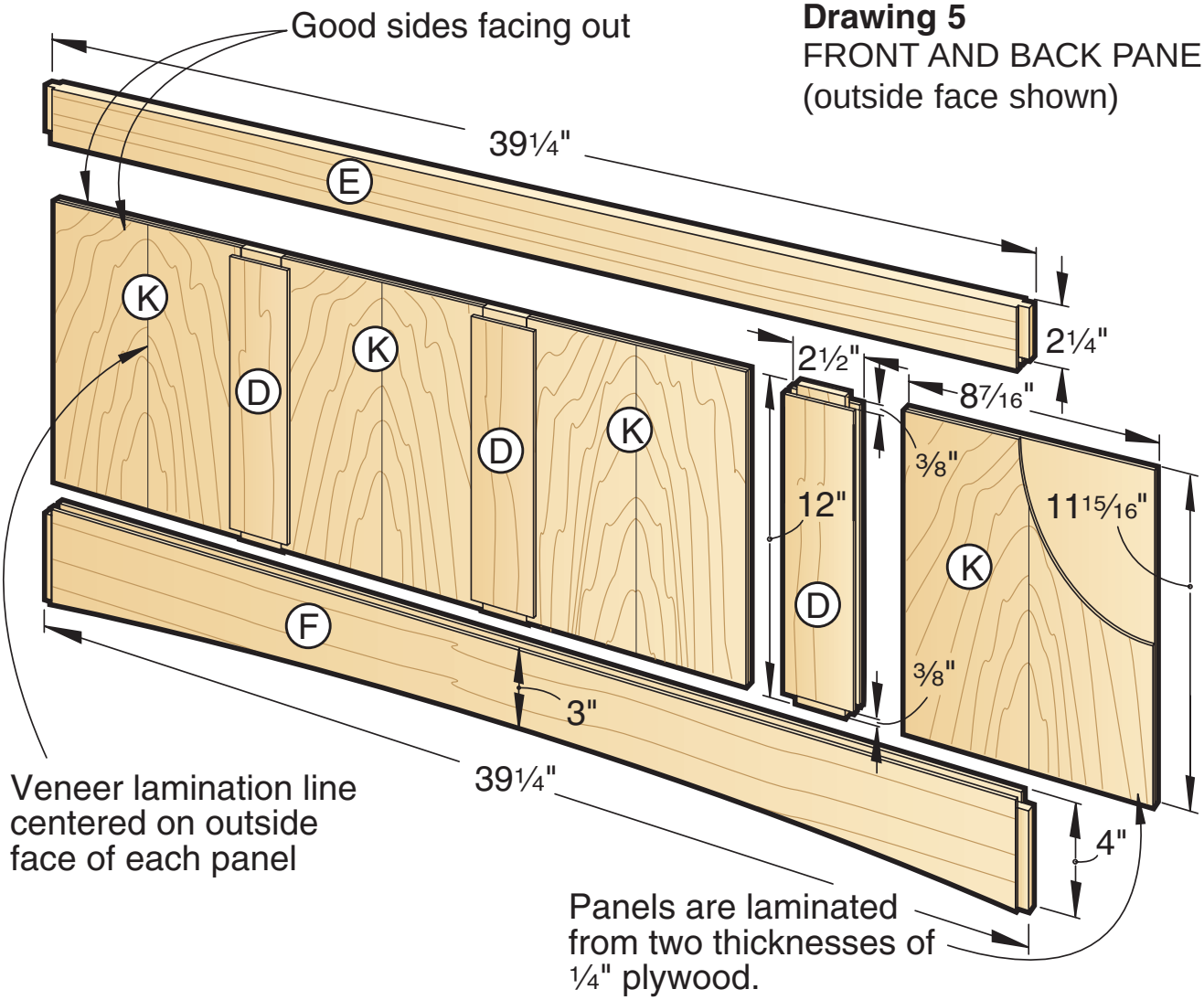
2 Chuck a ¼" cove bit in your table-mounted router and rout a ¼" cove along the outer bottom edge of all of the trim pieces, where shown on **Drawings 1** and **6a**. Switch to a ⅛" round-over bit and rout the top outer edge of all of the pieces.

3 Miter-cut all of the trim pieces to the finished length. Then, position the front/back top trim (N) and side top trim (O) on the chest, where shown on **Drawing 1**, so that the outer edge of the trim overhangs the legs (A) by ⅜", where shown on **Drawing 6a.** Glue and clamp the trim in place.

Drawing 4
SIDE PANEL
(outside face shown)



Drawing 5
FRONT AND BACK PANEL
(outside face shown)



SHOP TIP

An easy way to lay out smooth arches

Mark arches of nearly any length or curvature using this simple method. Clamp three stop-blocks to the workpiece, two at the ends of the arch and one at its middle (this block should come to a point) as shown. Rip a ⅛"-thick fairing strip of wood, position it between the blocks, and mark the arch.

4 Drill pilot and countersunk shank holes through the front/back and side trim into the rails, where shown on **Drawing 1**, and drive the #8×1½" brass flathead wood screws.

Time to top it off

1 Cut enough ¾"-thick random-width walnut boards for the top (P). Cut the boards so that when placed edge to edge they exceed the top's finished width and length by 1".

2 Joint the edges of the boards; then glue and clamp them to form the top, keeping it as flat as possible. Remove any squeeze-out. When the glue is dry, cut the top (P) to the size listed.

3 Set up your router with a ½" round-over bit, and rout the perimeter of the top (P) on its *bottom* side, where shown on **Drawings 1** and **6a.** Switch to an ⅛" round-over bit, and rout the perimeter of the *top* on its face side, where shown. Sand smooth.

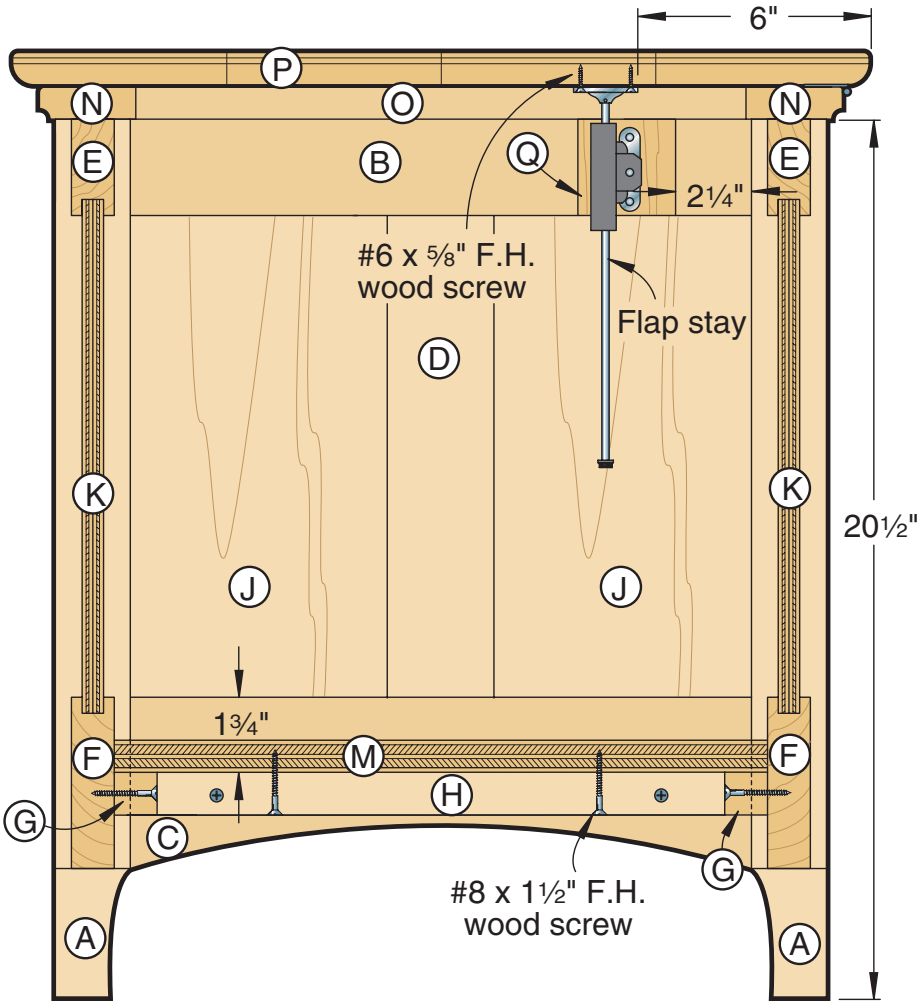
4 Position the cleats (I) on the bottom face of the top (P), where shown on **Drawing 1**, and drill pilot and countersunk shank holes through the cleats into the top for #8×1½" flathead wood screws. Remove the cleats.

5 To allow for expansion and contraction of the top, drill a ⅜" counterbore ⅝" deep in the bottom of the cleats in the two outer screw holes (see the **Shop Tip,** *page 10*). Now, screw (no glue) the cleats to the top.

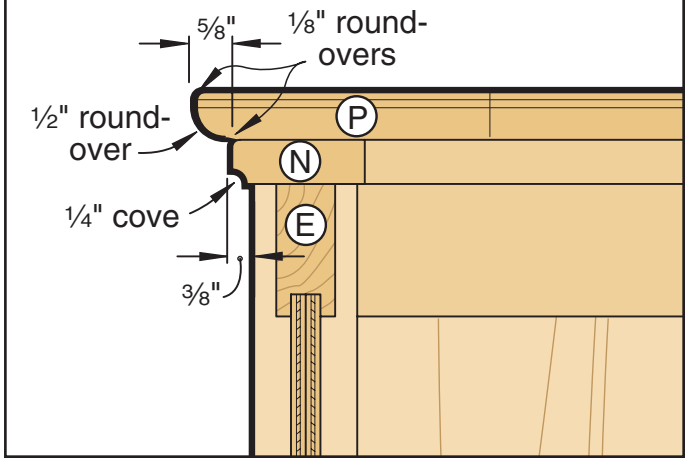
Attach the lid to the chest

1 To locate the positions for the no-mortise hinges, first make the hinge locating jig, shown on **Drawing 7.** With the top (P) face down, position the jig on the back edge of the top (as viewed from the back) flush with its right end. Place a hinge in the opening in the center of the jig with the barrel up (to keep the hinge flat for marking) and against the jig. Mark the loca-

Drawing 6
SIDE SECTION VIEW



Drawing 6a LID SECTION VIEW



To locate the hinge positions on the back top trim (N), set the chest on 1½"-high support blocks (we used 2x4s). Position the top (P) as shown.

tions for the hinge screws in the small leaf part of the hinge. Now, move the jig and hinge to the left end of the top, flush with the edge of the top, and again mark the screw hole locations in the hinge. Drill pilot holes in the marked locations, and attach the hinges to the top with #5×⅝" flathead wood screws.

2 To locate the hinge positions on the back top trim (N) of the chest, see **Photo B** for set-up. With the top (P) positioned as shown and the top centered end-to-end with the chest, mark the screw locations on the trim. Attach the hinges to the trim with #5×⅝" flathead wood screws in pilot holes.

3 To install the flap stay, cut the filler block (Q) (or two blocks if you want to install a second flap stay) from ½"- thick walnut to the size listed. (We installed one flap stay and found this to be adequate. However, if you prefer additional resistance to lid closure for safety reasons, install the additional flap stay.) Glue and clamp the block to the side top rail (B), where shown on **Drawing 6.** When the glue is dry, secure the block by driving a screw in the center into a pilot hole. Attach the flap stay to the block and to the top (P), where shown, by driving screws into pilot holes.

Sand and finish it up

1 Remove the flap stay and hinges. Finish-sand the entire chest with 220-grit sandpaper.

2 Apply a clear finish of your choice, sanding between coats and removing dust with a tack cloth. We suggest using a penetrating oil, such as Watco Danish Oil, for the chest portion to highlight the grain and enhance the colors of the woods. For the top, we recommend a Zar polyurethane finish to provide more durable protection for this piece. Because multiple coats of satin polyurethane have a potential to cloud the finish, we recommend that you first apply two coats of high-gloss polyurethane followed by a final coat of satin polyurethane. Sand and remove dust between all coats.

3 Install the hardware and start filling the chest.

Produced by Marlen Kemmet
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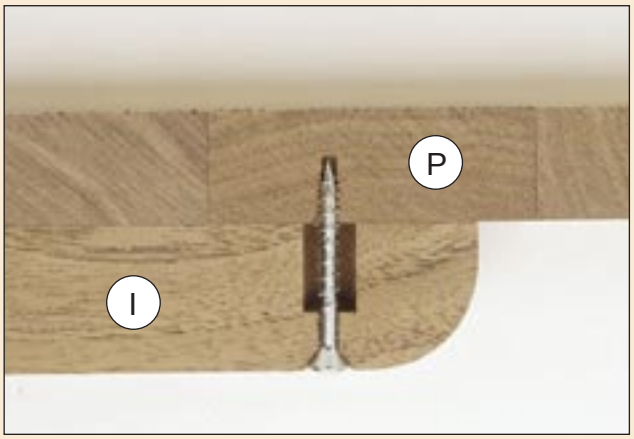
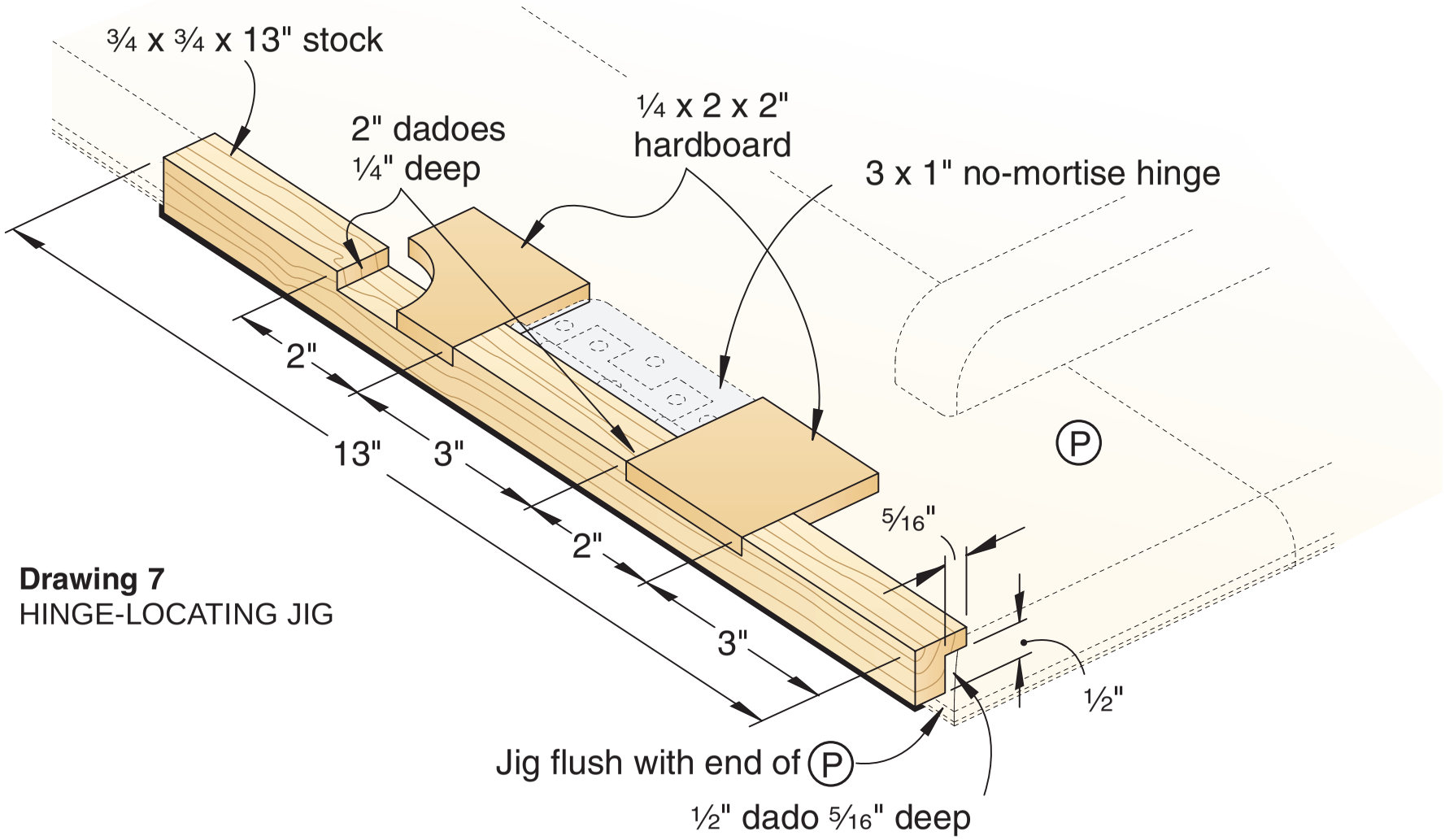
Project design: Kent Walsh
Graphic Design: Jamie Downing
Illustrations: Roxanne LeMoine; Lorna Johnson
Photographs: Baldwin Photography; Douglas E. Smith

SHOP TIP

Low-tech trick gives solid-wood panels room to move

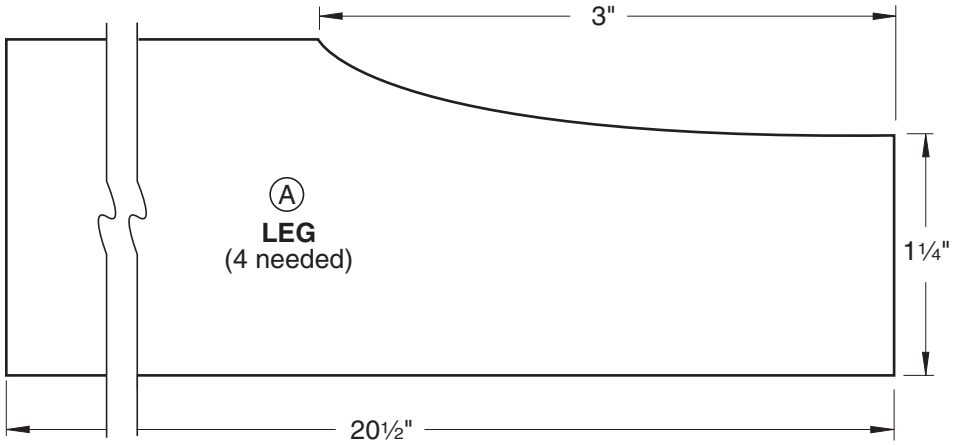
There's no getting around it: wood contracts and expands with changes in seasonal humidity. If you don't allow for that movement, wide panels of solid wood will bow, cup, or split. So, when you screw cleats to solid panels, counterbore the screw holes in the cleat as shown. That allows the screw to move back and forth as the panel moves. Never glue cleats to wide, solid-wood panels.



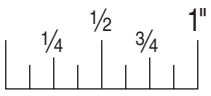


Drawing 7
HINGE-LOCATING JIG

FULL-SIZE PATTERN



To ensure full-sized patterns are correct size, your printer should be set to print at 100% (not fit to page). Measure full-sized patterns to verify size.



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