

Templates, routers,
and a foolproof finish
make this traditional
project approachable
and elegant

BY BRENT BENNER

There's nothing like built-in furniture to turn an awkward space into a cozy nook. To many people, the art of the built-in reached its height during the Art and Crafts movement. My clients hold that opinion so dear to their hearts that they've turned their house into a showcase of period design. Recently, they asked me to build an Arts and Crafts style bench to serve as an inglenook for their living-room fireplace.

The bench began with a design borrowed from a similar piece in my clients' furniture collection. Made of quarter-sawn white oak, my take on the design has simple L-shaped sides with a decorative slot, a frame-and-panel backrest, and storage under a hinged seat. Like all good inglenooks, it's shoehorned into a space between the fireplace and a corner.

Get started with accurate measurements

To determine the dimensions of the bench, I used a set of homemade measuring sticks to size the space where the bench would be installed. Nothing more than two long pieces of 1x scrap wood held side by side, the sticks were telescoped out to the left and right to span the exact width of the space allotted for the bench. A pencil line drawn

Arts and Crafts Style Built-in Bench

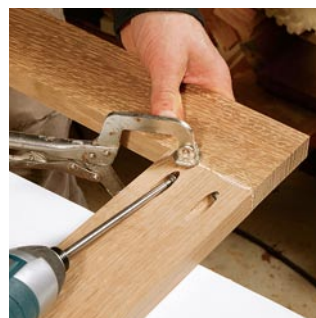
ASSEMBLY WITH FLEXIBILITY IN MIND

This bench is essentially a box within a box. The inner box is stable plywood, and the outer is white oak, which like most solid wood tends to move seasonally. The various parts of the bench have to be assembled with elongated screw holes so that the wood won't crack when it swells or shrinks. Because it's a built-in, the bench also must have extra material in key areas so that it can be scribed to the floor and walls.

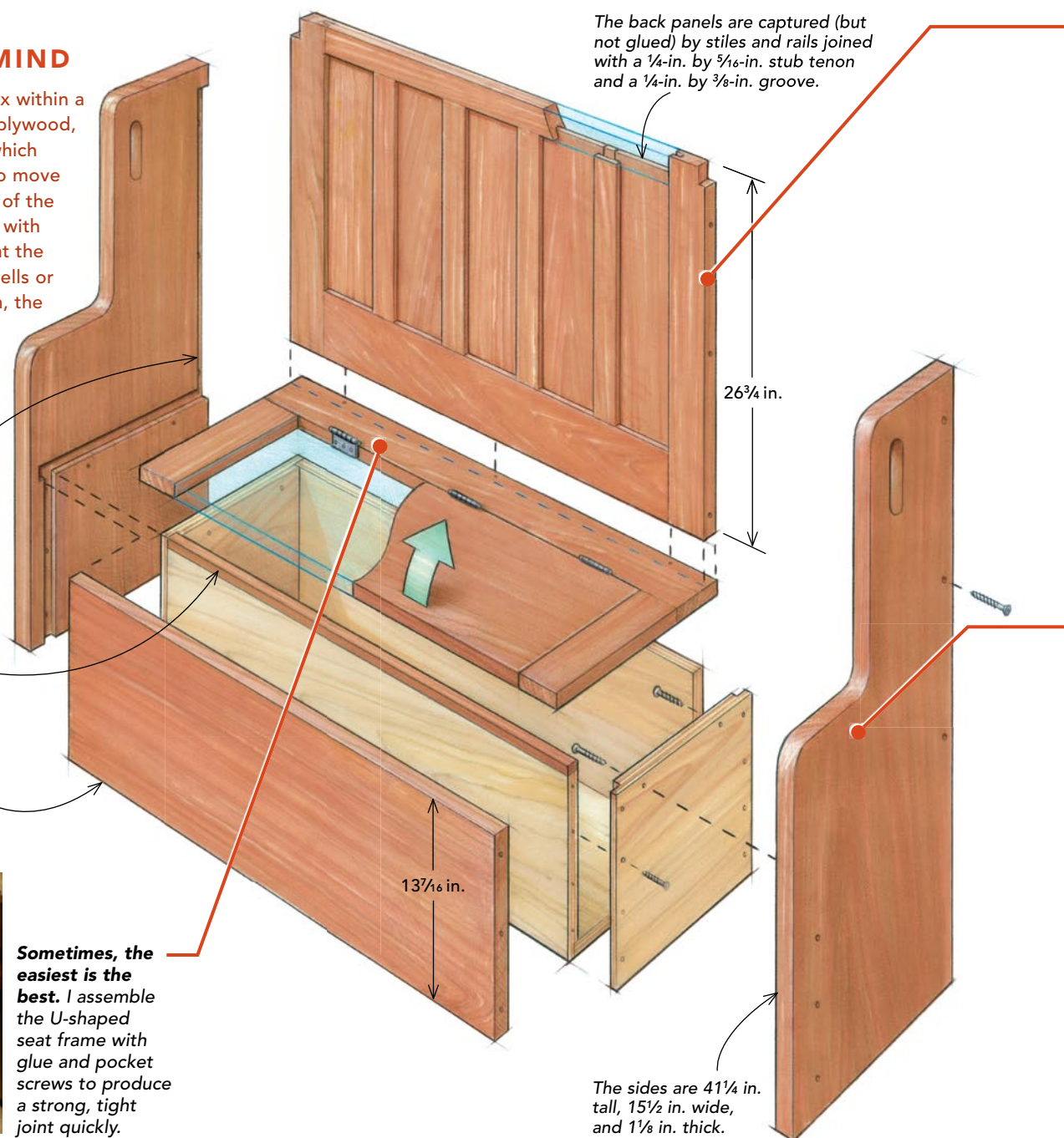
The dados that accept the back are stopped about 1½ in. below the top edge so that they won't show; the back stiles are notched accordingly.

A ¾-in. by ¾-in. piece of oak conceals the top front edge of the plywood box when the seat is open.

Surplus material along the bottom edge of the front allows the installer to scribe the stock to the floor.



Sometimes, the easiest is the best. I assemble the U-shaped seat frame with glue and pocket screws to produce a strong, tight joint quickly.



The back panels are captured (but not glued) by stiles and rails joined with a ¼-in. by ⅝-in. stub tenon and a ¼-in. by ⅜-in. groove.

26¾ in.

13⅞ in.

The sides are 41¼ in. tall, 15½ in. wide, and 1 in. thick.

across both sticks marked the measurements that I later transferred to the bench design.

Once I had accurate site measurements, I made a shop drawing of the piece, and used the dimensions to mill and glue up stock for the sides, seat, and panels. I used 6/4 stock for the sides and 4/4 stock for the back; the final thicknesses came to 1½ in. and 1⅜ in. respectively. (If you don't have the tools to mill rough-sawn lumber, most local hardwood suppliers can plane and joint stock for a small fee.)

After all the parts were milled, I began building the bench, starting with the back. Made like a cabinet door, the back is a frame-and-panel assembly; the rails and stiles are milled with a square-edged stub-tenon-and-groove joint. The panels aren't glued to the frame, so they can move seasonally. I made the panels ¾ in. thick so that they'd never crack or rattle in the frame, and I used a raised-panel

bit to relieve the panels' edge to fit into the frame's groove. Although the raised profile is hidden on the back of the bench, the detail is historically accurate. When I had the back glued up, I built the box for the bench's storage space from ¾-in.-thick maple plywood.

Use templates for consistency

Next, I created a template that was the exact replica of the side pieces. I used ¼-in. MDF for the templates because it's inexpensive and uniform. Once the template was drawn and cut, I traced its outline onto the side stock, rough-cut the pieces on a bandsaw, then cleaned up the line using the template to guide a router and a flush-trim bit, which I've found makes a cleaner cut than a straight bit and bushing.

After cutting the decorative slots in the sides (also using a template), I routed dados to accept the seat apron and the seat. I used the origi-

BUILD THE BACK PANEL LIKE A DOOR



I used a router table to shape the rails, stiles, and back panels. After cutting the stock to length, I routed the grooves with a 1/4-in. slot cutter. Next, I cut the stub tenons with a double slot cutter and secured the stock on a shop-built crosscut sled. Hold-downs immobilize the stock, and a T-slot insert from a bevel guide keeps the jig parallel to the bit. Finally, I used a vertical raised-panel bit to relieve the 3/4-in.-thick panels' back side.



CUT SIDE PIECES WITH A TEMPLATE



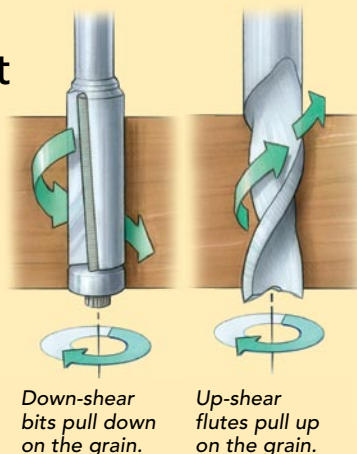
The most accurate method of cutting identical pieces is to use a template. Here, I cut the design from a piece of 1/4-in. medium-density fiberboard (MDF), traced its shape onto the side stock, then rough-cut the shape on a bandsaw. I used double-sided tape to adhere the template temporarily to the bottom of the stock and a 1 1/2-in.-long down-shear flush-trim bit to trim to the line.



Two ways to reduce tearout

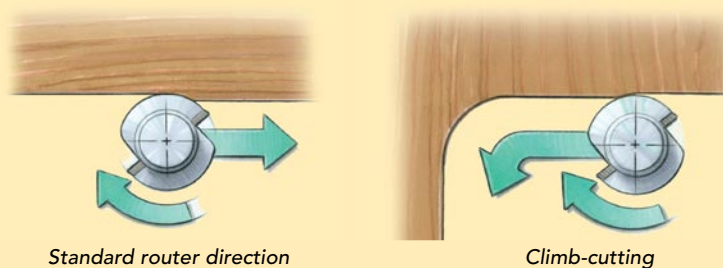
Use up- and down-shear bits

Unlike straight router bits, whose flutes are parallel to the bit's shank, up-shear and down-shear bits have flutes that wrap helically around the bit. Down shear prevents tearout on the top surface; up shear prevents tearout at the bottom.



Change the direction of cut

When routing, the accepted practice is to push the router against the direction of the bit's spin. When handheld, the router should travel from left to right; on a router table, the work is pushed from right to left. However, for handheld routing shapes that involve changes in grain direction or end-grain cuts, it's better to push the router in the opposite direction, a technique known as climb-cutting. For safety's sake, light passes and a firm grip on the router are recommended.



CLEAN DETAILS



1

2

1/2-IN. TOP-BEARING PATTERN BIT
Rockler
www.rockler.com
\$20

UP/DOWN SPIRAL BIT
Jesada
www.jesada.com
\$80

To cut the decorative slot on the sides, I traced the outline of the slot, then drilled a 7/8-in. access hole with a Forstner bit, clamped the template to the back side of the stock (1), and began the cut with a top-bearing pattern bit. I made successively deeper cuts (2) until there was width enough to support a router bit's bearing from the opposite side. I removed the template, flipped over the stock, and used the down-shear flush-cutting bit (sidebar p. 61) to finish. Because the cuts meet in the middle of the stock, the slot has sharp edges on both sides and a clean interior.

I used a second template to cut dados in the bench sides for the seat frame and the front panel. (3) This time, I used a bushing in the router base to guide an up/down spiral bit (photo center left) that cuts a flat-bottom dado and still doesn't produce any tearout on the surface.

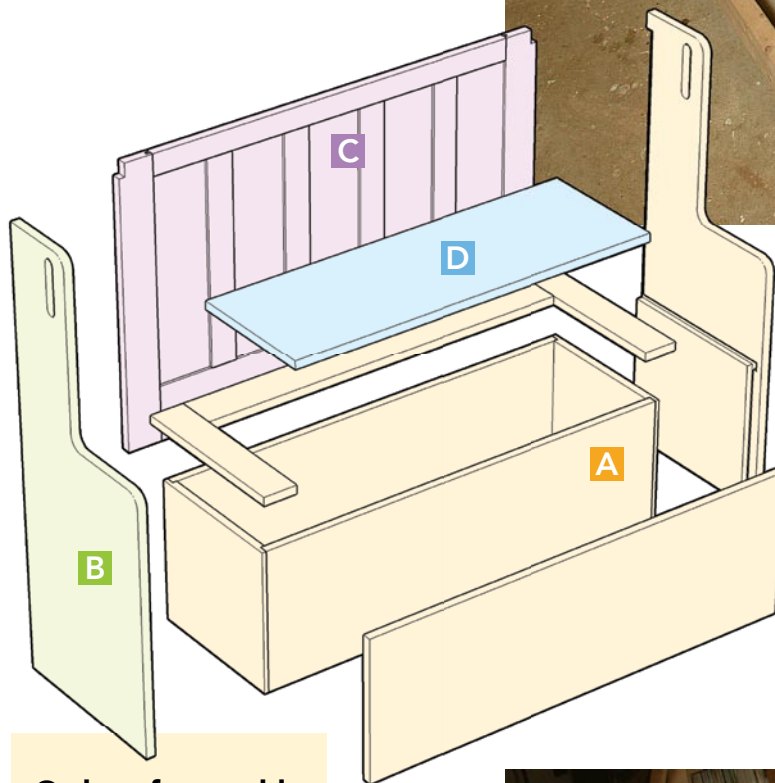


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ASSEMBLY: TRY IT DRY, THEN GLUE AND SCREW

I test-fitted all the parts to make sure the joinery was right, then began the assembly by locating and drilling pilot holes.

(1) By angling the drill back and forth, I enlarged the holes so that the screws could move with the wood as it expands and contracts seasonally. (2) I checked the fit of the dados and made adjustments as needed. (3) The back panels were notched to fit the stepped dados. After the test fit, I repeated the sequence with glue and screws.



Order of assembly

A The box is screwed to one bench side; then the seat frame and the box-front panel are fitted into the dado on the same side.

B Next, the opposite bench side is attached to the box, the front panel, and the seat frame.

C The back panel is fitted to the sides and fastened from the sides and up through the seat frame.

D The seat hinges and the seat are installed.





nal template to check the layout but made a new template to cut the dadoes. This time, I used a bushing attached to the router base that rides on the template; an up/down spiral bit removed the stock. This bit's down-shear cut limited tearout at the top of the cut, and the up-shear action on the tip cut a clean, flat bottom. I used the same setup to cut the rabbet for the back panel.

The last assembly I made was the seat and its frame, which was butt-jointed and pocket-screwed together. After trimming the seat to fit in the frame, I mortised and attached three 2½-in. brass hinges.

Because most of the fasteners are concealed, I used screws to assemble the bench. Before assembly, I used a ¼-in. drill bit to elongate the screw holes; the slightly larger elliptical hole allows the screw head to move as the wood moves and reduces the chance that the wood will crack. Finally, I dry-assembled the plywood box, the box front, the seat frame, the back, and the sides to check the fit, then repeated the assembly with glue and screws.

A combination of stains makes a realistic finish

The historically correct way to finish an Arts and Crafts piece involves ammonia fumes. Lucky for me, the homeowners had come up with an alternative they liked for other parts of the house, so I tried it on the bench. The first layer of stain was a stock Sherwin-Williams variety (Cinnamon mixed in a Fruitwood base; www.sherwin-williams.com) that darkened the grain and added depth. After a few minutes, I wiped off the excess stain, lightly sanded the bench with a 220-grit foam sanding pad, cleaned it with a tack cloth, and repeated the process with a second coat of stain. This time, it was Benjamin Moore's Red Oak stain (www.benjaminmoore.com). I finished the bench with three coats of Benjamin Moore flat polyurethane, sanding lightly between coats.

To install the bench, I eased it into the space, leveled it, and scribed it to the floor. On the wall side of the bench, I had to back-bevel the side with a belt sander until it fit the wall tightly. On the fireplace side, a piece of ½-in. plywood covered the wall, so I shimmed it to meet the bench. The plywood edge later would be covered by the fireplace surround. I finished by securing the bench with screws through the plywood box and into the wall studs behind it. □



Flood and wipe for a subtle effect. Applying the first coat of stain with a brush saturates the wood with color. After letting it sit for a minute, I wipe off the excess with an absorbent cloth. This first color provides a base tone that gives depth and character to the final color.

Brent Benner is a cabinetmaker who lives and works in Roxbury, Conn. Photos by Charles Bickford, except where noted.