These two oiled walnut chests are identical, except the one on the left has a straight front with convex drawer fronts and the one on the right has a concave front with concave drawer fronts. From a distance, these differences are subtle, but as you look closer, the details are distinct.

Variations on a Four-Drawer Chest

Divergent details make all the difference

by Tage Frid

Too often, furniture is overly decorated with contrasting colors or shapes that fight each other and shout at you from across the room. I prefer furniture that is more subtle and beckons to you with clean, quiet lines and well-thought-out details. Don't underestimate the power of details. To demonstrate how these little touches can change and enhance a piece, I made two identical chests of drawers, but gave each a distinct personality by experimenting with different drawer fronts. Both carcases have concave sides; a sweeping, curved bevel on the fronts of their flat tops and bottoms; dovetailed drawers; and curved pediments. But one chest has a concave front and concave drawer fronts, and the other is straight with convex drawer fronts. From across the room, their differences look slight; up dose, the chests appear to be two different designs.

After building the two carcases, using simple tablesaw and router setups, I mocked up ¾x3x12 miniature fronts first to see what kind of effects I could get and then weeded out the designs I didn't like. For instance, to simulate a veneered convex front, I colored the surface with white chalk. From this I could see that any color would make the chest look like a parakeet, and I wouldn't want a creature like that squawking at me when I wake up in the morning. If a mock-up looked good, I made it full size so I could visualize it on a completed carcase. Eventually, I decided on the shaped fronts shown on the chests above. Here I'll concentrate on making the chest with convex drawer fronts, but I'll also give you enough information to make the chest with a concave front, if you prefer that design.

Making the carcase-Gather stock with similar figure and color, and cut all the parts following the dimensions in the bill of materials on p. 85. Joint the edges of the 1½-in.-thick pieces for the carcase sides, top and bottom, and after matching them for figure, glue and clamp them. Since my planer is too narrow for 17-in.-wide panels, I carefully aligned the long butt joints during glue-up so that I only had to lightly belt-sand the surfaces when the glue dried.

Next, rip the carcase sides, top and bottom to width and miter them to length according to the dimensions in the bill of materials. Because of the width of the workpieces, the best way to cut the miter is to set the blade at precisely 45° and guide the work on a sliding table or crosscutting jig. To test the angle, cut across a piece of scrap, put the cut ends together at a right angle and check the assembly with a square. Adjust the blade until the fit is accurate.

Routing the spline mortises—After the sides are mitered, the next step is to cut the spline mortises, as shown in the drawing on p. 84. Square thickness-planed splines, acting like loose tenons, are inserted in mortises that are hidden in the miter. The mortises are easily made with a router and template. I used multiple splined joints rather than similar full-blind dovetails because the splines have more glue surface and are stronger.

I set up my router with a ⅜-in.-dia. straight bit and a ¾-in.-dia. template collar and guided it in slots in one end of a ½x17x24 plywood template. The slots in the template are as wide as the collar and twice as long as the mortise (2 in.), so the collar will be

secure in each slot before the bit begins cutting. I cut the slots on the tablesaw with a dado blade, standing the template on end and guiding it across the blade with the miter gauge. Make a test cut in a piece of scrap and adjust the dado blade until the router's template collar fits snugly in the kerf. Although the slots don't have to be spaced precisely, they should be about 2¼ in. apart and the outer slots should be about ⅝ in. from the edges. You must be careful to cut each piece the same way so the adjoining carcase pieces fit together properly. Mark the front of the template to correspond to the front of each workpiece. Then, with the workpiece flat on the bench and its inner face up, align the template to cut the mortises 1/16 in. from the inside corner of the miter so the mortises are fully hidden inside the joint. On my router-jig setup, the bit is 3/16 in. from the edge of the slot when the collar is against it. Therefore, I marked a line on the inner face of each workpiece ⅛ in. from the miter corner and aligned the back of the slots on this line.

Clamp the template to the workpiece and cut the mortises on one end, as shown in the top photo below. When you've finished, flip the template end for end, realign and clamp it in place, and rout the other end. Do this for each carcase piece. I chisel the mortises square (and use square-edge splines) to increase the gluing area.

While the carcase sides are still flat, rout the ¼-in.-wide by 9/32-in.-deep dadoes in their inner face for the drawer runner tongues and the stretcher tenons. Guide the router base against a straightedge clamped to the workpiece. Each drawer front is 5¼ in. wide, so there is 5¾ in. between each dado, with the top and bottom dadoes 5½ in. from the miters' inside corners. In order to make the stretcher tenons invisible, stop the dadoes ¼ in. from each side's front edge and chisel their ends square. Be sure to cut the ¼-in.-wide shoulder on the outer edge of the stretcher's ¼x¼x2¼ tenons. Lastly, before shaping the carcase's outside surfaces, rip a ¼-in.-deep by ½-in.-wide rabbet in the back edge of the sides, top and bottom for the plywood back. Now you can begin working on the carcase top and sides.

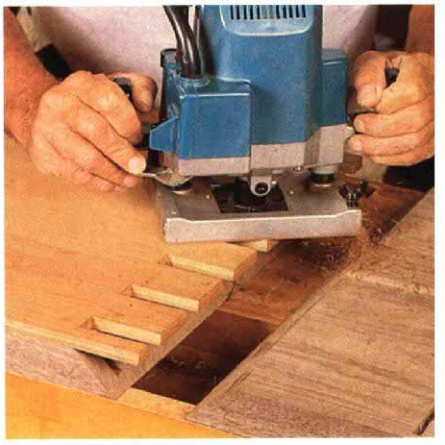
Shaping the carcase top and sides—The front of the convex carcase is straight, even though its drawer front surfaces are shaped. The front edges of the carcase top and bottom have a curved bevel, as shown in the drawing. Mark the bevel's outline with thin plywood patterns. As you can see in the drawing, the curve is ⅝ in. deep over 40 in. on their front edges and 2 in. deep over 40 in. on the surfaces of the top and bottom. Spokeshave to the lines, and flatten the beveled surface with a cabinet scraper. Then finish with a sharp scraper blade before sanding. Use your fingers to feel when the surface is smooth, the curves are fair and the corners are crisp.

The drawer fronts of the concave carcase are curved ⅝ in. deep over 40 in., and so are the front edges of the carcase (see the drawing). Otherwise, the two carcases are identical. Bandsaw the curve in the front edge of the stretchers and the carcase top and bottom, and shape each piece identically with a router and template. Then lay out the bevels on the top and bottom with thin patterns (a curve ⅝ in. deep over 40 in. on the front edges and a curve 2⅝ in. deep over 40 in. on the surfaces of the top and bottom).

I scooped out the concave sides of the chests with my plunge router and the jig shown in the bottom photo at right, guiding the router in an arc over the workpiece surface. The workpiece is centered and wedged tightly between the jig's two tracks, which I screwed to a plywood base. A carriage containing my router's square base between two L-shaped rails slides over the.tracks, the tops of which are curved the same as the carcase sides: ⅝ in. deep over 26 in. The router slides in the rails side to side across the workpiece, but I fastened stops on the rail ends to limit router travel and prevent the bit from cutting deeply into the tracks. I also fastened stops on the track ends, to limit the distance the carriage travels and prevent it from sliding off.

To use the jig, first align a centerline on the carcase side with a centerline on one track. Then secure the side in the jig by driving two opposing 24-in.-long wedges between one edge and a track and by clamping 45° beveled cleats to the base at each end of the workpiece (leave the cleats in place to align the other workpieces). Next, slide the carriage to position the router's ½-in.-dia. straight bit over the workpiece (about ½ in. from one end), extend it until it just touches the workpiece and set the router's maximum-cutting depth stop. Raise the bit and begin routing with the grain on one side, starting near the middle of the workpiece. Depending on your router's horsepower, cut only about ⅛ in. to ¼ in. deep per pass. (My 3-HP router can cut about ¼ in. per pass.) Move the carriage back and forth along the tracks and incrementally move the router sidewise for each pass—like mowing the lawn. Gradually plunge to the maximum depth stop, but remove only 1/16 in. on the final pass. This way, you'll leave a smoother surface that will only need to be lightly scraped and sanded after assembly.

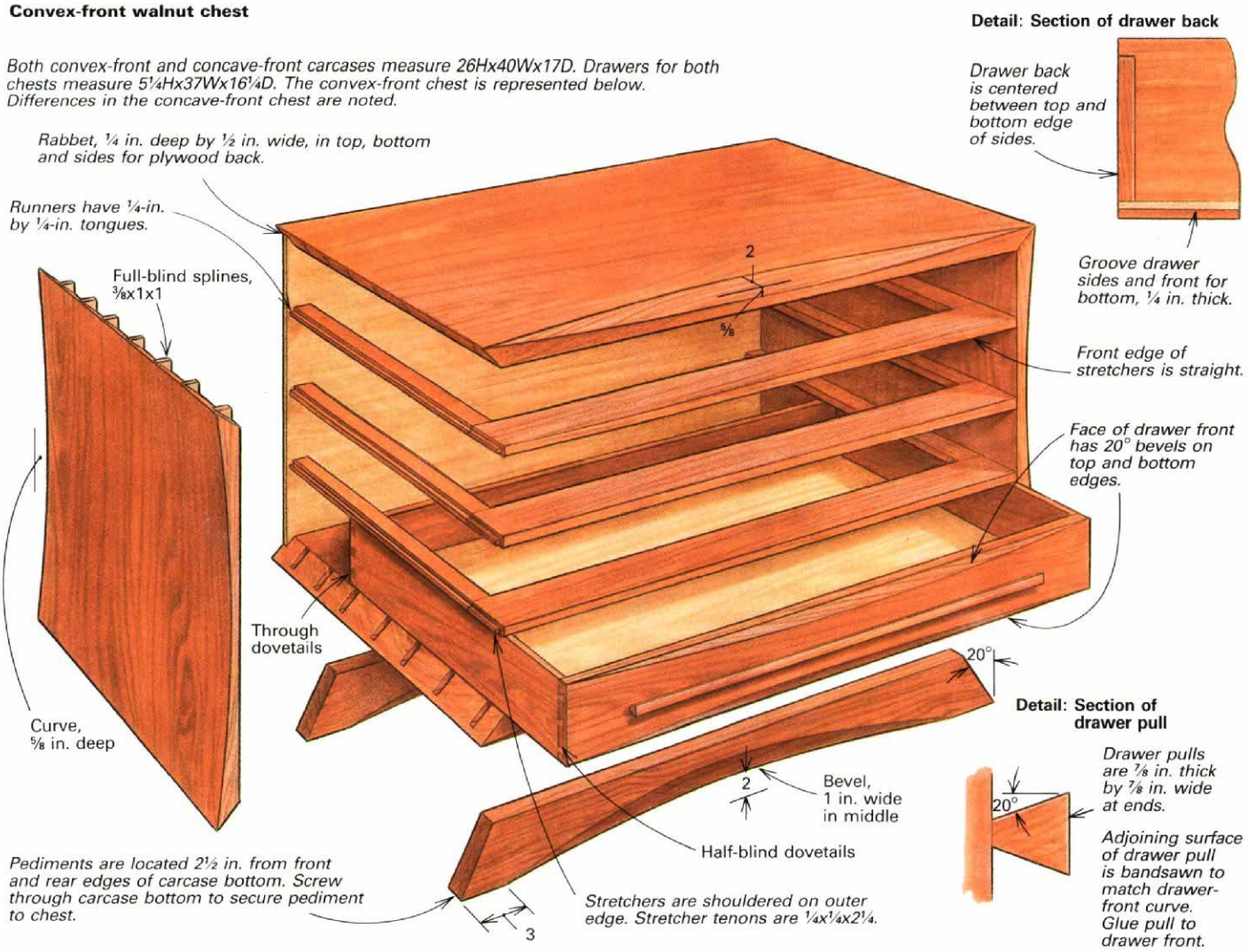
Assembling the carcase—Since carcase assembly is complicated, you should do a dry run, inserting only two splines in each joint. Then, before glue-up, gather everything you will need: the four



Right: A template is aligned on a mark next to the inside corner of a mitered carcase side for routing bidden spline mortises. The line is evident on the piece at right.

Below: Frid routs the concave carcase sides on this shopmade jig. The router carriage slides along the curved tracks and the router slides side to side within the carriage rails. Stops on the track ends prevent the carriage from sliding off and stops on the rail ends limit router travel.

Convex-front walnut chest



carcase pieces, three stretchers, 24 splines, glue, a damp rag, clamps and assembly jigs, and a helper or two (assembly isn't a one-man job). The plywood assembly jigs for the mitered carcase are the same width as and ½ in. shorter than the carcase pieces, with 45° beveled cleats glued and screwed to each end (see the top photo on the facing page). Since the surfaces of the jigs' cleats are parallel to the joints' mitered surfaces, clamping pressure is perpendicular, preventing the joints from sliding.

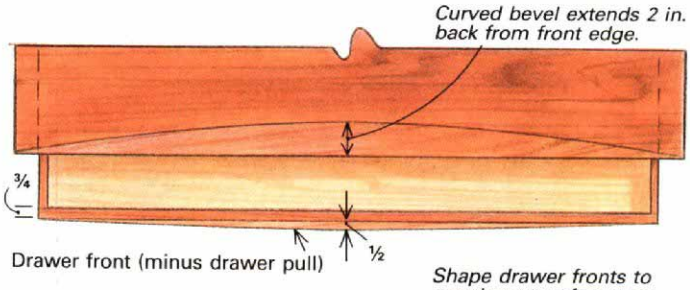
I used plastic resin glue for this project, because its dark color is close to walnut and it dries slower than yellow glue, allowing more assembly time. Using a cheap, small brush, spread glue on the joining surfaces of all parts and insert the splines in the sides' mortises. Then assemble the parts in four steps. First, stand the sides on their rear edges and join them to the three stretchers (without clamps). Second, join the top and bottom to the sides by pressing their joints together. Third, clamp the miters using the assembly jigs. To do this, secure the middles of the long jigs to the top and bottom with a short clamp and secure the short jigs to each of the sides with a pair of long bar clamps across the front of the carcase. But align the stretchers' front edge flush with the carcase front before tightening the bar clamps. Then draw the corners together, using three or four clamps across each jig's cleats and making sure the miters are tight inside and out. You can tap the jig's cleats to persuade the joints into alignment. Finally, ensure that the assembly is square by checking that its diagonals are equal. If it isn't square, change the angle of a long bar clamp or two. Then, with the glue still wet and everything square and aligned, lightly hammer the corner of any slightly open miters to bend the wood fibers and close the joint.

If I had built this chest from lighter wood, I would have used yellow glue, so its color would match the wood. But since it sets quickly, I would glue the opposite corners together first, making sure they were square, and allow them to dry. Then I would assemble the rest of the case as I did the walnut carcase. I never use liquid hide glue because I had a bad experience with it on a large commercial project: after several years, the glue became like chewing gum. Thank heaven I sold my business before anything came back for repairs.

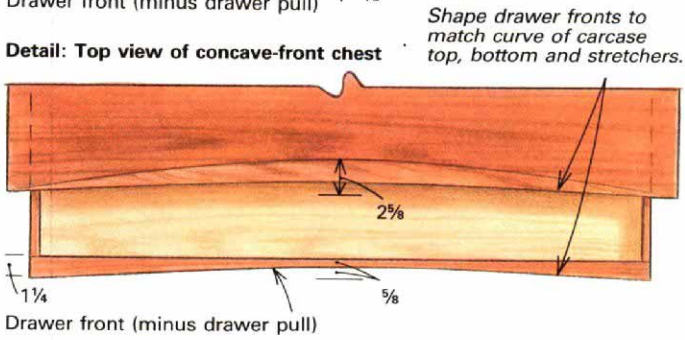
Although my shop was pretty dry when I started this project, the humidity was nearly 100% when I was ready to install the drawer runners. It was so hot and humid that Danish sweat (which is hard to come by and very expensive) was dripping from my brow onto the wood, and even though I knew that the chest would one day live in a drier atmosphere, the walnut carcase had expanded quite a bit. Therefore, to allow for wood movement, the runners are ½ in. shorter than the inside depth of the carcase and glued only at one end. Apply glue to the first inch of the runners' ¼-in. by ¼-in. tongue, butt that end of the runner against the stretcher and tap its tongue into the groove in the side. Before you screw on the back, screw the two shaped pediments to the bottom of the carcase.

Photos: Gary Weisenburger; drawing: Bob La Pointe

Detail: Top view of convex-drawer-front chest



Detail: Top view of concave-front chest



Bill of Materials

No.	Description	Dimensions (T × W × L)
1	Carcase top and bottom	1½ × 17 × 40
2	Carcase sides	1½ × 17 × 26
24	Splines	⅜ × 1 × 1
3	Stretchers	¾ × 2½ × 37½
6	Runners	¾ × 1¼ × 14¼
2	Pediments	1½ × 4½ × 38½
1	Carcase back	¼ × 24 × 38 plywood
4	Drawer fronts	1¼ × 5¼ × 37
8	Drawer sides	½ × 5¼ × 16
4	Drawer backs	½ × 4¼ × 37
4	Drawer bottoms	¼ × 15 11/16 × 36 3/16 plywood
4	Drawer pulls	⅞ × ⅞ × 28

Above: *To check the carcase for square, Frid measures across the diagonals. He placed the thin-plywood assembly jigs on the outside of the carcase. The jigs are the same size as each carcase piece, with beveled cleats on each end.* ***Below:*** *After routing the convex shape on a drawer front, Frid rips a 20° bevel in its top and bottom edges so the front's edges are straight and flush with the straight carcase front.*

Making the drawers—Before shaping the drawer fronts, fit all the drawer parts to the carcase, cut each drawer's dovetail joints (I cut them by hand: half blind in front, through in back), and then groove the sides and front for the bottom, as shown in the drawing. If you cut the drawer parts following the bill of materials, they will be slightly tight in the carcase openings. So trim the unshaped fronts to fit snugly in the carcase; trim the sides as wide as the fronts, for a snug fit between the runners; and cut the backs as long as the fronts. To allow for wood movement in the carcase, the drawer is ½ in. narrower than the carcase's inside depth, and the drawer backs are 1 in. narrower than the width of the drawer sides. This leaves ½ in. above the back, to keep the drawer from binding if a shirt sleeve falls overboard, and ½ in. below, so you can slide the bottom into the assembled drawer and screw it to the back from underneath.

To shape the convex drawer front, I used a jig that is similar to the one I used to scoop out the concave carcase sides, except that the drawer front jig's tracks have convex curves (½ in. deep over 37 in.). Set the router's maximum-cutting depth stop by positioning the cutter ½ in. from the centerline of the workpiece and extending the bit until it just touches. After routing the convex surface, rip 20° bevels in its upper and lower edges, setting the tablesaw fence a little more than ¾ in. from the blade (to leave the edges that thick after planing them smooth), as shown in the bottom photo above. Now, smooth the surfaces, but keep the corners sharp, because they emphasize the curves that give the chest's front its interesting shape. To shape a concave front, use a jig with concave curved tracks and set the cutter depth at the end, as you did on the carcase sides. Don't cut bevels in the edges of the concave drawer fronts.

I made wooden drawer pulls that fit the overall design. To make them for the convex fronts, mark a matching concave curve on the edge of a ⅞x4½x28 piece of walnut. Bandsaw to the line and scrape the surface smooth and fair. With the tablesaw blade perpendicular to the table, rip the concave piece into four 1-in.-wide pieces. Then, tilt the blade to 15° (angled toward the fence) and set the fence ⅞ in. from the blade. With the concave side up, rip both edges of each piece, and then crosscut their ends at the same angle. Scrape and sand the sawn edges, and glue and clamp the pulls on the fronts before you apply the finish.

Finishing—I finished both chests with Watco oil. Never finish the inside of the carcase or outside of the drawer sides, because they may stick together. Instead, rub them with paraffin. And never use an oil finish on the inside of the drawers, because it always bleeds and may spoil what is inside. Instead, you can seal the drawers' insides with shellac or lacquer. You needn't worry about moisture inside the chest, however, because the drawers are closed most of the time. □

Tage Frid is a contributing editor to FWW.