



Quick and Tricky Little Boxes

How I bookmatch scrap wood into Christmas gifts

by Jim Cummins

I'm an impatient putterer with thrifty inclinations. Over the past year I've gotten a big kick out of converting my scrap pile into a bunch of Christmas presents. Inspired by Sam Bush's matched-grain box from *FWW* #32 (figure 1, facing page), I began exploring variations in the design and construction of small boxes, aiming to have fun while not making the same box twice. I ended up with a dozen variations, most of them figure-matched in one way or another, with different designs for lids and bottoms, and different joinery details. Some required a little thoughtful planning, some were last-minute adaptations based on chance, and a couple of my favorite details grew out of my efforts to fix mistakes. The elements can be combined in lots of ways, and there isn't a box here that can't be made in an hour or two, not counting the finishing, of course.

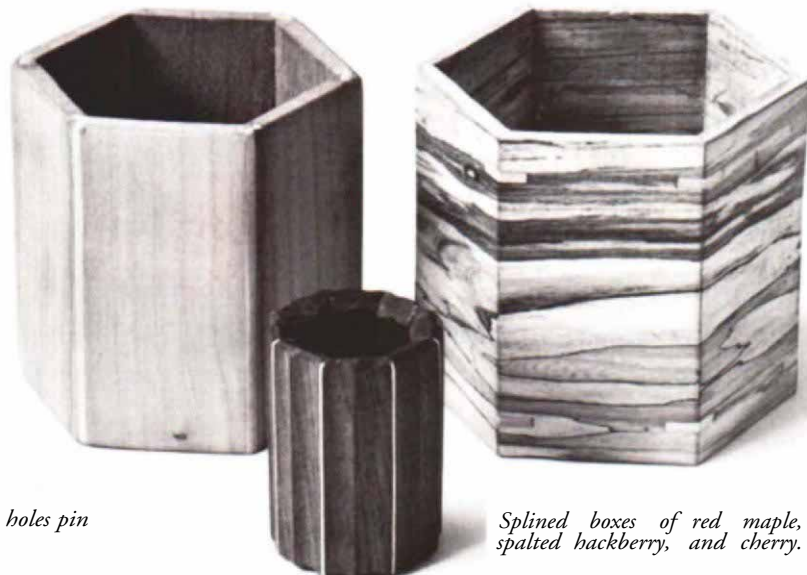
The first variation—Sam Bush's box in figure 1 comes out of a board, but my first bookmatched box, shown in figure 2, came from a walnut turning scrap about 2 in. square by 9 in. long. First I bandsawed it into four strips, and planed them smooth on both sides. On one pair of strips, I laid out the

box sides and ends the same way Bush did. The other pair of strips I edge-glued, using masking tape to clamp the joint (p. 34). This bookmatched piece was as wide as the ends of the box, and long enough to cut in half to become the bottom and lid. While the strips dried, I rabbeted the top and bottom edges of the sides and ends as shown in figure 2A, then I mitered and glued them, again with tape, adding rubber bands for more pressure. While the sides cured, I rabbeted the lid and the bottom to fit into the rabbets in the sides. I glued the bottom in, using tape damps, put the lid on and sanded the edges flush.

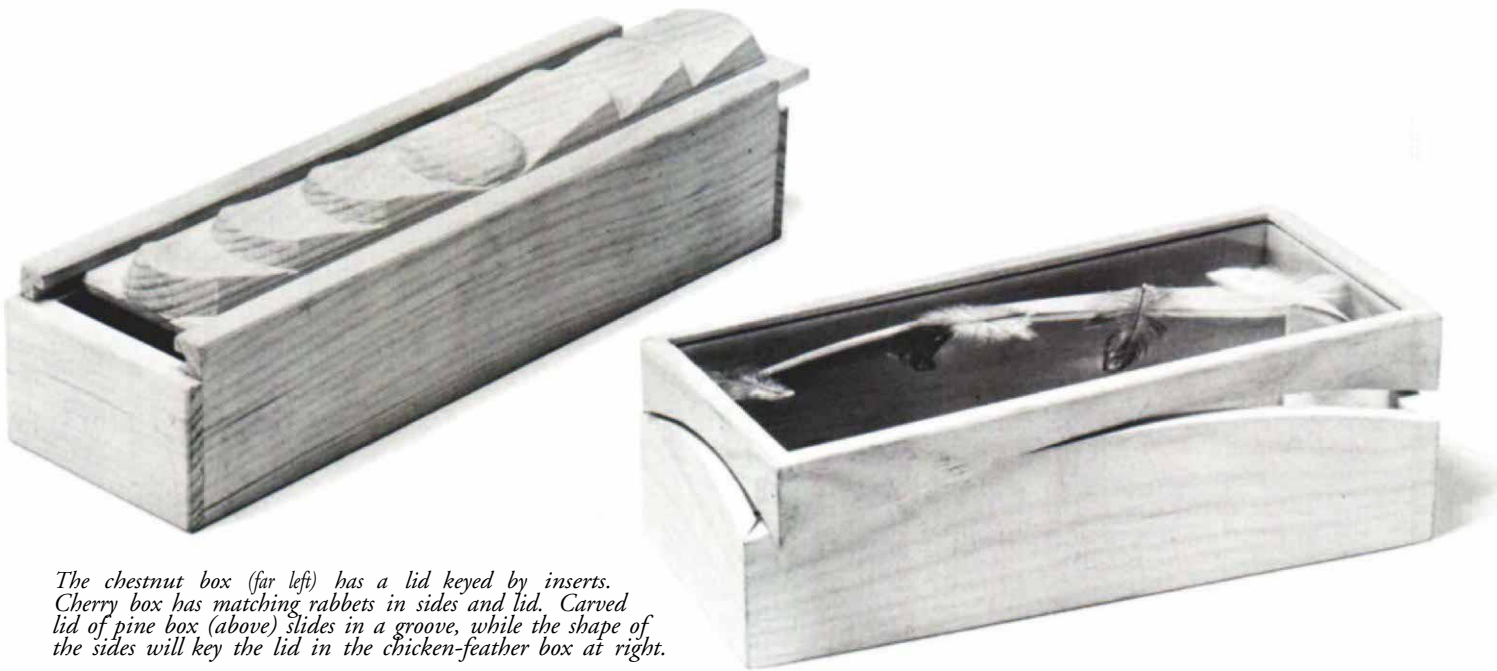
When I was done, I realized that I'd made three dumb mistakes. First, I hadn't examined the direction of the grain in the turning square. Bookmatching, because of the sawkerf, is never perfect, but if you arrange the grain as shown in figure 2B, it will be close. I had sawn the blank at an intermediate angle to the annual rings, which gave me pretty wood, but a poor match. My second mistake was in jointing and thickening the stock before I joined the sides. Bookmatched figure matches best right at the sawkerf, so you want to remove minimum wood from the show surfaces. I should



Square pegs in round holes pin these lapped corners.



Splined boxes of red maple, spalted hackberry, and cherry.

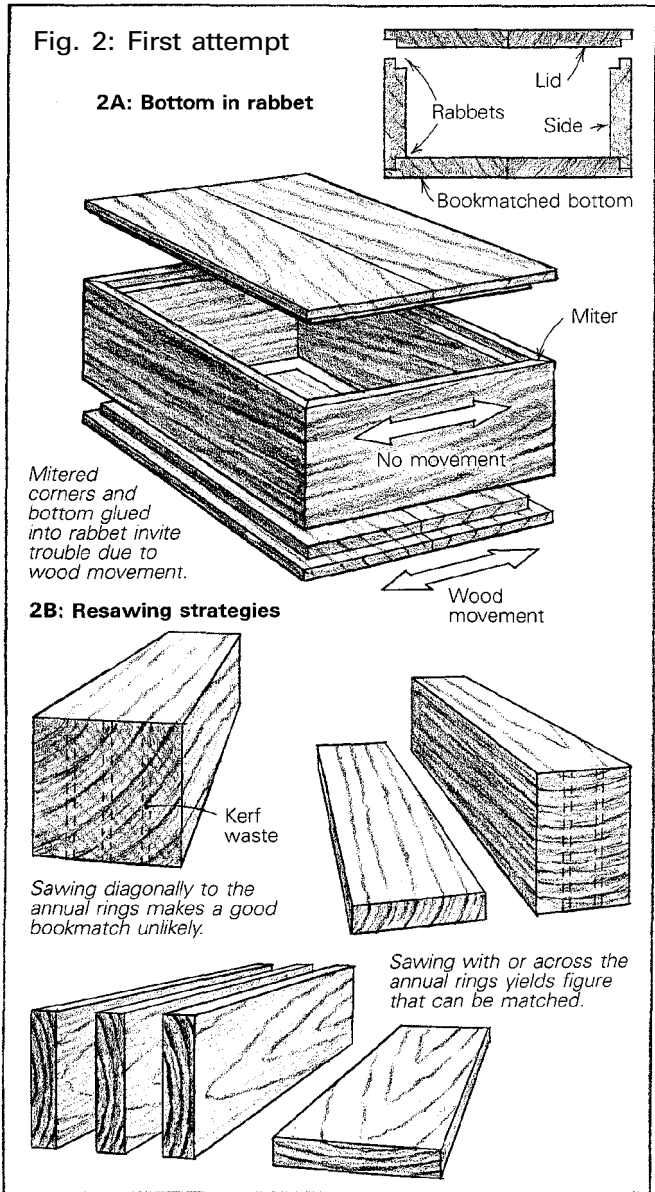
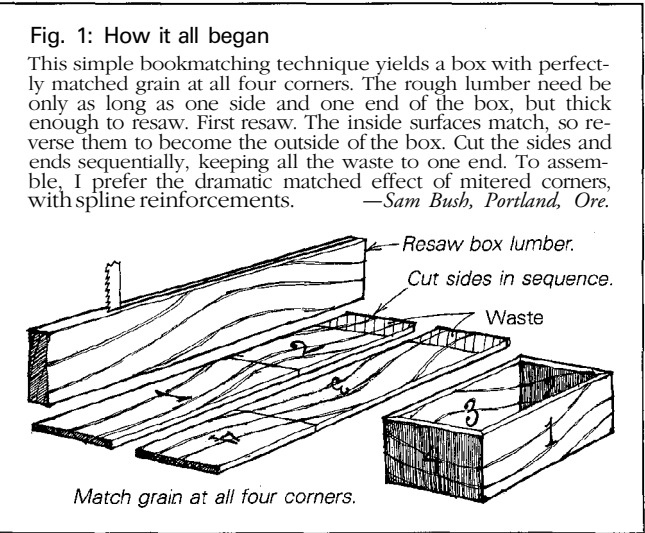


The chestnut box (far left) has a lid keyed by inserts. Cherry box has matching rabbets in sides and lid. Carved lid of pine box (above) slides in a groove, while the shape of the sides will key the lid in the chicken-feather box at right.

have smoothed the inside surfaces only, and waited until the box was joined before sanding the bandsaw marks off the outside surfaces. A more careful workman than I might plane both sides of the stock smooth before bandsawing, and might be sure to resaw exactly in the middle of the thickness. Then he could skim off the sawmarks before gluing up. Others might just tablesaw the stock to thickness in the first place. Since people argue about which resawing procedure wastes the most wood, I tested several tablesaw blades against my bandsaw. I found that by the time I'd planed away the bandsaw marks, I'd lost more wood than to an ordinary ripping blade. Two carbide blades—the Freud thin-kerf and the Forstner/Mr. Sawdust—left surfaces clean enough to sand.

The third mistake was the rabbet for the top and bottom: it left no allowance for wood movement. Even in this small box, the width of the top and bottom could drift $\frac{1}{16}$ in. from summer to winter, and sooner or later the glue joint would break, or the lid would stop fitting, or both. I knew all this, but I'd been too interested in the figure match to bother about it. Anyway, it is humid summer as I write, and nothing untoward has happened to my walnut box yet.

(continued on p. 35)



Coping with movement—In the next box, I made room for both the lid and the bottom to move (figure 3). I used some bird's-eye maple picture-frame molding, which was barely thick enough to yield $\frac{3}{16}$ -in. thick strips for the sides. I ran the rabbet for the lid and the groove for the bottom, cut the miters, and taped the corners together without glue. Then I cut the bottom and top to fit. I removed the tape from one corner of the box and unfolded the box flat on the bench. I applied glue to the miters, fit the bottom into its groove without glue, and rolled the box up tight, taping the last corner.

Because the sides were so thin, I felt I should reinforce the glue joint at the corners. So while the glue was setting, I grabbed a 2x4 scrap and made a jig (facing page) for sawing a couple of slots for cross-splines through each corner. Then I puzzled over what to do about the lid. As things stood, there was no way of getting it out of its rabbet, short of turning the box upside down.

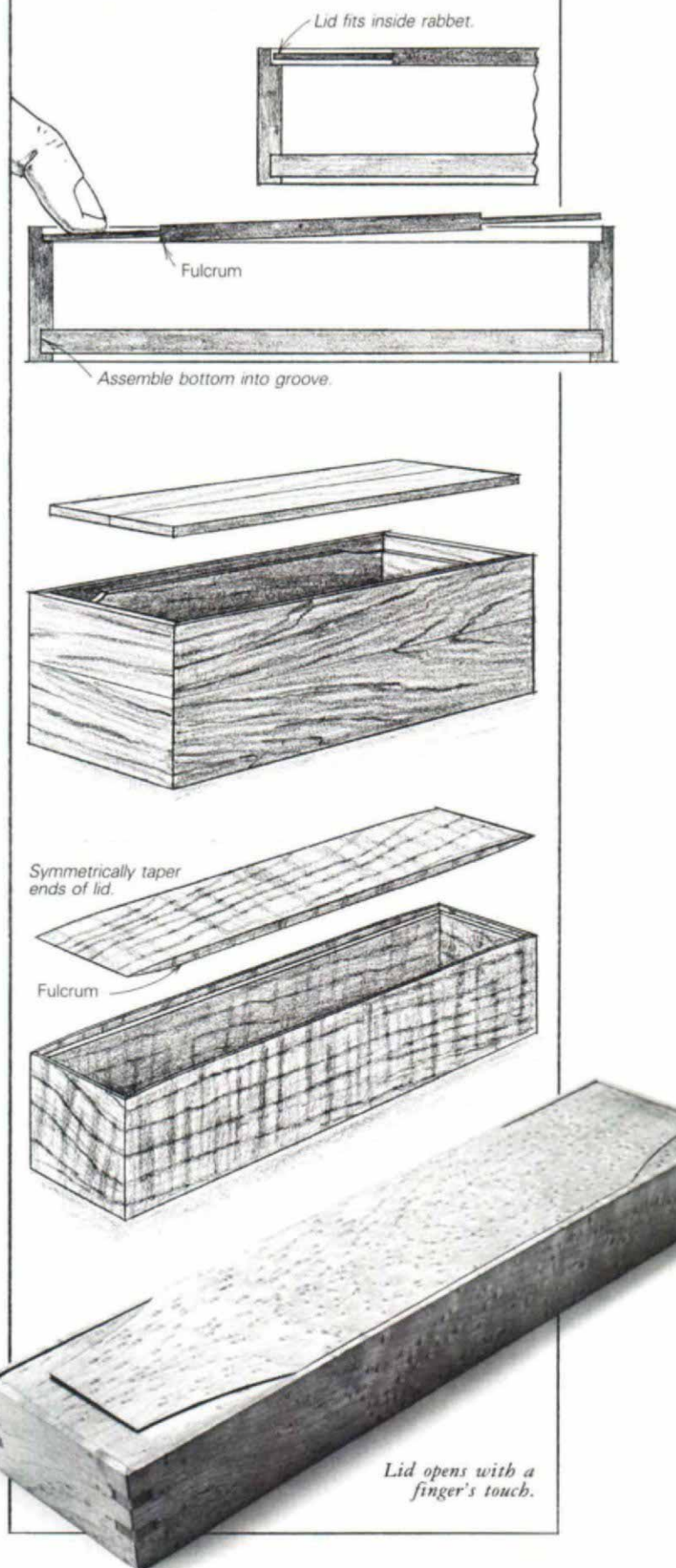
I debated drilling a finger hole through it, but then remembered that Desmond Ryan (*FWW* #33, pp. 59-65) had worked out a lever-action lid with a built-in fulcrum. If you pressed one corner of the lid down, the other end would rise out of its rabbet. I used the same idea, and the relief cuts turned out to be decorative as well. To make them, I raised the tablesaw blade $\frac{3}{8}$ in. above the table, and clamped a stop to the fence at about the location of the arbor. Feeding with the stock faced against the fence produced the curved shape, which is simply the profile of a 10-in. sawblade. I cut the detail on both ends and both sides of the lid, so it fits either way, and works no matter which way around it's put (figure 3A).

Two other variations of the lever-action lid are also shown in figure 3. In 3B, the fulcrum is built into the rabbet instead of the lid. Make the relief cuts on the tablesaw before the box is joined, and be sure to relieve the ends as well. In 3C, the fulcrum is in the lid, but it isn't obvious. The lid is symmetrically tapered on both faces of both ends, so that it fits either way, and the projecting lip of the rabbet is shaped to conform to the lid's curve.

It can be perilous to tablesaw box-sized pieces of wood, if you don't take precautions. When you're resawing or making relief cuts, the stock might slither down beside the sawblade, which you can prevent by making a new, tightly fitting table insert. Bandsaw the outline from $\frac{3}{4}$ -in. plywood, file or sand it to a good fit in the saw's throat, shim it (or relieve it) so that it sits flush with the table, then raise the blade through it to cut a snug slot. When ripping small pieces to width, be sure that the bottom of the fence is tight to the saw table, otherwise the work can slide under it and bind. Small pieces are notoriously prone to catch and kick back, so push sticks are essential. My favorite is a sharp ice-pick. With it you can hold the work tight on the table at the same time as you feed it forward. Strive to keep the work moving steadily through the blade, to avoid blade-marks and burns.

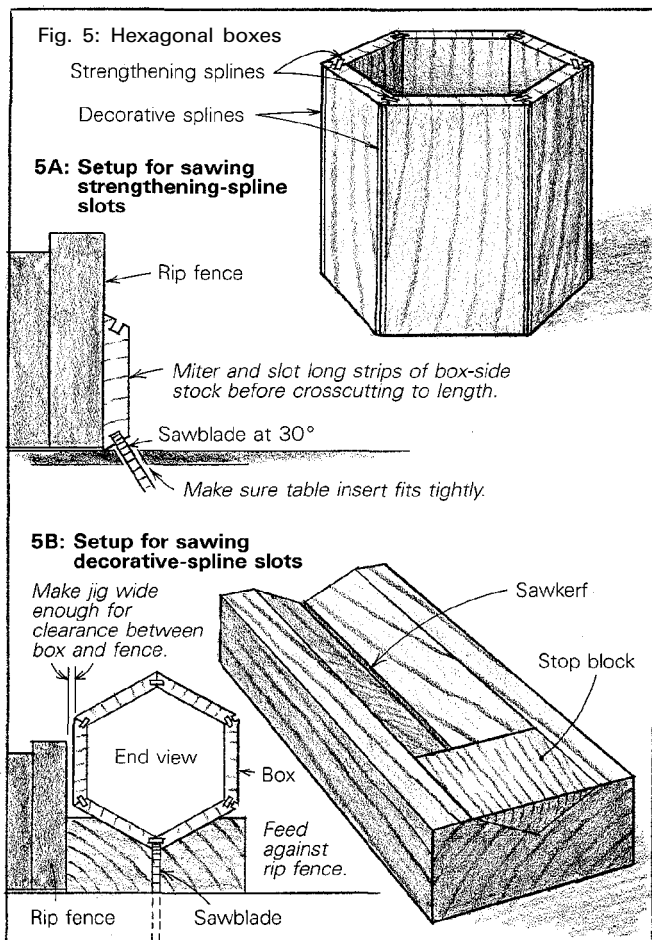
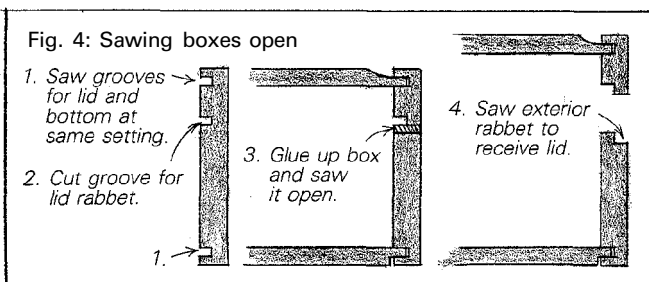
Frame-and-panel lids—Another type of lid that accommodates wood movement is the frame-and-panel assembly, essentially what I used for the bottom of the box in figure 3. Here are a couple of ways to secure such a lid without hardware. The little cherry box shown at the top of p. 32 has a rabbet in the lid that fits over a matching rabbet in the box. In a large box, it's easy enough to cut the rabbet in the lid before it is joined up around its panel, but in a small box the lid pieces are tricky to handle. It's better to glue up the whole

Fig. 3: Lever-acting lids



box, then cut the lid off later, complete with rabbet.

The procedure, as shown in figure 4, is to groove the inside of the box at three places—top (for the panel in the lid), bottom (for the box bottom), and along the lid's rabbet line. Join up the box, then after the glue has set, cut the box open to leave the rabbet in the lid. Finally, run the box part over the tablesaw to make the exterior rabbet that receives the lid. By varying the width and depth of the cuts, this method can be generalized up to blanket-chest size, where it ensures that box and lid are not only figure-matched but also the same size. Some people find it most efficient to saw the groove for the exterior rabbet in the box sides before glue-up, while the square-bottom grooving blade is on the arbor. This saves a blade change, and also leaves no doubt about where the lid begins and ends when you saw the box open. Allow for the box-opening kerf when you lay out the grooves. If you use the tablesaw to separate the two pieces, cut one side at a time, and shim each kerf open before cutting the next, to keep the box



from closing and pinching the sawblade. If you handsaw, first scribe a line all around the box with a sharp marking gauge.

Frame-and-panel lids don't have to be straight. The chestnut box shown on p. 32 was cut open in a curve on the bandsaw. To form the lip that secures the lid, I inserted false sides in the box, then trimmed them to conform to the curve. Of course, false sides work just as well in a box that's been sawn open on a straight line.

In any frame-and-panel design, whether for a box lid or a piece of furniture, the way the edge of the panel is shaped affects, even determines, the look of the piece. Some of the options are considered on the facing page.

Hexagonal boxes—A dead hackberry tree yielded such strikingly spalted wood that I thought I'd try matching the corners all around a hexagonal box (p. 32). The method works just like Bush's, except that you lay out the box to get three equal sides from each half of the resawn blank's length. In my box, because the pattern in the wood ran at an angle, each sawcut threw off the match a little bit. As I taped up the sides, I found that I could accommodate the loss by shifting each side upward in order to align the figure. This trick finally caught up with me at the last corner, which ended up being not a good match at all.

When the box's top and bottom edges had been trimmed straight on the bandsaw, I removed the tape at one corner, unrolled the box flat, and tablesawed a groove for the bottom. I had no hackberry left, so I made a glass bottom instead: I rolled up the box dry, traced its outline, laid a piece of glass on the tracing, and cut out a hexagon, allowing for the depth of the groove. The glass hasn't broken, even though this box does daily work holding pens and pencils. I've since added cross-splines to each miter joint, because spalted wood cut $\frac{1}{4}$ in. thick needs all the help it can get.

In another box, shown in figure 5 and on p. 32, I planned to put lengthwise splines in the miter joints, both for strength and to make a pretty detail at the top rim. The box went together dry, but when I added glue, the splines swelled and forced open the joints at the outside corners. As I strained to get the joints tight, I became covered with slippery glue squeeze-out, masking tape and rubber bands, but I knew that if I tried to retreat, the mess would be even worse. I clamped up as well as I could and hoped for the best.

The corners dried open, but the splines were holding the box sturdy and tight. I rescued it by making another 2x4 jig (figure 5B), this one oriented to run a sawkerf the length of each corner. With the second round of splines in place, the box looks as if I'd planned it that way. For thin splines, such as in the little cherry box shown on p. 32, you can kerf the corners on the bandsaw—no jig necessary.

A self-keying lid—While I was making the chestnut box with the false sides, I noticed that the top automatically aligned itself in one direction because of the crown in the bandsaw cut. I reasoned that if I could get the crown on both the long sides and the short sides (pine chicken-feather box, p. 33), the top would align without my having to insert false sides. This meant that I would have to make the bandsaw cuts before the box was joined.

I resawed a piece of #2 common pine, about 3 in. wide and 14 in. long, then cut the sides to length, matching the grain the way Bush did. Then I ran a groove for the top and

bottom. Next I bandsawed a curve on each side, taking care that adjoining cuts would meet at the box's corners.

The marks from the bandsaw blade were very obvious, but planing or sanding the edges would have altered the fit of the lid. Instead I ripped thin slivers of pine (half the thickness of the bandsaw kerf) to mask the rough edges on both the lid and the box. I glued the edge-banding in place before I mitered the corners, using tape for alignment and a vise for pressure. Because all four sides were the same height, I could glue up the first side, clamp it in the vise, then simply add the other sides to the stack as I got them ready.

While the stack was in the vise, I cut a mirror for the bottom and a piece of old picture glass for the top. The picture glass was so thin that it rattled, but, luckily, two pieces

filled the kerf perfectly. To add some decoration, I stuck a few chicken feathers between the panes.

If I were making this box again, I'd do a couple of things differently. It is almost impossible to match the figure around the corners and match the bandsaw cuts as well. I'd forget about the figure, and concentrate on matching the bandsaw cuts—they're more important. Also, I'd seal the edges of the double glass with clear tape before I slid it in. When I sanded the resaw marks off the outside of the box, dust worked between the pieces of glass and muddied the clarity. I'd also take the time to catch a clean chicken, rather than just picking up any old feathers off the floor. □

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