



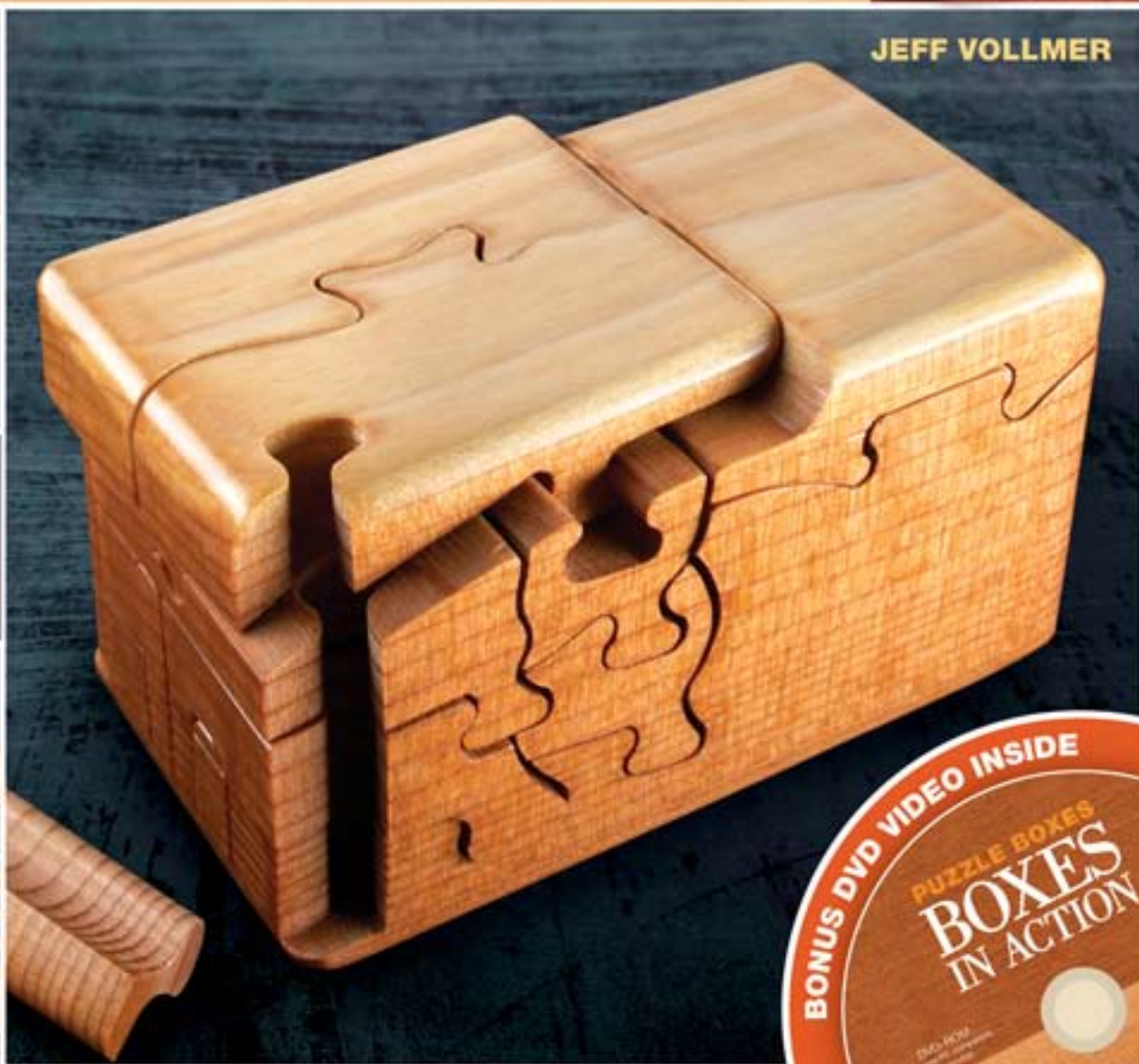
POPULAR
WOODWORKING

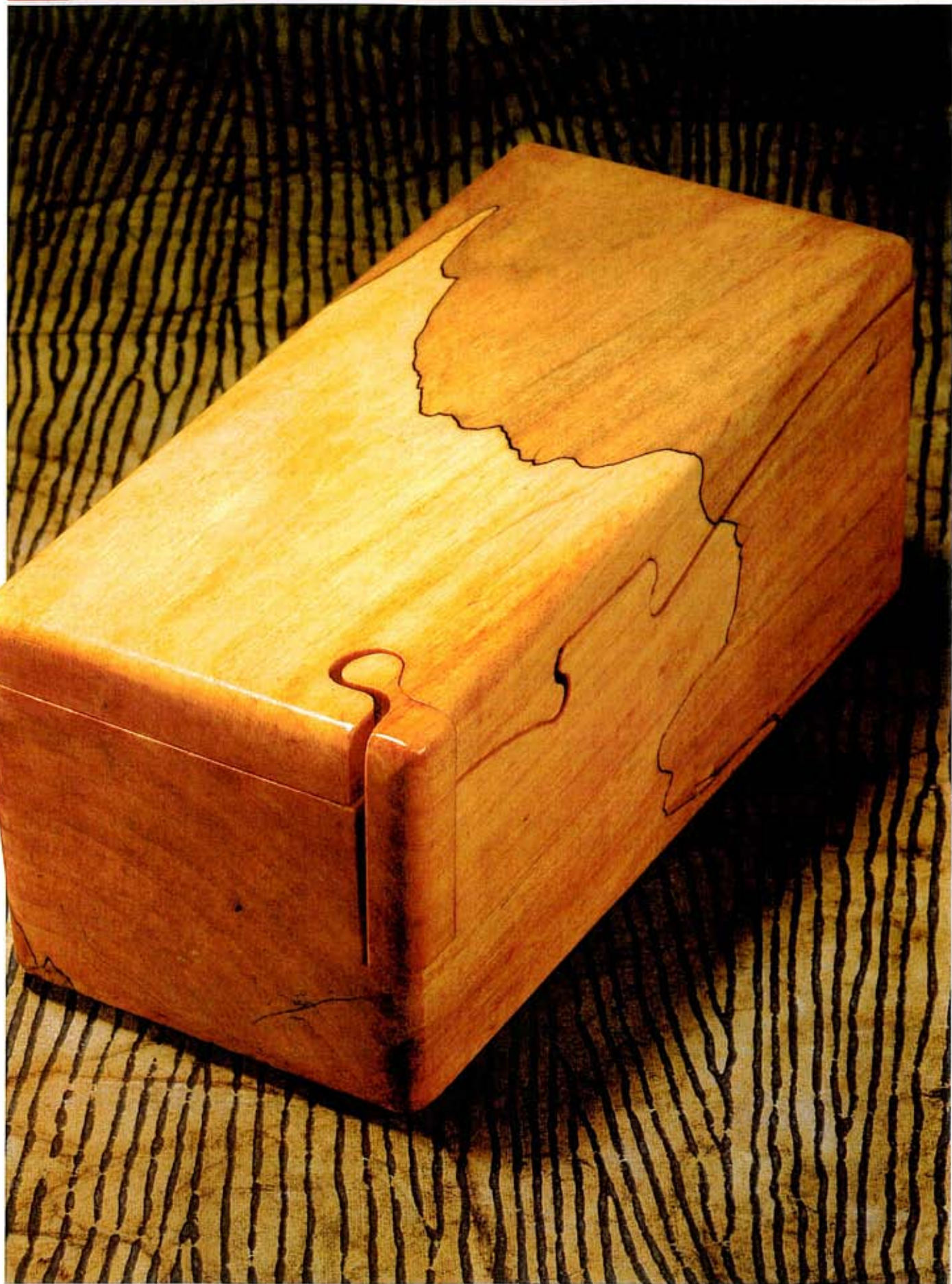
PUZZLE BOXES

12 FUN AND INTRIGUING
BAND SAW PROJECTS



JEFF VOLLMER

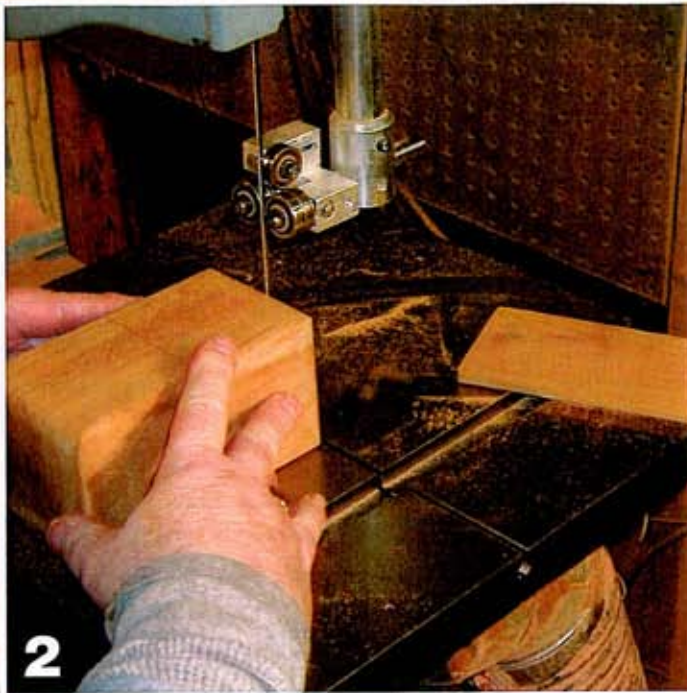




ROUND-DRAWER SPRING BOX

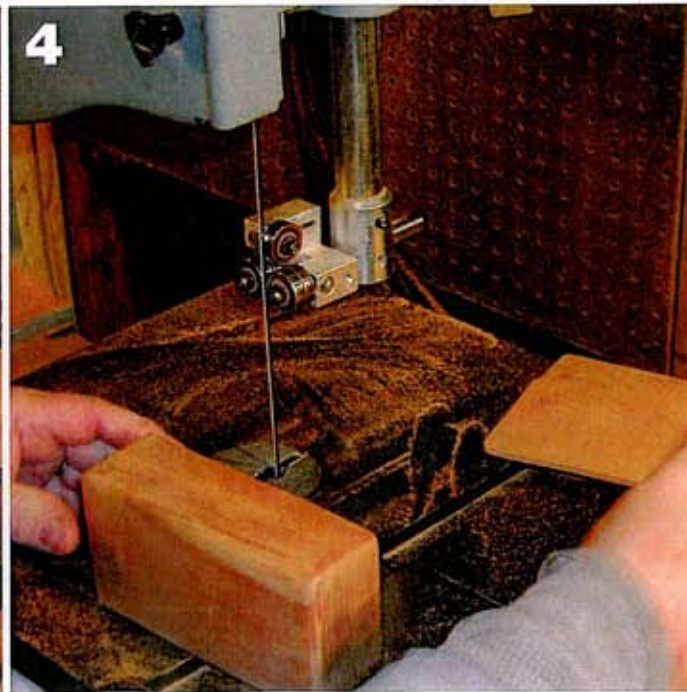
The round-drawer spring box is a puzzle box on top of a spring-loaded drawer. You'll be challenged to create a layered box that will give you further insight into the world of puzzle boxes. As you can see here, spalted maple makes an attractive box. Enjoy!

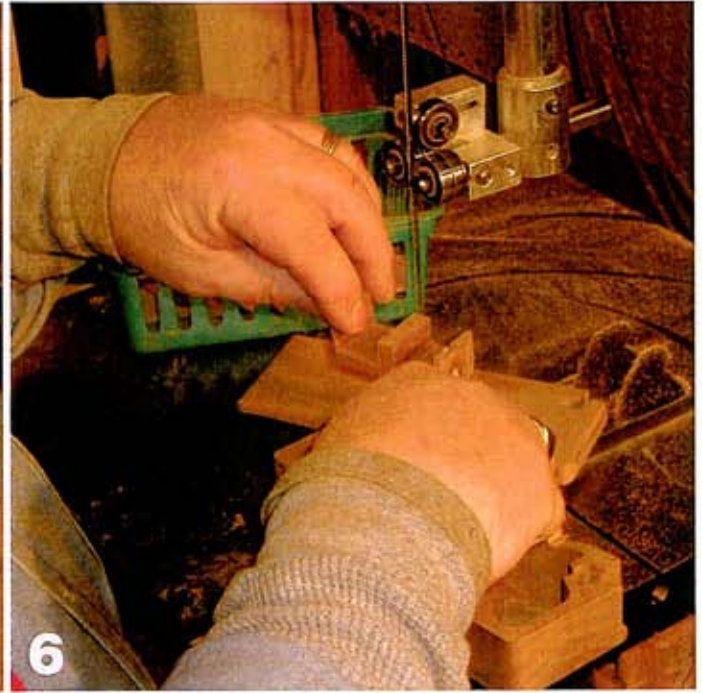
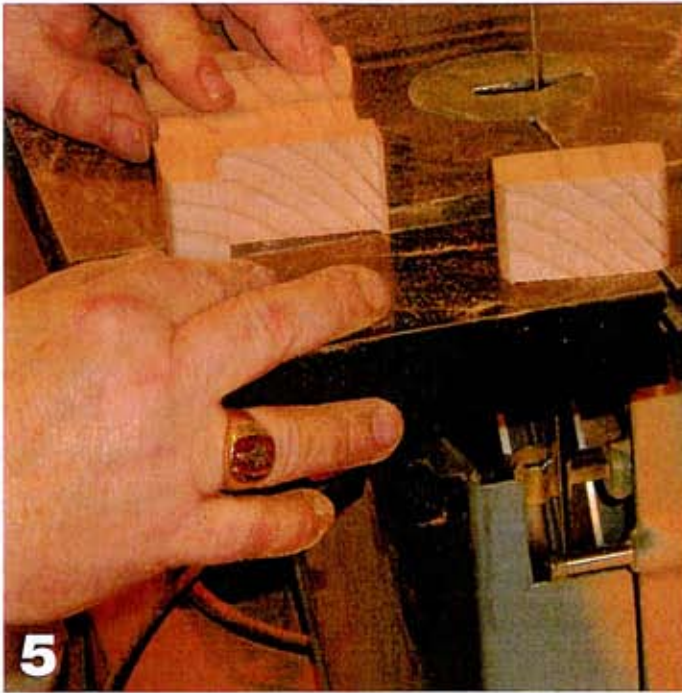




STEPS 1-4 On the side of the 4x4, 6"-long box blank, draw three horizontal lines. The first line is approximately $\frac{1}{4}$ " from the bottom of the blank. Draw the second line about 1" from the bottom of the blank and the third about $\frac{1}{4}$ " above the second line. Draw a fourth line down that intersects these three lines. This line will help you orient the parts at assembly time. Cut the three horizontal lines as straight as possible.

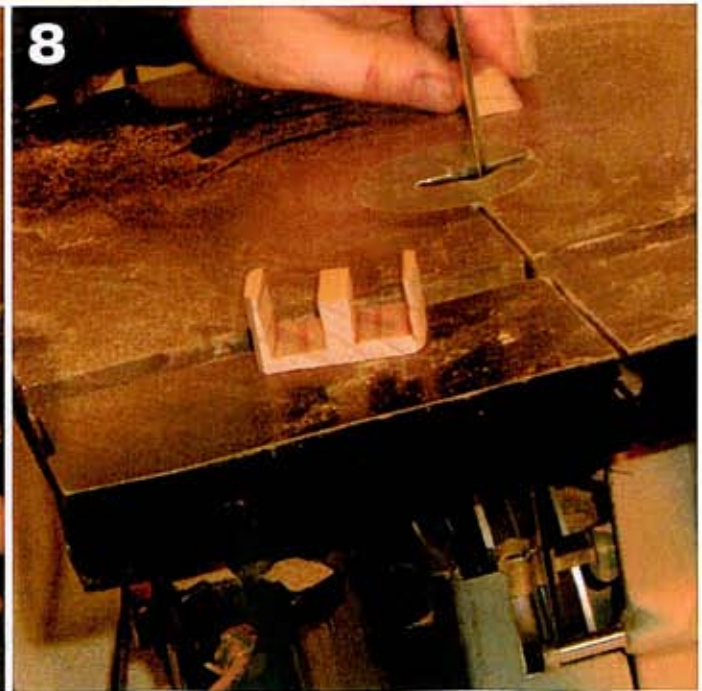
Cut a dovetail key from one corner of the thick top piece. Then cut a lid from the top piece that runs the length of the box and has a sliding dovetail about $\frac{2}{3}$ in from the end you have chosen as the back. Enter through the dovetail key and cut out the guts.

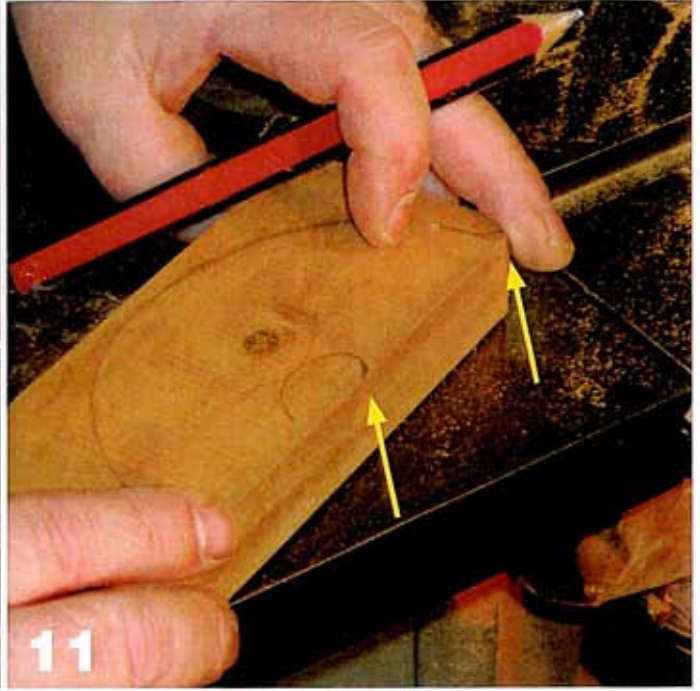




STEPS 5-6 Cut out a corner from the guts. This compartment conceals a key that locks and unlocks the sprint-loaded drawer. To make this key, cut out the framework wall as you would for a small inner box. Pull the block of wood from inside the framework.

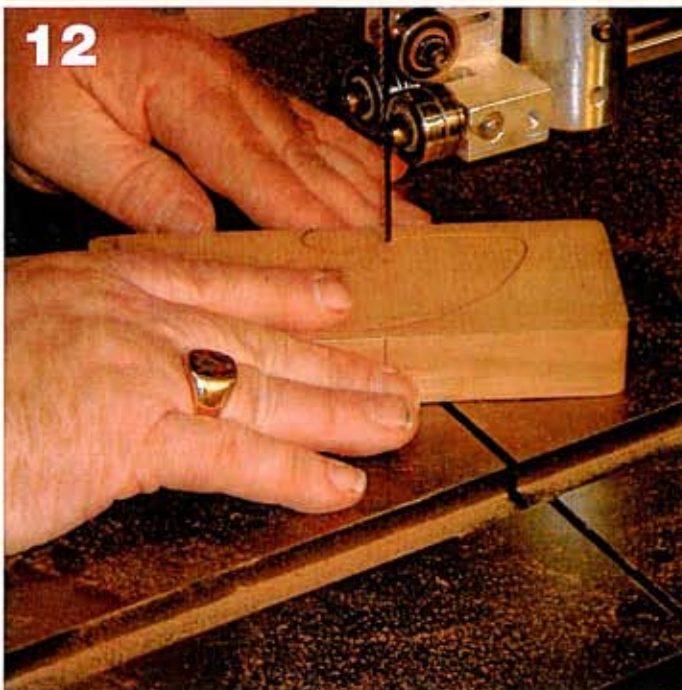
STEPS 7-8 Cut off the top of the piece to make a small lid. Turn the leftover piece on its side. Begin at the center and mark off $\frac{1}{8}$ " on either side of the center point. Cut inward from these points until you reach approximately $\frac{3}{16}$ " from the bottom. Back the blade out and make a parallel cut $\frac{1}{8}$ " in from each end. Now cut out the wood on either side of the center between each of those sets of parallel cuts. Study the photos to help you visualize the cuts. Set these pieces aside for the moment.

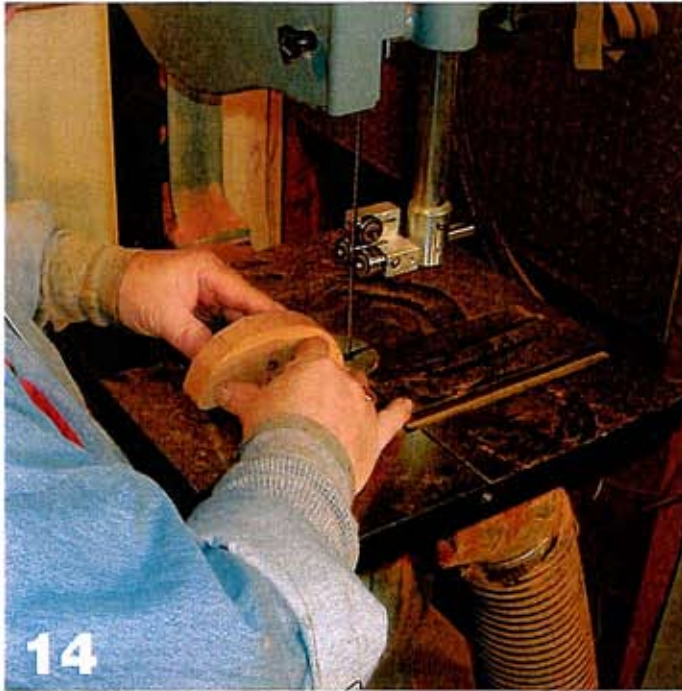




STEPS 9-11 Turn your attention back to the bottom 1"-thick piece of wood. Identify the side where the key and the little compartment from the upper section will be located. Using a compass, draw a semi circle as large as the wood will allow. Draw it so the drawer will exit beneath the small divided compartment above it. Then draw a concentric semi circle that is about $\frac{3}{4}$ " in diameter. Where the drawer comes out of the wood, make a flare that creates a lip (see step 11).

STEPS 12-13 Up until now we've been using an $\frac{1}{8}$ " x .025" x 14T blade. To cut an inner drawer like this one, you need to use an $\frac{1}{8}$ " x .020" x 14T blade. This thinner blade will not make turns that are as tight as the thicker blade, but the kerf is smaller, allowing the drawer to fit better. Cut out the drawer. The arm shown in step 13 (see arrow) is a drawer stop and the "bulge" on the end of the arm is the pivot for the drawer.

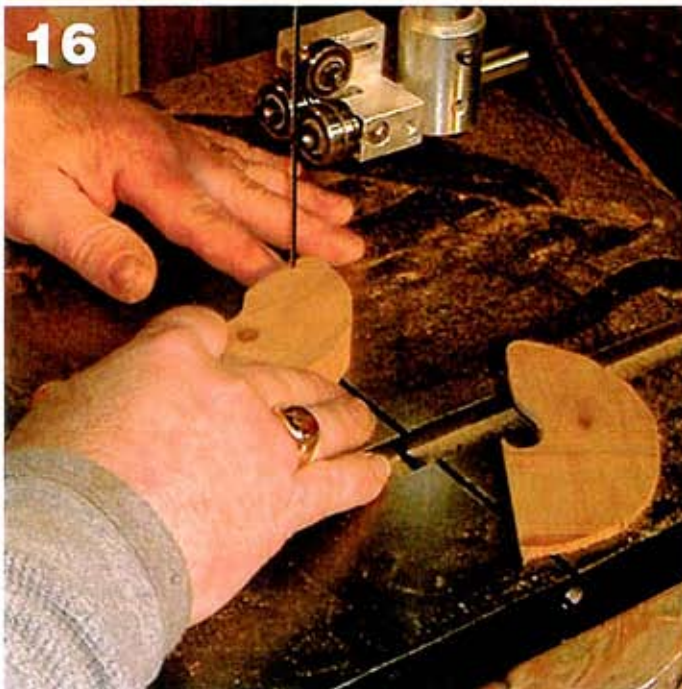


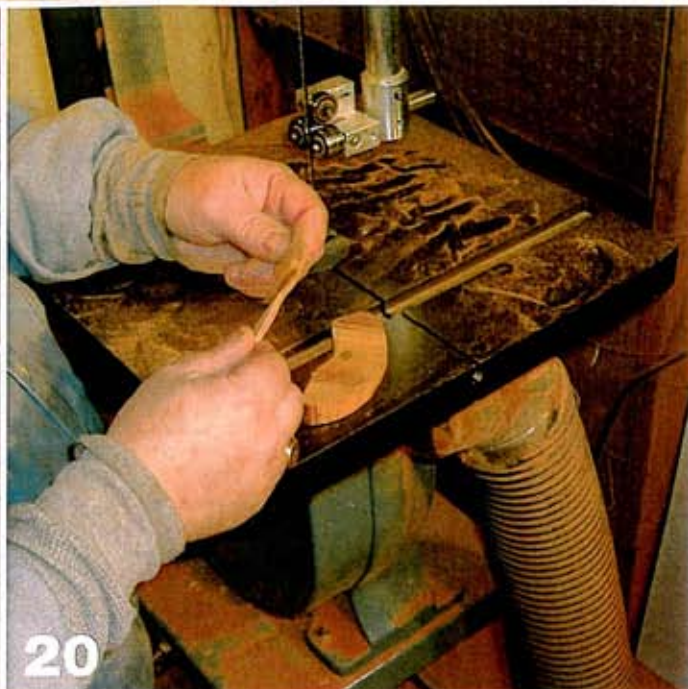


STEPS 14-15 Make the drawer bottom about $\frac{1}{8}$ " thick.

STEP 16 Cut a small sliver from the back of the drawer that tapers from an $\frac{1}{8}$ " to 0", with the thicker part beginning at the outer semi circle and the thinner part at the inner semi circle. This allows relief for the drawer to fit snugly into the box, concealing the drawer so it is not easily seen.

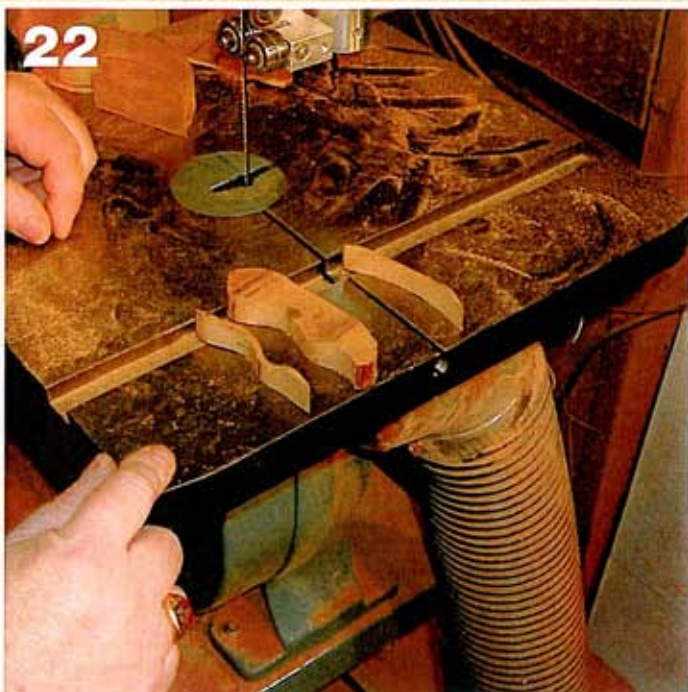
STEP 17 With the bottom held back in place on the drawer, the missing sliver is shown more easily. The extended bottom is a drawer guide that can be carefully sanded to provide a perfect fit of the drawer in the box.





STEPS 18-20 Cut out the inside of the drawer, starting at the back of the drawer and, leaving the back about $\frac{1}{2}$ " thick, tapering down to follow the small inner curve and tapering again to leave the wood $\frac{1}{2}$ " thick at the outer face of the drawer, continuing around the rest of the curve at $\frac{1}{8}$ " thick. Remember to leave a tapered lip at the end of this cut so that you have something to clamp onto when gluing. Back the blade carefully. Remove the center of the drawer and cut a handle into the top. Cut this top off to make the lift-out lid.

STEPS 21-22 Cut the two shoulders for the drawer to hold up the lift-out lid.

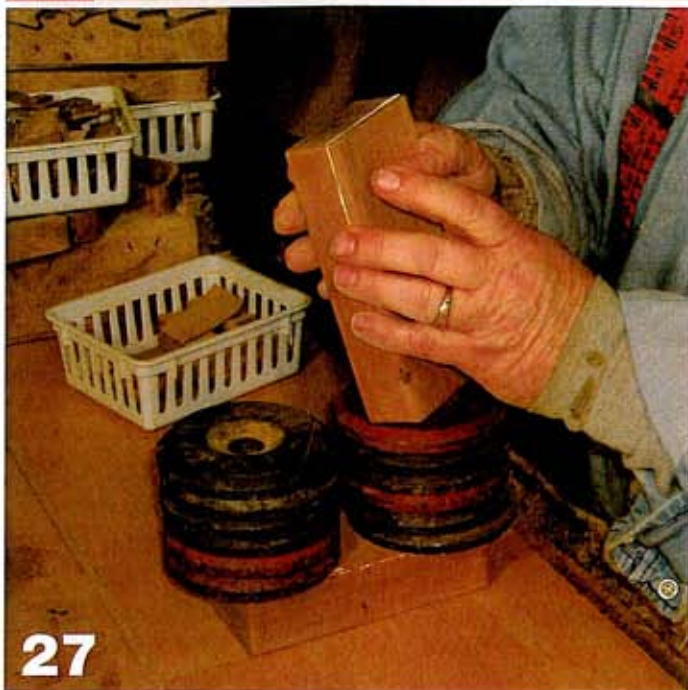




STEPS 23-24 Remove the burrs and glue the bottom onto the box. Add weights.

STEPS 25-26 Before gluing the bottom onto the drawer section, sand the outer radii of the semi circle where the drawer will insert into the box. Remove just the saw marks to reduce friction, letting the drawer slide in and out smoothly. Now glue the bottom onto the drawer section, again wiping to avoid glue squeeze out inside the box.





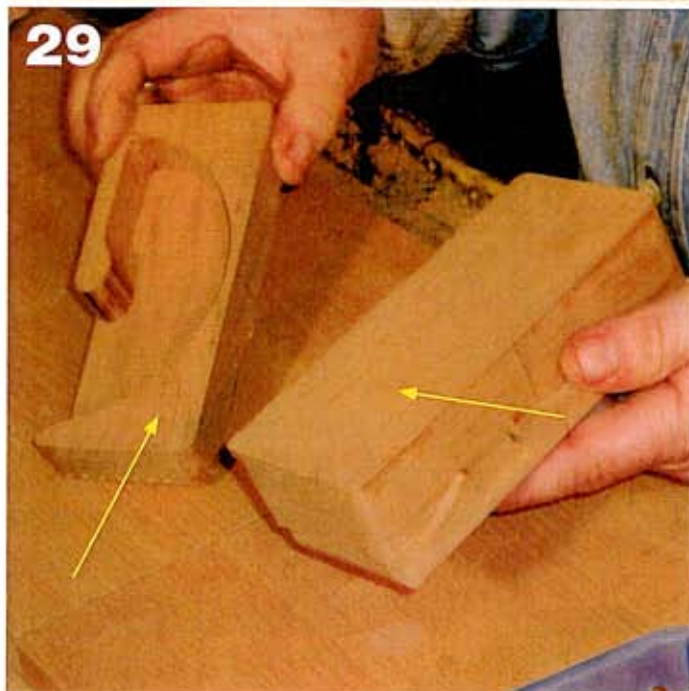
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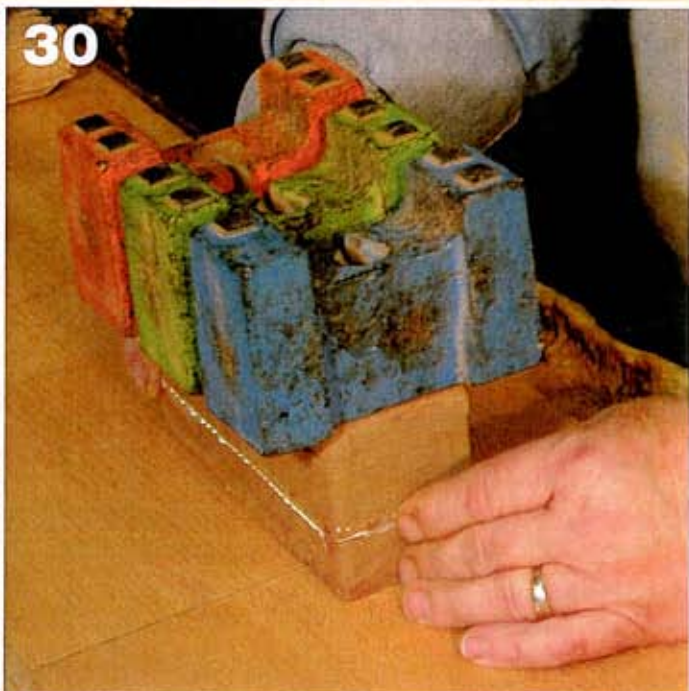
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STEPS 27-28 Fit the bottom on the box, and add spring clamps to hold the bottom in place.

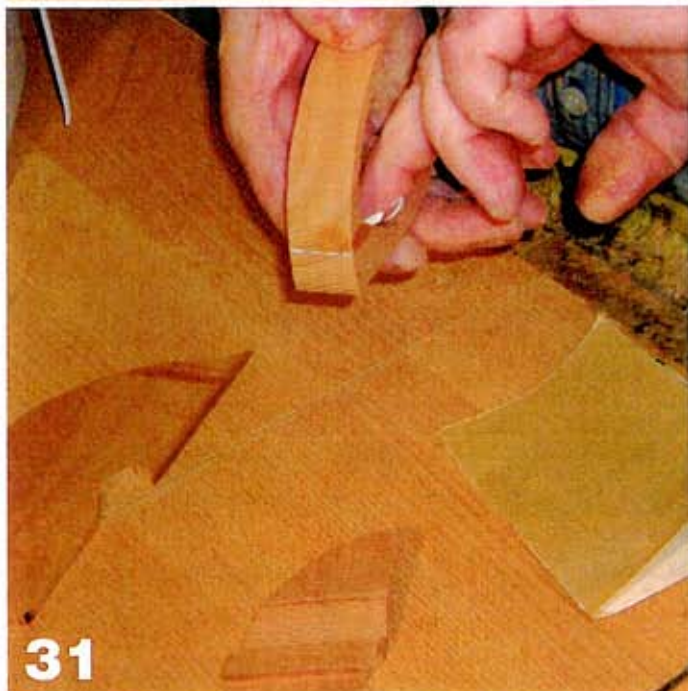
STEPS 29-30 When the glue has set up, sand the top of the bottom section and the bottom of the top section of the box until the saw lines are gone (see arrows in step 29). Apply glue, position them together, line them up perfectly and add weights. Make sure no glue squeezes out into the cavity that the drawer will slide into. It will be very difficult to remove any glue squeeze out once the box is assembled.



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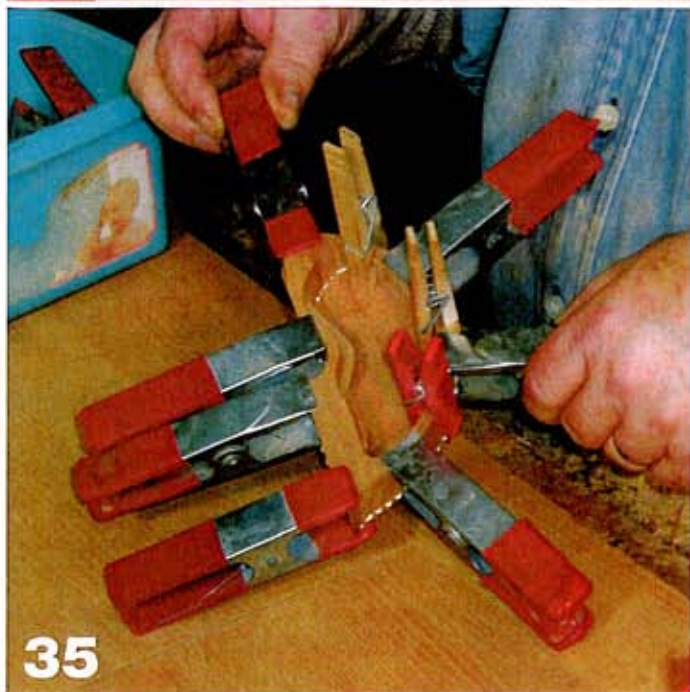
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STEPS 31-32 Glue the drawer seam, again adding spring clamps to hold the joint closed.

STEPS 33-34 Glue the bottom on the drawer. Then, double check the placement of the shoulders in the drawer by inserting the lid into the drawer, making sure it seats properly. Glue the shoulders in place.





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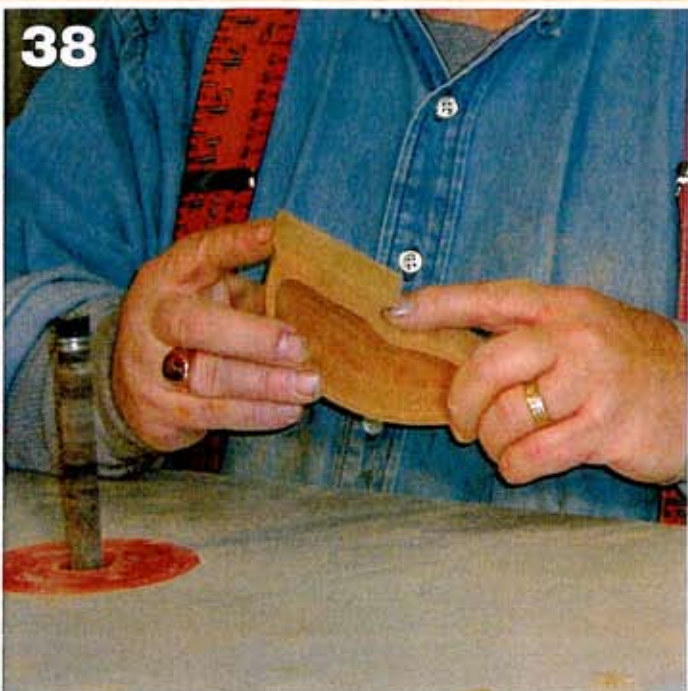
STEPS 35-36 Hold the shoulders in place using clothes pins.

STEP 37 Inside the top section of the box, glue the framework for the drawer-release key and the shoulders in place.

STEPS 38-39 Sand the box seams using a stationary belt sander. Sand the rounded edges (that I'm pointing to with my fingers) of the drawer using a spindle sander. Fit the drawer to its opening in the box. If needed, sand lightly on the bottom of the drawer so it will slide smoothly into the box. Don't change the contour of the drawer bottom where it meets the outside of the box. You want the drawer to be as "invisible" as possible.



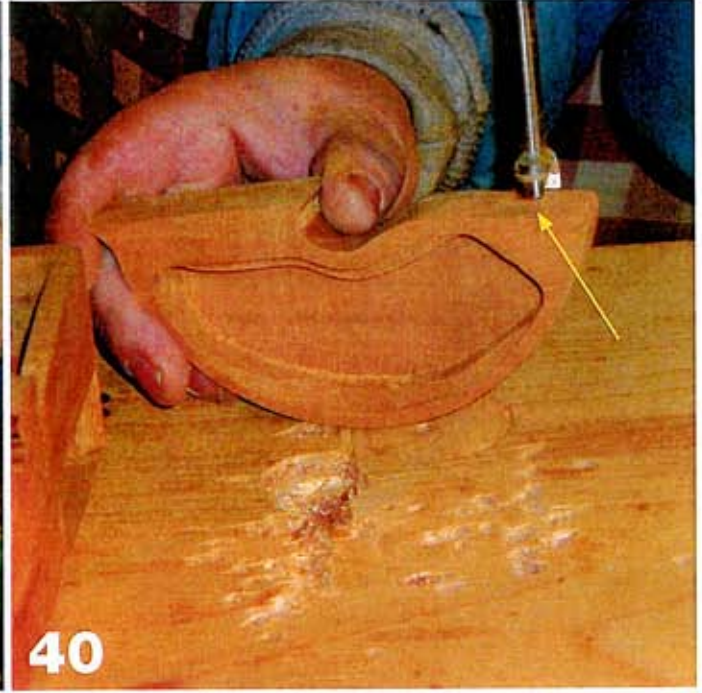
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STEPS 40-42 In the back of the drawer, where the wood was left thick, drill a $\frac{1}{2}$ " hole about $\frac{3}{8}$ " deep for the spring. (You can find the spring [mine is a #186] or a similar one at your local hardware store.) Temporarily insert the spring into the hole.



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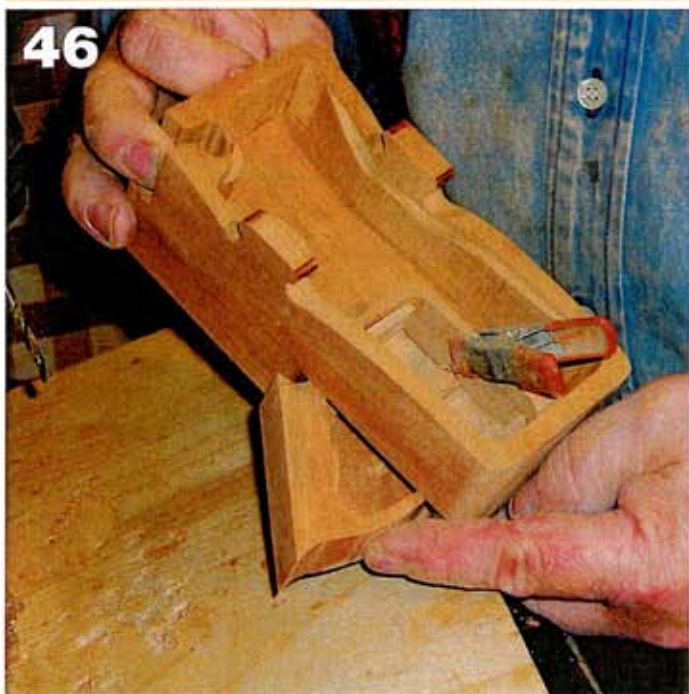


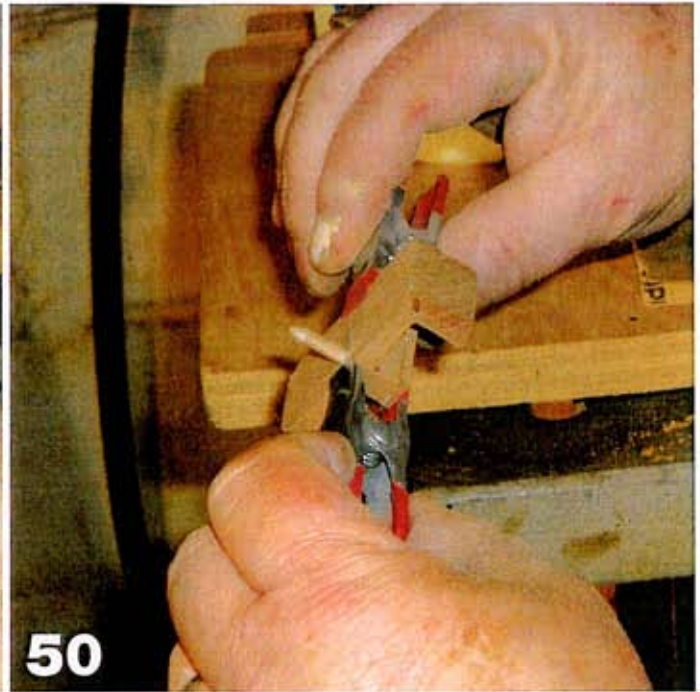
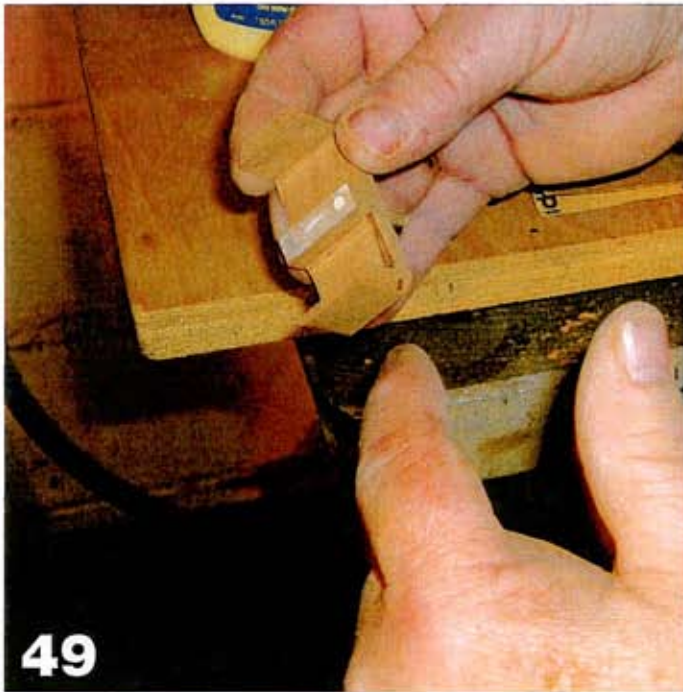
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STEPS 43-45 Back to the divider key cut in Step 8. Cut a thin sliver off the top of the middle, vertical leg of the divider. This sliver is thin, but save it.

STEPS 46-48 Insert the divider key into its framework. Insert the drawer (with the spring) into the box. While holding the drawer closed as tightly as possible (photo 47), drill a $\frac{1}{8}$ " hole through the divider, the bottom of the upper section and into the drawer in the bottom section. *Don't drill through the bottom of the drawer!*





STEPS 49-51 Cut a $\frac{1}{8}$ " dowel about 1" long and sand one end to a point. Put glue into the hole and on the top of the center finger of the divider. Insert the flat end of the dowel into the hole from the bottom of the divider, add the sliver of wood from Step 43 and clamp it in place.

STEP 52 With the spring in the drawer, insert the drawer into the box and push the pin and divider into place, which will lock the drawer in place. The drawer front will probably be recessed a little from the face of the box. Sand the box's face until it is flush with the drawer's face. Put the lid on the box and sand the box until all the parts are flush. Do any touchup sanding and finish the box. Then, glue the coil spring into place using a little dab of hot glue.

