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Turning a Lidded Box



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Turning a Lidded Box

This Simple Faceplate Technique Will Get You Turning Quickly

by Bob Colpetzer



You can make any of these variations using the techniques described by the author.

There's no shortage of innovative and finely engineered lathe chucks available for faceplate turning today. In fact, if you're a beginner or novice turner, you've probably noticed that there isn't much information on turning that doesn't praise or encourage the use of some type of four-jaw chuck system.

No question, these chucks do an excellent job and can grip stock in a wide variety of ways. If you're a serious turner, the

convenience, versatility, and speed that these chucks offer more than make up for their cost. But if you're just getting started or if you only turn occasionally, you may have a hard time justifying a lay-out of \$170 to \$300.

If you find yourself in this latter category, don't despair. Turners produced beautiful and interesting bowls, boxes, and hollow vessels long before these chucks were invented. In this article, we'll turn

one of the three attractive boxes with matching lids shown above.

To help ensure your success, I've kept the procedures, design, and tools simple. The project requires only a bit of proficiency with the scraping technique to hollow and shape the profiles. If you own a lathe and a basic set of turning tools, you've got all you need to get started. I hope you'll follow along and give it a whirl.

First, Prepare Your Turning Blanks

To match the grain and color of a box perfectly with its lid, I generally recommend starting with a 3x6x6" turning blank. But, turning blanks don't come cheap. If this is your first turning attempt, you may want to go the less costly route and laminate your own blanks from hardwood cut-offs gleaned from your scrap box.

For example, three pieces of 3/4"-thick stock cut from the same piece and glued face-to-face make a 2 1/4"-thick blank. A fourth piece can serve as the lid. This approach doesn't produce a perfectly matched box and lid, but color and grain will probably be close, and it's an affordable way to gain experience before you chuck up costly turning blanks.

To prepare a 3"-thick turning blank, mark a large X on the top and bottom, then resaw a 5/8"-thick slab from it for the lid (*figure 1*).

Make three backing blocks. I usually make mine from 3/4"-thick scraps of pine or poplar cut to the same size as the turning blanks (6x6"). Next, adhere the turning blanks to two of the backing blocks using the paper-joint technique described in the Pro Tip on *page 56*. Set the third backing block aside—you'll use it later as a wooden chuck.

To attach these assemblies to the faceplates, first draw diagonal lines on the backing blocks to locate their

centerpoints. Next, using a compass, scribe circles at least 1/2" larger than the finished diameter of the box. For the 5"-diameter box (profile 1) shown on *page 57*, I drew a 5 7/8"-diameter (2 5/16"-radius) circle.

Center 3"-diameter faceplates on the backing blocks. Next, drill 5/64" pilot holes, and drive #12x3/4" flathead wood screws to secure the backing blocks to the faceplates. I drill the pilot holes large enough to ensure that the screws won't crack or weaken the backing blocks. Now, bandsaw the box and lid blanks to remove the excess material (*photo A*), following the circles you scribed on the backing blocks earlier.

Next, Mount the Box Blank and Lay It Out

Attach the faceplate with the box blank to your lathe. Position the tool rest so that when you place the roundnose scraping tool on the rest, it will cut on center. Now (and after every setup change), turn the lathe by hand to make sure that everything clears the tool rest.

Next, you need to round down the blank by cutting away any off-centered stock. To do this, first select a lathe speed of about 500 rpm, then use a roundnose scraper to true up the blank (*photo B*). (For more information on turning tools, see "Tools You'll Need," *page 63*.) Once you've balanced the blank, increase the lathe's speed (1,200 to 1,500 rpm). Using the same tool, reduce the

blank's diameter until it measures 1/8" larger than the desired finish diameter of the box at its widest point. I measure this diameter, and others later, with a pair of outside calipers. (See the Pro Tip on *page 58*.)

We now want to reduce the diameter of the backing block to less than that of the turned box. This will allow you to turn the box's entire outside contour without inter-

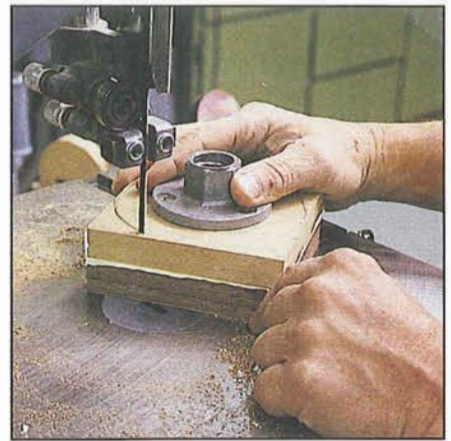


Photo A
Bandsaw both turning blanks/backing blocks round. Note: We've raised the blade guide to better show the process.



Photo B
With a roundnose scraper, round down the blank before you form the box contour.

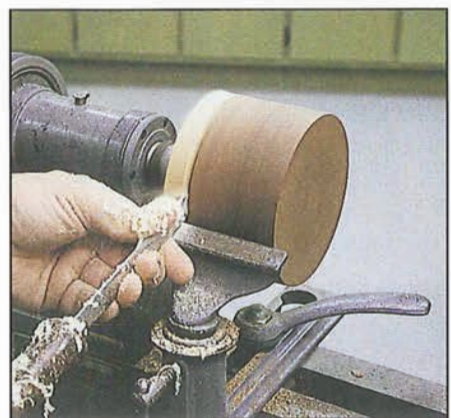
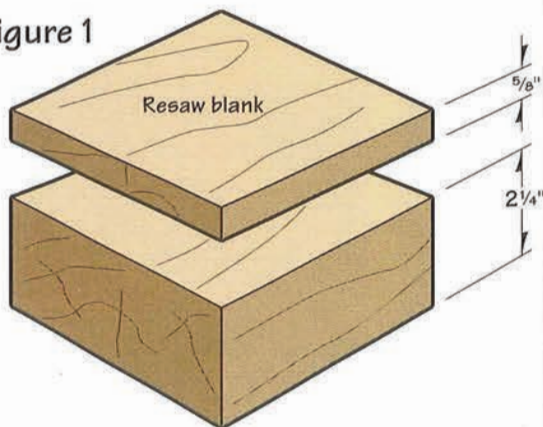


Photo C
Using a parting tool at the paper joint, cut into the backing block to start reducing its diameter.

ruption. Just grab a parting tool and part down into the backing block (next to the paper joint) to a depth equal to the diameter of the faceplate (*photo C*). To reach that required depth, widen the parting cut at the perimeter to give the tool operating room. When you've reached correct

Figure 1



Resaw to form stock for box and lid

PRO TIP

Paper joints are simple, they hold well, and they allow you to separate the parts easily from the backing blocks when finished.

First, cut pieces of paper (lined notebook paper or typing paper works fine) slightly larger than the blanks. Next, spread glue (either

white or yellow) uniformly on one face of each backing block and on the X-marked faces of each blank. Place a piece of paper on the glued face of each blank, place a backing block on top of the paper, align the edges, and then clamp. Let the glue dry overnight.



To make a paper joint, glue a sheet of notebook or typing paper between the blank and backing block, and clamp until the glue dries.

depth, switch to a roundnose scraper and round down the rest of the backing block to that diameter (*photo D*).

Transfer the critical dimensions and diameters from the Box Profile shown (we're making profile 1) onto the blank (*photo E*). I use a rule and pencil or a pair of dividers. Also, scribe the inside and outside diameters on the blank top at this time. Note that I've switched to a longer tool rest for this and the following steps.

Increase the lathe speed (1,800 to 2,000 rpm), then, using your roundnose scraper, start shaping the outside box contour (*photo F*). Check the dimensions as you work, and stop when you've reduced the blank to $\frac{1}{16}$ " larger than the box's final dimension. (You'll turn the box to final dimensions with the cover attached later.)

Now, reposition the tool rest, and turn the inside of the box (*photo G*). I use a $\frac{1}{2}$ " roundnose scraper and the same lathe speed for this operation.

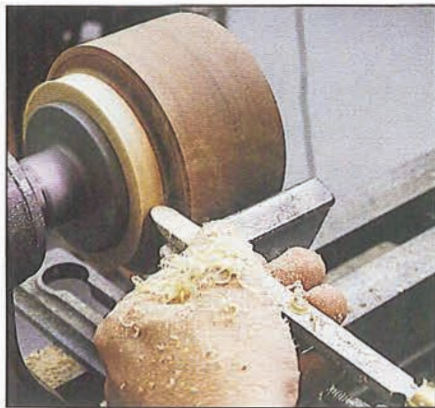


Photo D

Using a roundnose scraper, round down the backing block diameter to match the faceplate's diameter.



Photo E

With pencil and rule, lay out the box dimensions from the drawing onto the rounded box blank.

Work carefully, and stop the lathe frequently to check the box wall thickness and the depth. As you approach the finished depth and profile, take light cuts to smooth out the interior, using a freshly sharpened scraper resting firmly on the tool rest. Once you've finished, remove the faceplate from the lathe and set the turning aside for now.

Let's Turn the Lid Next

Mount the faceplate with the lid blank on your lathe. Next, round down the lid blank and reduce the backing block's diameter, using the same procedures you used on the box blank.

Next, lay out the inside diameter of the lid on the blank's face (exposed blank end). Then, use the parting tool to cut the groove to this diameter (*photo H*). Work carefully and check the diameter frequently by test-fitting the box on the lid. You have a proper fit when the box presses onto the lid but does not slip as you try to twist the two parts.

If you overshoot and cut the lid a bit too small, try wetting the edge of the lid and the inside lip of the box with a damp cloth. This may raise the grain enough to hold the two parts when you press-fit them together. If this doesn't work, try folding several small strips of 100- or 150-grit sandpaper over the box edge, and then press the two parts together. Cut away the exposed parts of the strips before you start turning. If the problem's still there, make a new lid.



Photo F

Using a roundnose scraper, shape the box contour to about $\frac{1}{16}$ " larger than the finished dimensions.



Photo G
Turn the inside of the box. Use a rule to check depth, a pair of calipers to check wall thickness.

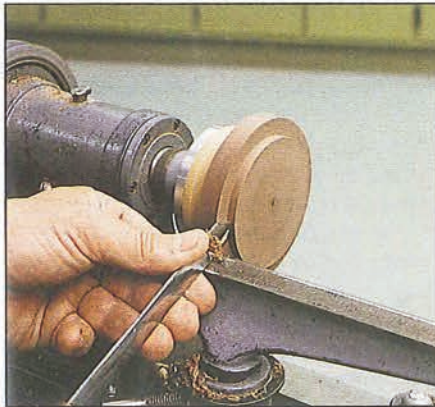
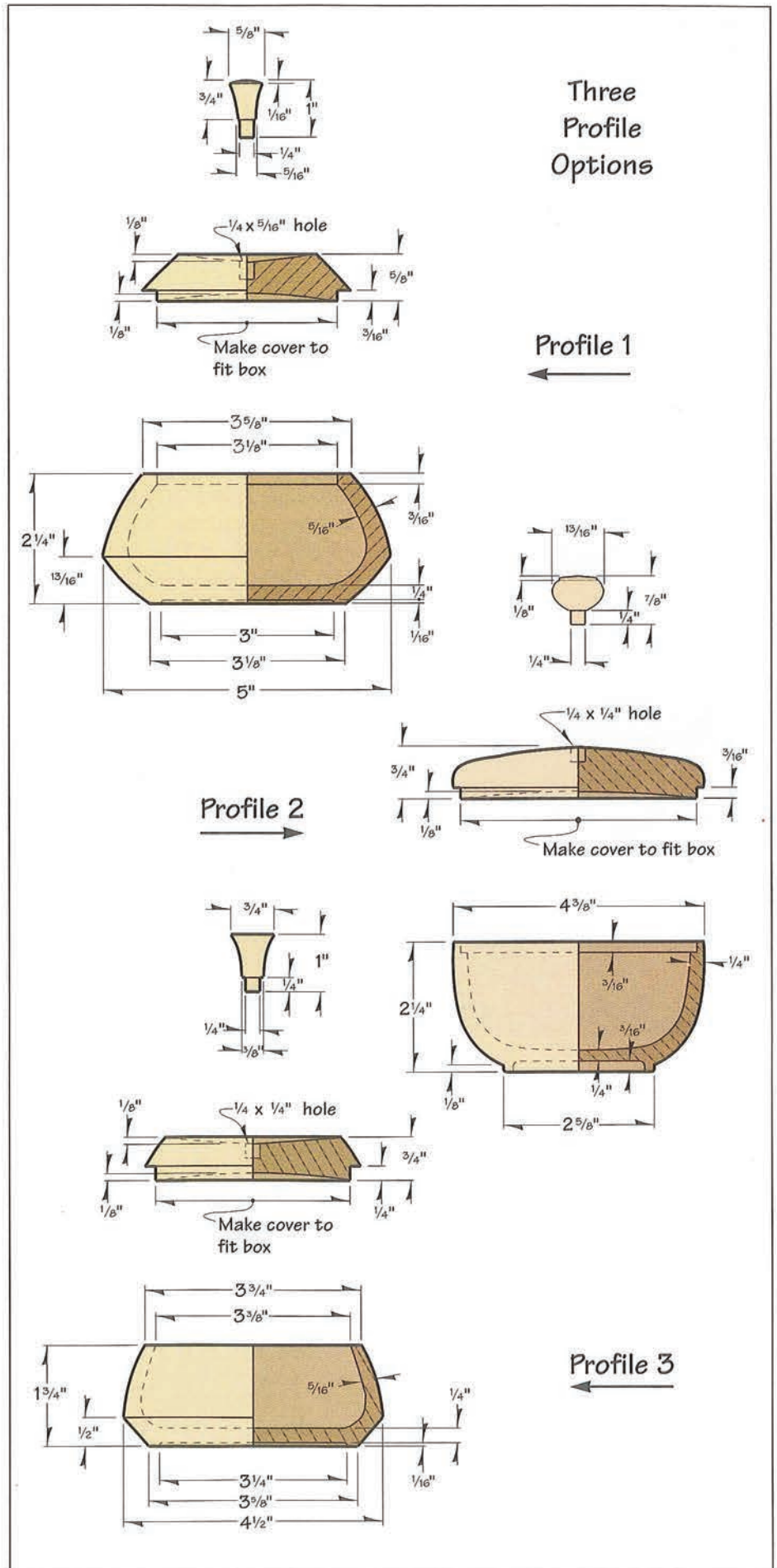


Photo H
Cut the groove on the box lid with a parting tool. Test-fit the parts frequently as you work—the box must press-fit onto the lid.



Photo I
Shape the inside of the lid. For best results, work the gouge from the center to the outside edge.

After you've achieved the desired lid and box fit, carefully pry the box off the lid. Next, using a $\frac{1}{2}$ " round-nose scraper, turn the inside lid contour (*photo D*). Sand the inside face of the lid, but do not sand the lip or shoulder—this will destroy the press-fit. When you've finished sanding,



press-fit the box onto the lid again, then remove both from the lathe.

Carefully separate the lid from the lid faceplate. To do this, I clamp the faceplate in my bench vise (*photo J*). Then, sitting on a bench stool with my lap supporting the box/lid assembly, and using a wide chisel and



Photo J
Holding the faceplate in the bench vise, separate the box from the backing block along the paper joint.

mallet, I chisel along the paper joint (paper glue line) between the lid and its backing block. Use light taps on the tool, and work completely around the paper glue line. If the paper joint hasn't separated by the time you've made one revolution, continue chiseling around it, using slightly firmer mallet strikes.

Turn the Box/Lid Assembly To Final Size

Mount the box/lid assembly on the lathe. Using a freshly sharpened roundnose scraper, turn the lid and box to their finished diameters and profile. I run the lathe at 1,800 to 2,000 rpm, taking very light cuts and working from the top of the lid towards the box. This keeps the tool from pulling the lid off the box.

Next, reposition the tool rest and shape the lid's top. As before, use a sharp scraper, take light cuts, and work the tool from the center to the outside edge (*photo K*). Then, finish-sand the box and lid exterior. (For additional sanding information, see the Pro Tip on *page 59*.) Now, drill a $\frac{1}{4}$ " hole $\frac{5}{16}$ " deep into the lid's center (*photo L*).

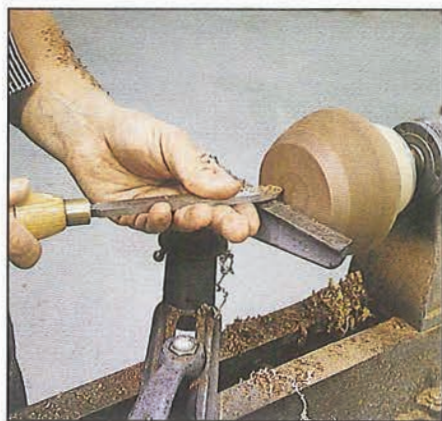


Photo K
After shaping the box and lid to final dimensions, move the tool rest, then turn the top of the lid.



Photo L
Mount a drill chuck on the lathe tailstock, and drill a $\frac{1}{4}$ " hole $\frac{5}{16}$ " deep into the lid for the knob's tenon.



Photo M
Mount a fresh backing block, then lay out the centerpoint and the box's inside diameter on it.

PRO TIP

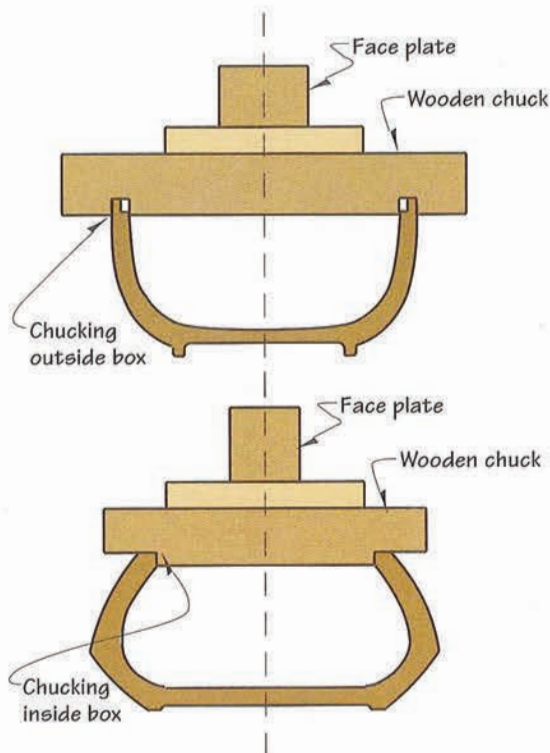
Use a pair of outside calipers to check the progress of your turning. To do this, first read the drawing to determine the diameter needed, then use a ruler to set the caliper to that diameter.

To measure the workpiece, stop the lathe and try to fit the calipers over it at the measurement point. If the calipers don't fit, turn it some more. For a correct fit, the caliper blades should gently rub the workpiece. Measure often as you get near the desired dimension. Remember, a given cut reduces the workpiece diameter by twice its depth.

Keys To Safe and Successful Turning

1. Prior to turning, remove loose-fitting clothing and all jewelry, and wear a covering to contain long hair.
2. Check the integrity of faceplates, backing blocks, and the turning blank before mounting them on the lathe.
3. Always turn the lathe over by hand to make certain all parts clear before starting the lathe.
4. Position the tool rest so it fully supports the turning tool at all times.
5. Wear face and dust protection. Everyday eyeglasses are not safety glasses.
6. Stop the lathe before making any adjustments or changes to the tool rest, headstock, or faceplate.
7. Assume a natural, comfortable stance with good footing and body balance. Remove any obstacles in your way before starting. Never reach or lean over a lathe while it's turning.
8. Keep your turning tools clean and sharp at all times.
9. Take light, uniform cuts for the smoothest finished surface.
10. Sand turnings at low speeds (500-600 rpm).

Figure 2 Shape of Box Determines Chucking



Now, carefully separate the lid from the box. Sand the box interior, then slightly enlarge the inside lip opening to allow the lid to fit freely. When finished, remove the box from the backing block using the same technique described earlier to separate the lid from its backing block.

Now You're Ready To Turn the Box Bottom

Mount your third backing block on a 3" faceplate, and round it down. Next, locate the centerpoint, and lay

out the inside diameter of the box on the block's face (*photo M*).

Move the tool rest to the side, and using the parting tool, cut to the inside diameter line (*photo N*). In this step, you are creating a lip onto which you'll press-fit the box. It must fit tightly over this lip and not turn, so test-fit the parts frequently as you work. If you're turning box profile 2, you need to prepare the wooden chuck as shown in the top example in *figure 2*.

To turn the bottom, first position the tool rest so the roundnose

PRO TIP

Contrary to what some people believe, sanding at a lower speed (500 to 600 rpm) gets the job done faster and with less sandpaper. High-speed sanding generates heat, dulls the abrasive particles faster, and glazes both the abrasive and wood fibers. If you generate enough heat to burn your fingers while holding the abrasive, you're running the lathe too fast. Keeping the paper moving helps too.

Depending on the kind of wood and the smoothness of the turned surface, I usually sand with a progression of garnet papers—80-, 120-, 180-, and 220-grit. Always wear a dust mask or respirator to minimize dust inhalation.

scraper will cut on center. Then, set your lathe speed at 1,200 to 1,500 rpm, and work slowly from the box center to the edge, taking light cuts (*photo O*). When you're satisfied with the bottom contour, slow the lathe, sand the bottom, then remove the box from the backing block.

Turn the Knob and Apply the Finish

To turn the knob, you need to make a jam chuck, but we'll use the faceplate and wooden chuck still mounted on the lathe from the last step for this. Bore a 1 1/8" hole 5/8" deep in the center. I use a multispur bit for this, but if you don't have one of the right size, use a bit close to that size, then turn the hole to final dimension.

Next, cut a 7/8x7/8x2" blank from the desired stock, and tap it into the

continued on page 63



Photo N
Using your parting tool, cut a lip into the backing block to accept the box.

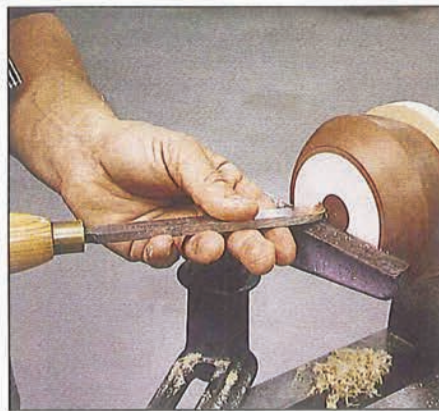


Photo O
Mount the box on the lip, then shape the box bottom, cutting from the center toward the outside edge.



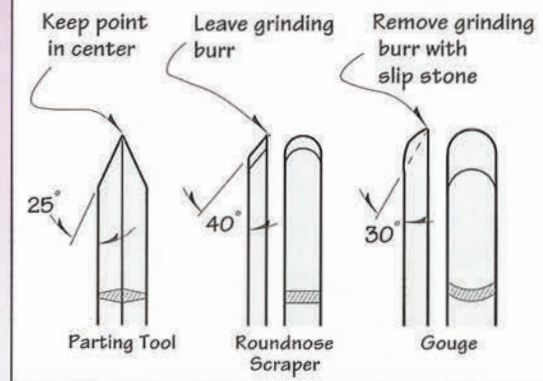
Photo P
To form the knob, bore a 1 1/8" hole into the backing block, insert the blank, then turn the knob to shape.

Tools You'll Need


To turn these lidded boxes, you'll need two 3"-diameter faceplates, a 1/2" roundnose scraper, a 1/8" parting tool, a 3/8" spindle gouge, and an outside caliper. An inside-reading caliper for measuring the workpiece wall thickness would be helpful but is not essential.

Turning tools work most efficiently when cutting edges are sharp and properly angled. Sharpen your tools to the angles shown in *figure 3*.

Figure 3 Tool Grinding Angles



hole you just drilled in the backing block. Round down the blank, then, using a spindle gouge and a parting tool, turn the knob to shape (*photo P*) as dimensioned on the drawing. Finally, finish-sand the knob, cut it from the blank, and glue it into the lid's hole.

Apply your choice of finish. I usually apply three coats of Watco Danish Oil finish to my boxes, letting each coat dry overnight and leveling it with a synthetic wool pad before applying the next. After the final coat has cured for five days, I'll apply wax and then buff it with a soft cotton cloth. 

Project design: Bob Colpetzer

Lead photograph: Studio Alex

Other photographs: By the author

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