

# wood turning

## Time-tested method for turning wooden boxes

BY RICHARD RAFFAN

Even after 35 years as a professional wood turner, I never tire of making lidded boxes, perhaps because the round, small containers still offer infinite design challenges.

I find inspiration for boxes everywhere I look, in natural and man-made things. This box is very architectural, a walled structure topped by a roof, or lid, with an overhanging lip and a cupola for a knobby handle. However, boxes can be almost any shape and size, from highly decorated to remarkably simple. The walls can be monumentally thick or ultrathin. And it is not mandatory that the internal form reflect

the exterior shape.

No matter what design I pursue, I always follow the same procedures to ensure that the

finished piece is visually balanced

and of high quality. I turn the box first, then refine the lid in relation to it. This project requires mounting the workpieces in a chuck several times, in several orientations.

I rely on a self-centering four-jaw chuck with dovetail jaws. The jaws fit into shallow grooves that I cut in the wood. The grooves allow me to pop the turning off and on the lathe as

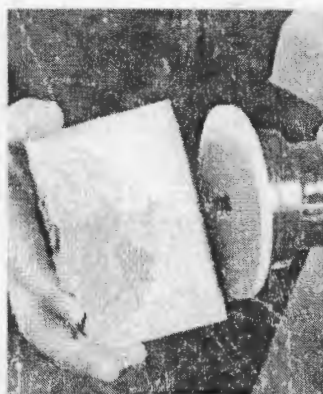


### Turn the bottom

Mount the blank for the box on a screw-center chuck. Turn the blank to a straight cylinder and then finish the base. Make a recess with angled sides for the four-jaw dovetail chuck to grip later. Finally, sand and apply a finish to the base surface only.



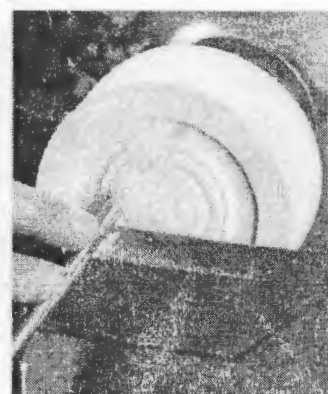
**1 Drill a center hole in the workpiece.** Use a drill bit of a slightly smaller diameter than the screw projecting from the chuck.



**2 Mount the turning blank on the lathe.** A plywood spacer prevents the center screw from driving too deep into the workpiece.



**3 Begin at the bottom.** After smoothing the blank into a cylinder, cut a  $\frac{3}{4}$ -in.-deep recess in the base. It not only looks nice, it gives the chuck a place to grip.



**4 Finish off the base.** Add a few details with a shallow gouge, then sand and finish.

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many times as necessary, and they also hide the minimal marks left by the serrated jaws.

## Start with the box

The lidded box is a faceplate project, with the grain at 90° to the lathe axis. I often cut a pair of blanks for the box and lid from the same 2-in.-thick seasoned block of wood.

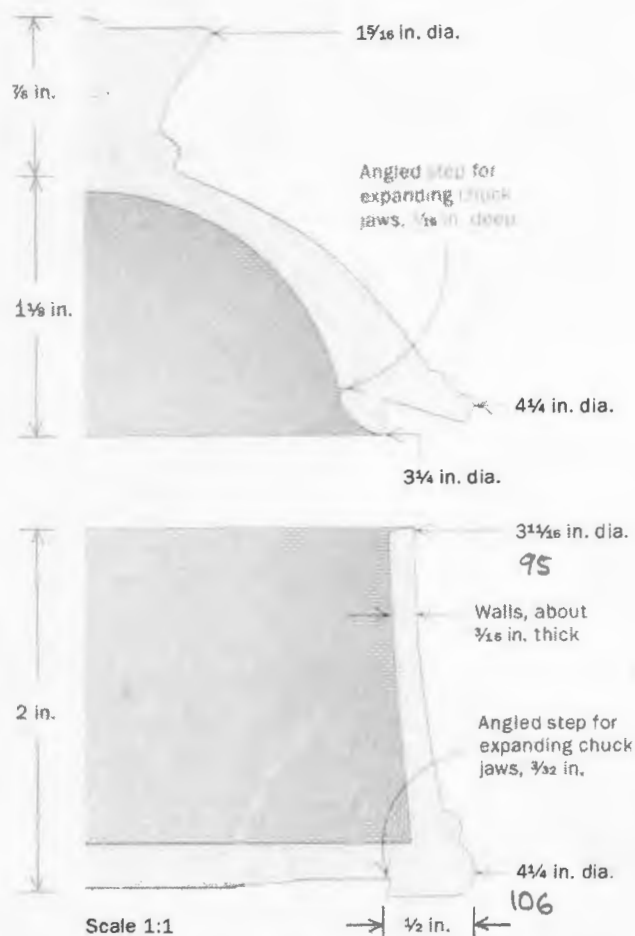
Mount the box on the lathe (see photos, p. 86), true the blank, and square the base to the side. Then turn the base to completion. It needs a foot around the perimeter and a slightly recessed center so that the final box will sit only on the foot. The best tool for cutting the recess is a small scraper with the face and left edge sharpened.

I like to add some decoration to the base. In this case, I rolled two beads with a shallow gouge (see photo, p. 86). Then I sanded the base and added a coat of finish.

Next, remove the center-screw chuck from the lathe and replace it with the four-jaw chuck. Mount the box on the chuck, and finish turning its profile. I prefer a  $\frac{3}{8}$ -in. shallow

## LIDDED-BOX CROSS SECTION

The box and the lid are the same diameter (and height), but the walls of the box taper inward, allowing the lid to overhang. The knob is decorative but also provides plenty of room to grip. The lid should be just undersize, compared to the box, so that it can spin freely and won't stick if the wood expands.



## Shape and hollow the box

Mount the box on the four-jaw chuck and tighten it by expanding the jaws inside the angled recess. Then turn the box to completion.



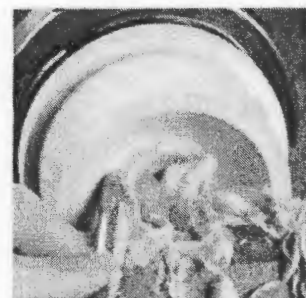
**1 Switch to a self-centering chuck.** Remove the box from the screw-center chuck, flip it over, and let the four-jaw chuck hold it.



**2 Drill a depth hole.** The center hole lets you know when you've hollowed the box to the correct depth. Leave the base at least  $\frac{1}{8}$  in. thick.



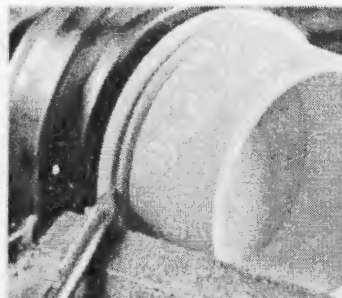
**3 Turn the outside.** Taper the walls to a smaller diameter at the rim so that the lid can hang over the box.



**4 Hollow the inside.** Remove most of the waste, cutting from rim to center with a gouge. Keep the walls a consistent thickness.



**5 Square off the inside corner.** A roundnose scraper with its edge sharpened to a corner will cut a sharp transition where base and wall meet.



**6 Roll two beads at the base.** These decorative elements will complement the overhanging lip on the lid.



**7 Sand and finish on the lathe.** Sand with up to P320-grit abrasives, then apply a coat of finish before removing the box from the lathe.

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gouge with a long fingernail grind for working the exterior and turning two beads on the outside, at the base. If you have a problem getting a clean cut on the end grain with the gouge, try shear scraping by holding a roundnose scraper at about 45° to the tool rest. A successful shear scrape will produce thin shavings, as opposed to the dust produced by a standard scraping cut.

With the profile completed, hollow the box (see photos, p. 88). Plan the depth of the box so that the base will be at least  $\frac{3}{8}$  in. thick, and then mark the depth by driving a  $\frac{1}{4}$ -in. drill bit into the center of the workpiece while the lathe is on. I attached a handle to one of my drill bits so that I can use it like a turning tool with the tool rest. But if you have a drill chuck for the tailstock, you can use that.

With the outside turned and the center hole drilled, hollow the inside using a  $\frac{3}{8}$ -in. deep-fluted bowl gouge, cutting from the rim to the center. When the interior is nearly finished, switch to a  $\frac{3}{4}$ -in. square-end scraper with a slight radius to make a nice, sharp corner where the wall meets the base. To

limit tearout on the end grain, which makes up nearly 75% of the wall, go very slowly as you make the final cut. If you can't cut cleanly with a scraper, use the  $\frac{3}{8}$ -in. shallow gouge with the bevel rubbing against the wall of the box and the flute pointing to the base. Finally, sand and finish the box, inside and out.

## Make the lid to fit loosely

Unlike the box, which is shaped and then hollowed, the lid is hollowed and then shaped. Use the self-centering chuck to hold the wood (see photos, below). On a turned box of this size, it's unwise to have a tight-fitting lid. Because of the direction of the grain, seasonal wood movement can cause the lid to expand and become jammed in the box. I make the lid so it's just loose enough to spin on the box. The overhanging lip on the lid also helps disguise any movement or distortion that does occur.

Remove the lid from the chuck as needed to see how it looks on the box and to gauge the thickness of the walls. When you're satisfied with the shape, sand and apply a finish. □

## Make the lid to fit

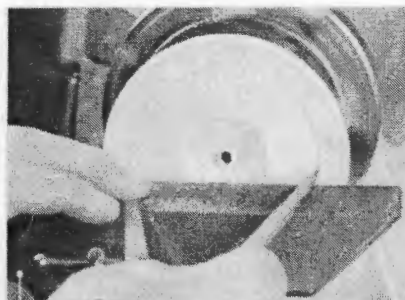
Mount a blank on the lathe with a center-screw chuck and rough out the outside so that it can be fitted to the four-jaw chuck. Then turn the underside of the lid, checking the fit of the lip with the finished box. Finally, remount the lid and turn the exterior.



**1 Mount the second blank on a center-screw chuck.** Turn a round tenon on the end and rough-cut the exterior profile.



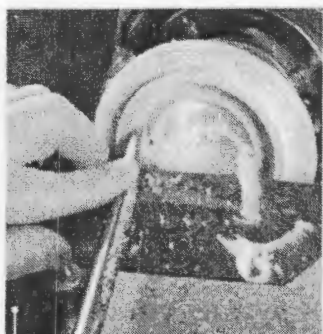
**2 Measure the box opening with dividers.** Transfer the inner diameter of the box to the lid, which is flipped and remounted.



**3 Use the dividers to scribe the diameter.** Dig the left point of the dividers into the work as it is spinning, then see if the right point lines up with the scribed line.



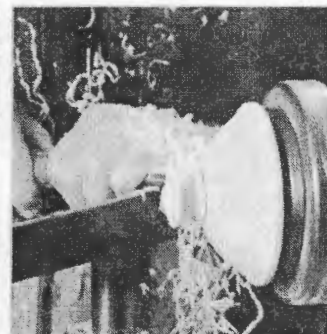
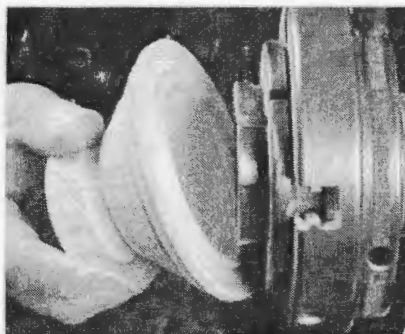
**4 Turn the lip to the scribed line.** Check the fit as you work. The lid should fit loosely because the wood will shrink and expand.



**5 Hollow the top.** With the lip sized, use a gouge to hollow out the inside of the lid.



**6 Cut a step for the chuck jaws.** Similar to the base, cut an angled step on the inside of the lip for the expanding chuck jaws to grab before removing the lid and remounting it. Apply a finish to the inside surface.



**7 Complete the top.** Trim the lid and finish off the knob. Then sand and finish.