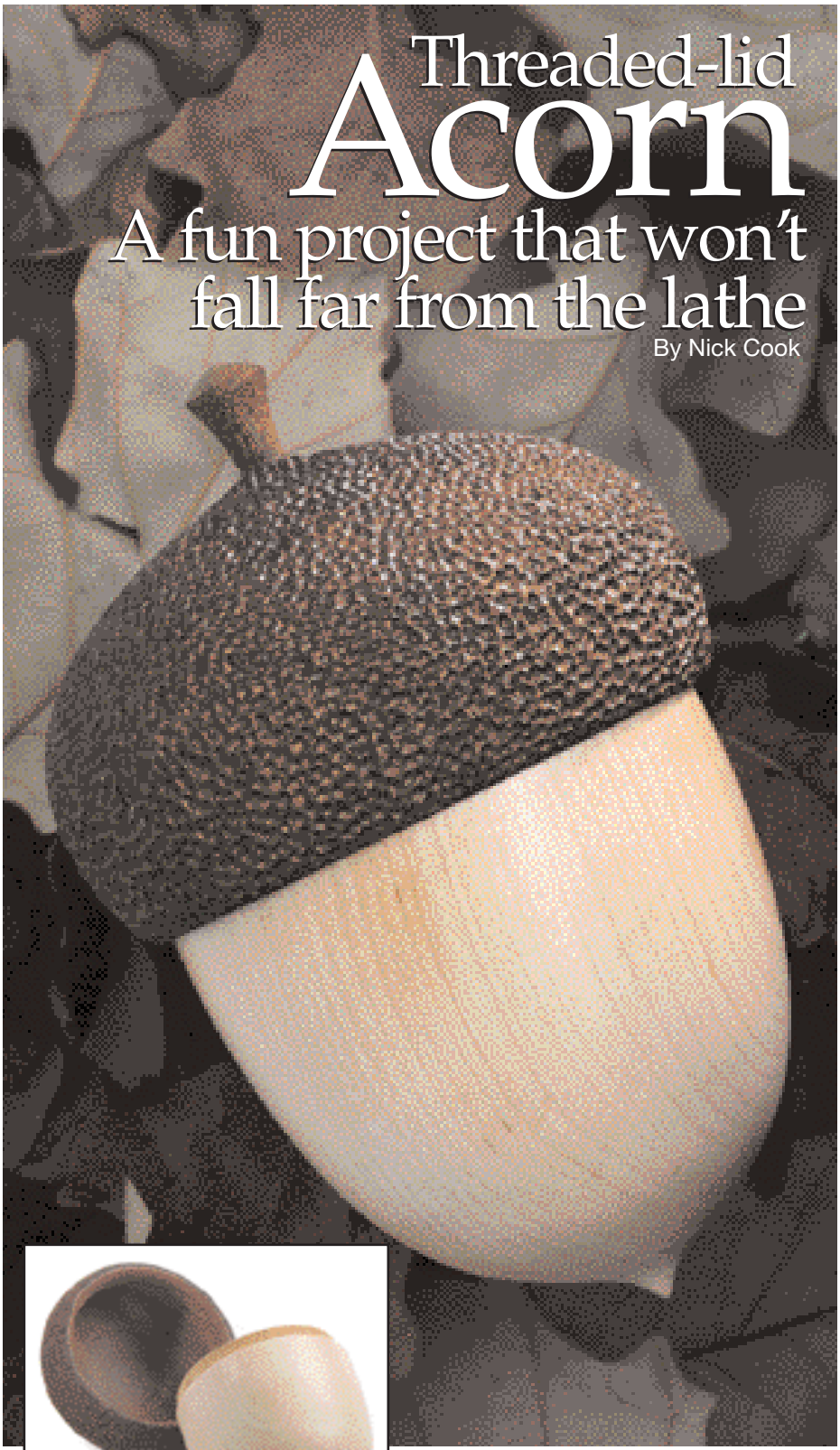
Threaded-lid Acorn

A fun project that won't fall far from the lathe

By Nick Cook



Above: Rich texturing to a 5 3/4" x 3 1/2" acorn box enhances the appeal of the Willard Baxter acorn shown above. Left: The 3" x 1 3/4" acorn featured in this project

Lidded boxes have always intrigued woodturners and the individuals who receive them. I have made boxes for more than 20 years—I have even threaded a few of them.

I actually watched Bill Jones and Allan Batty chase threads by hand and then— silly me—I purchased a set of thread chasers. Boy, that was a mistake!

I learned that chasing threads not only takes a lot of practice, but requires a great deal of patience as well. I did make the chasers work, but it is not something that I could do for a career.

I've had more success with a threading jig. If you follow these directions, you can learn to create threaded boxes and threaded inserts for vessels in short order.

This acorn box is a project that the late Willard Baxter taught me. The one described will finish at about 2 1/2" x 1 3/4". Willard made them as small as 1/2" diameter and as large as 3 1/2" diameter.

Tools and turning stock

In addition to a lathe, you'll need a threading jig. Two popular models on the market are the Klein Threading Jig (bonnieklein.com) and the Baxter Thread Master (bestwoodtools.com). When you order a threading jig, be sure to specify your lathe make and model (important information).

Threading jigs are normally set up to cut 16 threads per inch (tpi). That is what I have and the following directions are based on 16 tpi but, you can also order

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additional threading blocks for 8, 10, 12, 14, 20 and 24 tpi. The blocks are interchangeable.

You'll also need calipers. I have digital calipers (retail price about $30), which saves me a lot of time and provides the speed and accuracy I appreciate.

For tools, I use a 3/8" spindle gouge, 1 1/4" roughing gouge, offset scraper, and 3/8" bedan.

I chose hard maple and walnut for this acorn box, but most any combination of contrasting hardwoods will work. Your blanks should measure about 2"x 2"x 3" with the grain running with the axis of the lathe. I use 2"-diameter faceplates (supplied with the threading jig) and #6 x 3/4" screws to attach the waste block.

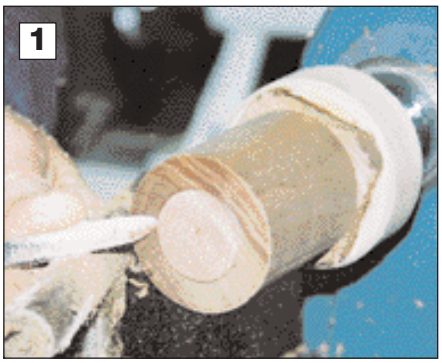
Prepare the acorn lid

Attach a 3/4"-thick poplar waste block to the 2" faceplate. Mount the faceplate to the lathe and face off the waste block with a 3/8" spindle gouge. With cyanoacrylate (CA) glue, mount the 2"x2"x3" walnut blank to the block.

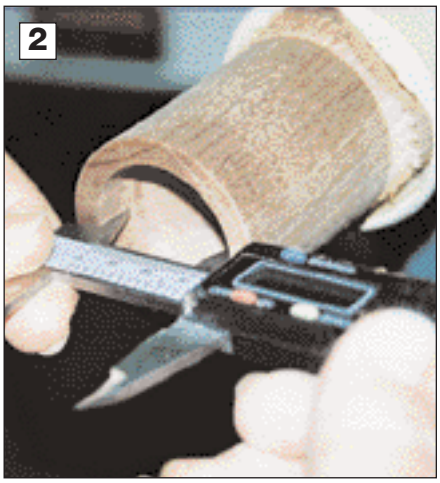
After the CA glue has set, turn the blank to a cylinder with a 1 1/4" roughing gouge. After you face off the end of the walnut (Photo 1), hollow out the walnut blank with a 3/8" spindle gouge.

For the threading steps, it is critical to maintain parallel sides while hollowing the blank. Check your progress frequently with calipers (Photo 2). I prefer to completely turn the interior, but you can drill out the first 3/8" of the lid with a Forstner bit.

Next, add a slight bevel to the inside edge of the hollow. This

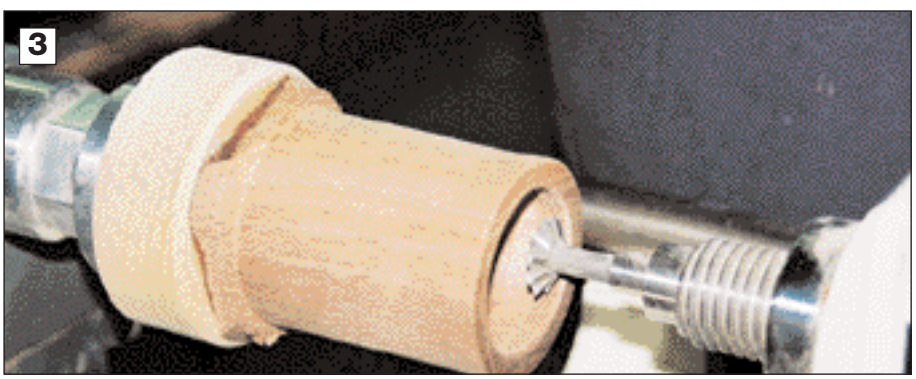


With a 3/8" spindle gouge, face off the end of the acorn lid.



With vernier calipers, check that the box sides are straight and parallel.

Photos: Cathy Wike-Cook



For the female threads, first check that the cutter just barely makes contact with the lid interior.

After cutting the female threads, shape the exterior of the acorn cap.

Acorns come in all

After you've turned and threaded a half dozen boxes (or acorns like the ones shown on these pages), expand your horizons.

Willard Baxter's 1/2"-diameter earrings *below* are great conversation pieces. See if you can accomplish the same results.

allows the thread-cutting bit to start cleanly into the hollowed walnut top. With an offset scraper, cut a small relief behind where you will cut the threads. This will allow the cutter to run off the end on the lid interior.

Set up the threader

Remove the lathe tailstock and mount the threading block. Also remove the faceplate so you can place the collet in the spindle for holding the thread cutter. Then, insert the drawbar and pull the collet and cutter snugly into the spindle. Once tightened, turn on the lathe to make sure the cutter runs true. I set the lathe speed at 2,630 rpm to ensure chatter-free cuts. Turn off the threader.

Cut the internal threads

Mount the faceplate with the walnut top onto the threading block and tighten. To reduce chipping, I apply a little paste wax on the threading area. (I have tried CA glue, but it tends to dull the cutter.) Move the lateral adjusting knob of the threading block out from the block approximately 1/2". Then move the threading block up to the thread cutter and adjust to a position where the cutter is just inside the walnut block. Lock down the cutter to the lathe bed.

Using the in/out adjustment knob, move the wood block to where the cutter just makes contact with the lid (Photo 3). Rotate the block by hand to make sure you have the same contact all around and then back off just enough for the cutter to clear.

Now, back the wood block away from the cutter until you have about 1/4" clearance. Make a note of where the adjustment knob is set on the index scale; this will give you a reference in case you need to make adjustments later.

Using the threader in/out adjustment knob, move the block toward the cutter .035". (Each mark on the dial gauge is .001".) Turn on the lathe and rotate the lateral adjusting knob of the threading block clockwise to bring the walnut in contact with the cutter. Slowly and smoothly turn the knob until it has three to four threads on the walnut.

Stop the lathe and slowly back the wood block from the cutter by turning the lateral adjusting knob counter clockwise. Clean the chips from the threads with a small, soft wire brush.

Now, rough-shape the exterior of the acorn cap (Photo 4).

Using a digital vernier caliper, measure the inside diameter of the threads of the walnut acorn top.

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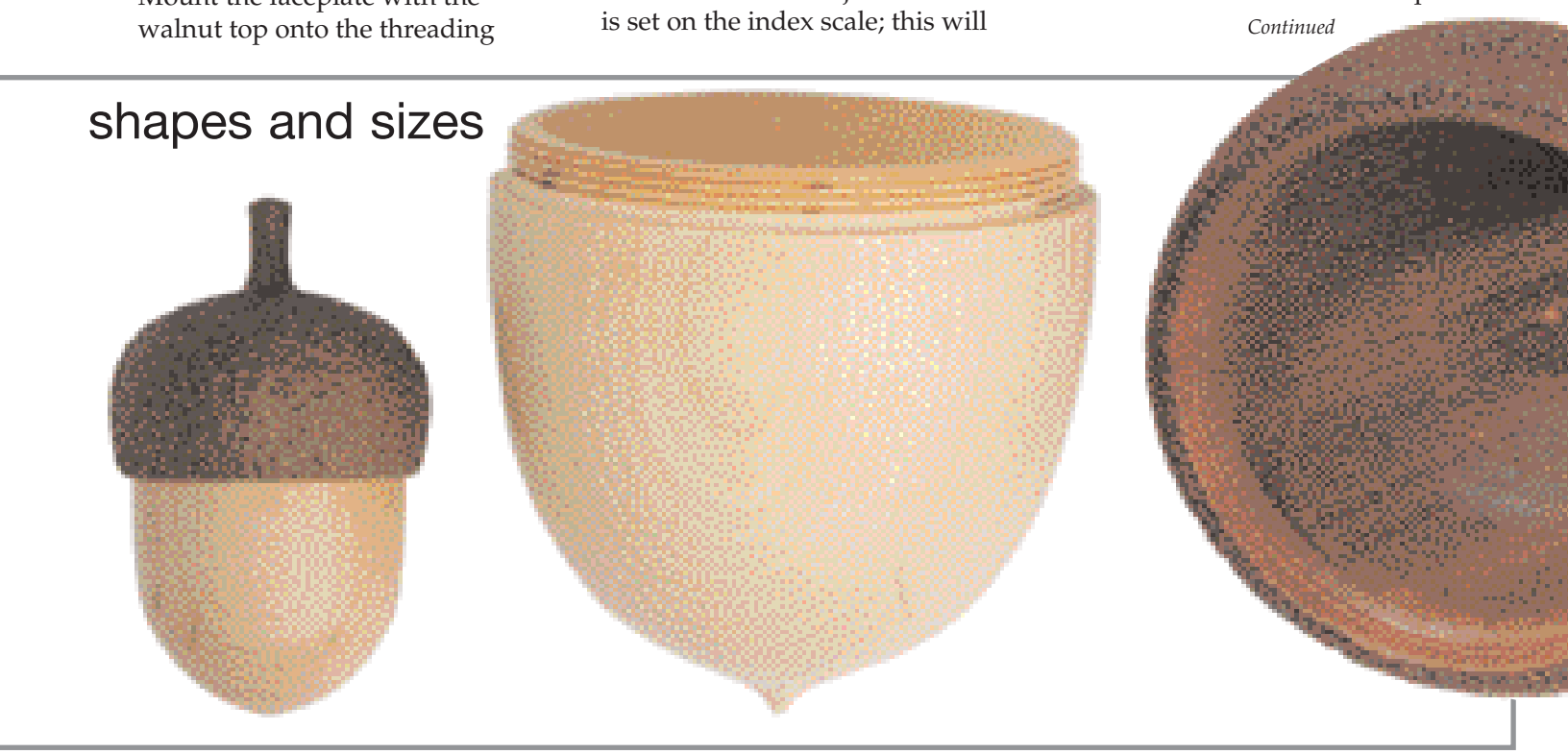


Then add .070"; the result will be the outside diameter of the tenon you'll thread later.

Prepare the maple base

Remove the threading assembly from the lathe and mount another faceplate with a poplar waste block attached. Face off the waste block and adhere a 2"x 2"x 3" block of hard maple with CA glue. Turn the maple to a cylinder and true up the end.

Once true, cut a shoulder or tenon on the end of the maple block with a 3/8" bedan tool. The tenon should be approximately 1/4" long. It is critical that the tenon sides be square and parallel.

With a 1/16" parting tool, cut a 1/16" wide by 1/16" deep relief on the back end of the tenon (Photo 5). Then chamfer the end of the tenon. (I usually forget this step until I get ready to thread.)

Cut the male threads

Remove the faceplate from the lathe and remount the collet and thread cutter in the spindle. Secure it with the drawbar and turn on the lathe to make sure the cutter runs true. Turn off the machine.

Screw the faceplate with the maple blank onto the threading block. With the lateral adjustment extended approximately 1/4", slide the threading block toward the threading cutter.

Position the threading block to where the cutter is about midway on the tenon at the back side of the block. Lock the threading block to the lathe bed (Photo 6).

Using the in/out adjustment, bring the tenon to where it just barely touches the cutter. Now use the lateral adjusting knob to pull the maple block back from the cutter. There should be approximately 1/4" clearance between the cutter and the end of the maple block. Once clear, rotate the in/out adjustment knob clockwise to bring the block .35" closer to the cutter (this will set the depth of the threads). Apply a small amount of paste wax to the tenon.

Turn on the lathe and rotate the lateral adjusting knob clockwise to move the block toward the thread cutter. Continue to turn the knob slowly and smoothly to cut 3 to 4 threads on the tenon. Stop the machine and carefully back the maple block away from the cutter. Clean the threads with a wire brush and test the fit. Make any adjustments necessary to ensure a snug fit to the shoulder. Once satisfied with the fit, remove the faceplate from the threader and remove the threading assembly from the lathe.

Complete the acorn

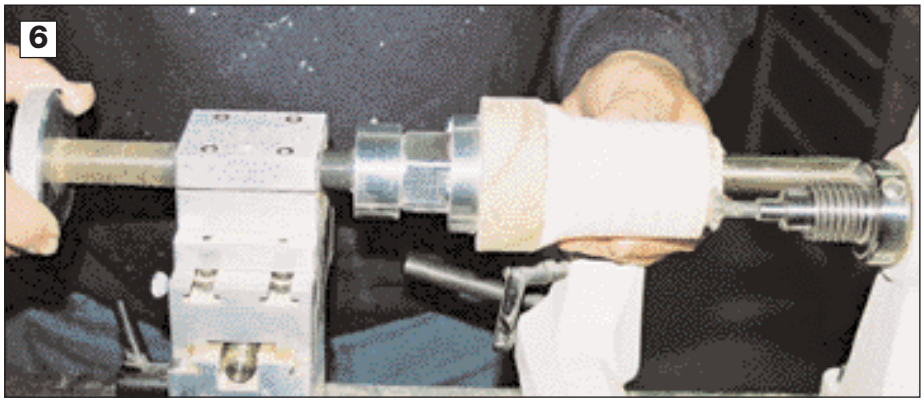
After the threads are cut and you've fitted the lid and cap together properly, it's time to finish turning the acorn exterior. First, remount the walnut box top. Sand and finish the interior of the top before completing the exterior.

The only finish I apply is wax. For these boxes, I don't use penetrating or film-forming finishes.

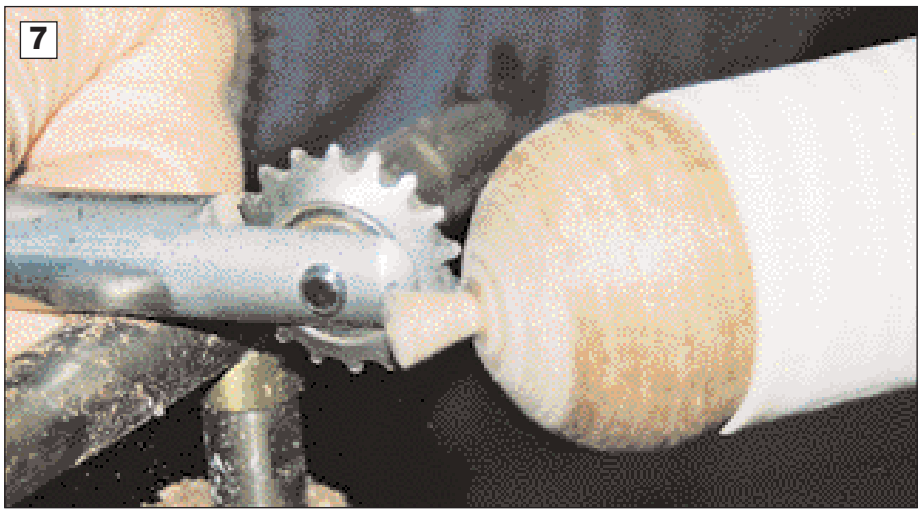
Now, shape the top and leave enough material for a stem. Part off the top. Remove the faceplate and waste block and remount the second faceplate with the maple block attached. Screw the walnut top onto the maple block and finish turning the top and stem. You may texture the acorn lid at this time (Photo 7). Sand and finish with wax.

Remove the walnut top. Hollow the maple base of the acorn using

With a 1/16" parting tool, turn the 1/16" relief on back end of the tenon.



After adjusting for the thread depth, cut male threads into the maple base. The tenon for the bases is .070" larger than the inside diameter of female threads.



With a texturing tool, add detail to the acorn cap.

Hollow the maple base with a 3/8" spindle gouge.

either a 3/8" spindle gouge or your favorite tool suited for end-grain hollowing (Photo 8). Sand and finish the interior with wax.

Shape the exterior of the base to within about 1/4" of cutting off the waste block (Photo 9). Then sand, finish, and part off the base from the waste block.

Jam chuck for final steps

Next, make a jam chuck from the waste stock to fit the interior diameter of the maple base. (I use a 3/8" bedan tool for this step.)

Don't rush this step; I have cracked more than one base while trying to force it onto a jam chuck. Fit the base onto the jam chuck (Photo 10) and finish turning the exterior. Sand and finish with wax.

If you would like, add more texture to the walnut top. Willard textured his boxes with a small ball-end cutter mounted in a rotary carving tool. I've had good results with spiraling and texturing tools.

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Shape the exterior of the maple base.

With a jam chuck turned from scrap material, mount the base, then turn the bottom of the acorn.