Turn a BIRDCAGE AWL

Mike Peace

Here is an easy and fun project suitable for beginning turners as well as anyone who needs an awl. Awls make a great gift for anyone with a toolbox! Why are they useful? Woodworkers use scratch awls for scribing lines and making starting holes for screws or drill bits. Leather workers use awls for punching holes in leather for stitching. As a woodturner, I use an awl to mark the center of a spindle-turning blank, and I use a small dedicated awl to hold my bowl templates in place instead of a nail or screw *(Photo 1)*. And, with a longer shaft and a longer, straight handle, you have an ice pick instead.

Design

See what fits your hand best for the awl's intended use. If you are a relatively new turner, I would suggest using some branch or scrap wood and experiment with the handle design by practice-turning some shapes. This will reduce your anxiety when turning that expensive exotic or special scrap of spalted or figured wood you plan to use for the handle. I prefer a large round handle that fits in the palm of my hand for a general-purpose awl. I tend to make mine about 5¼" (13cm) long overall, with the handle about 2" (5cm) in diameter and 2½" (6cm) long and the metal shaft about 2¾" (7cm) long. Scratch awls and ice picks tend to be a bit longer than a general-purpose awl, maybe 7" (18cm) with a smaller-diameter handle.

Project wood

Almost any dry hardwood blank approximately 2" square and 4" (10cm) long will do, depending on your design preference. I have used cedar elm, cherry and maple laminated together, Osage orange, dogwood, mesquite, and pear, as well as a variety of exotics such as bocote, zapote, zebrawood, Yucatan rosewood, jatoba, and many more. Figured wood and wood with prominent grain look nice, but plainer woods like maple, dogwood, and pear lend themselves to embellishing with burn rings and texturing.

The shaft

You should use a piece of high-carbon steel for the awl shaft, as it is strong and hard; do not use an ordinary nail. If you plan to make only one awl, you could use an old drill bit by burying the fluted end into the handle, but it would need to be longer than an ordinary bit. However, making these is addictive, so I recommend buying some rods of music wire, also known as piano wire or spring steel. Music wire is made of high-carbon steel that is pulled through a die at room temperature to form a thin wire, then heat-tempered. The end product is a wire that can endure high amounts of tension and stress repeatedly without losing its strength or elasticity.

Music wire, often used for landing gear on radio-controlled model airplanes, is available from hobby shops, some hardware stores, and on the Internet (at sites like Amazon or eBay). I buy K&S Music Wire 5⁄32" (4mm) diameter by 36" (91cm) long. It typically comes in a pack of seven rods for about $18, including shipping. If you prefer a sturdier shaft, you can get 3⁄16"- (5mm-) diameter rod, also in 36" lengths.

For a general-purpose awl, I cut the shaft about 4" long. I place the wire in a vise and cut it using a rotary tool with a cutoff wheel, but you could also cut it with an angle grinder with a metal cutting wheel or a jigsaw with a metal cutting blade *(Photo 2)*. Cutting music wire with a hacksaw is a challenge—the wire's hardness tends to cause the blade to skate over the surface. You should be able to get at least eight shafts from one 36" rod. So for about 32 cents per shaft, music wire is very cost-effective. The low-carbon, cold-rolled steel you might find at the larger home-supply stores is just too soft to use for an edged tool.

A tool for awl reasons

1

An awl has many uses, such as holding sawing templates in place on bowl blanks. Be sure it is driven deeply enough not to come loose.

Cut the metal shaft

2

Cutting music wire is best done with a rotary tool with a cutoff wheel while holding the rod in a vise.

Prepare the handle blank

3

Mark the center of the blank, then mount it between centers.

4

Rough the blank to round, then use a parting tool to make a tenon for remounting in a chuck.

Turn the handle

The turning tools you will need for this project are a small spindle gouge, a spindle-roughing gouge, a parting tool, and perhaps a skew or point tool to cut V-grooves. Use a ruler to draw lines diagonally from corner to corner to identify the center. Use an awl to mark the center on each end where the lines cross *(Photo 3)*. (If you don't yet have an awl, a nail set or even a nail will do to punch a center hole.) Mount the blank between the drive and live center. Use your spindle-roughing gouge or skew to turn the handle blank round. Use a parting tool to turn a tenon on one end to fit your scroll chuck *(Photo 4)*.

Reverse-mount the blank in the chuck using the tenon you just cut. Now cut a new tenon on the tailstock end with your parting tool, this time as a surface to accept the ferrule. Use the ferrule you are going to use as a guide for marking the length. Add an extra 1⁄16" (1.6mm) so the tenon will just sit proud of the ferrule even after any sanding *(Photo 5)*. A ferrule prevents the handle from splitting and provides a smooth transition from the shaft to the handle. *(See Ferrules sidebar.)* Put a slight chamfer on the end of the tenon to make it easier to slide on the ferrule and for a refined final appearance.

Fit the ferrule to the handle tenon. "Sneak up" on sizing the tenon so you will have a snug fit. When you achieve a good fit, use epoxy to glue ▸

Ferrules

You can make your ferrule from a wide variety of materials, such as a piece of copper pipe, a brass shell casing, or a brass plumbing fitting like a 3⁄16" (4.8mm) flare or compression nut *(Photo a)*. I have also used the inner ball-bearing race from a worn-out bearing from my bandsaw *(Photo b)*.

If your brass fitting has exterior threads or flats you want to reduce or eliminate, you can easily file these off by hand with the work held on the lathe. Alternatively, you can use a sharp HSS scraper or parting tool to shape the brass *(Photo c)*.

Safety Note: Keep the lathe speed about 600 to 700 rpm and take light cuts. After final-shaping, progressively sand the ferrule up to 600 grit to remove the scratches. Be careful not to transfer the dark metallic oxides from the sandpaper onto the wood.

Options for making ferrules include copper pipe, brass shell casings, and brass plumbing fittings.

Even an inner bearing ring can be used as a ferrule. This one came off a bandsaw.

You can use a parting tool as a scraper to remove threads or flats from brass plumbing fixtures.

The blank takes shape

With the blank now mounted in a chuck, use a parting tool to shape the tenon for the ferrule.

Drill the hole for the metal shaft.

The handle after final shaping, with decorative burn rings added and the ferrule polished before parting off the lathe.

Reverse-mount the blank

Reverse-chuck the handle for finishing its bottom. The bead at the top of the ferrule acts as a bearing surface against the front face of the chuck jaws.

Dress it up

A knurling tool is one way to add a touch of embellishment. Note that this awl handle is held in a collet chuck, which is a good alternative to a four-jaw scroll chuck.

A variety of textured handles, framed with V-grooves or beads and embellished with metallic wax.

on the ferrule. I usually leave the blank mounted in the chuck and simply unscrew the chuck from the lathe for this operation. This will ensure the blank will run true when you put the chuck back on the lathe. After the glue has cured, you can finish shaping the handle. Moreover, you can shape and polish the ferrule as necessary.

Next, put a drill bit 1/64" (0.4mm) larger than the wire shaft size in a drill chuck. *(Tip: To center the drill bit in the chuck, insert and tighten it off the lathe.)* Now mount the drill chuck in the tailstock and with the lathe turning at about 1000 to 1500 rpm, drill the hole 1¼" (3cm) deep *(Photo 6)*. Clear the chips often and keep your left hand on the drill chuck when retracting. This will ensure you can shut off the lathe in time to prevent injury if you notice the drill chuck being pulled out of the tailstock. You will glue in the wire shaft later, after completing the handle and removing it from the lathe.

Shape the handle as you see fit with a spindle gouge. Remember, on a spindle project, cutting "downhill" from large diameter to smaller diameter yields the cleanest cut. Carefully shape the handle to the edge of the ferrule so there will be a smooth transition. A bead here is an attractive feature. It also helps with reverse-chucking, as we will see shortly. Finish sanding through the different grits up to about 320 for domestic woods. You may want to go up to 600 grit for exotics that do not take a finish but will polish nicely. When sanding, do not press too hard or turn too fast, or you can overheat the wood and get heat checks, especially with dense-grain exotics.

If you like, you can embellish the handle with beads, V-grooves, burn rings, or texturing. Sand the ferrule up to 600 grit to polish it, as well *(Photo 7)*. Do not reuse the sandpaper after sanding the ferrule or the black oxides from the metal can stain your wood.

Now part off the handle, or part down most of the way and make the last cut with a fine-toothed saw with the lathe off. I wrap a piece of tape around the ferrule and reverse-chuck the handle by clamping it on the inside of my chuck jaws with a bead snugly pressed up against the inside of the jaw faces *(Photo 8)*. With this chucking method, a bead or some other shoulder feature is needed to get a strong enough hold on the blank. This allows me to easily finish-sand the butt of the handle and add an optional textured feature with a texturing tool like a knurling tool, Sorby micro-spiraling tool, or even a chatter tool.

Use a knurling or spiraling tool at a speed no higher than 400 rpm. Start texturing about 3/32" (2.4mm) to the left of center. Notice that I was able to use a collet chuck as an alternative, secure holding method *(Photo 9)*. A knurling tool with 16 tpi works better in very hard woods than 12 tpi. A non-woven abrasive pad like a green Scotch Brite pad is a great way to clean off any frizzies left by the texturing tool. I like to frame the textured area with a small bead or V-groove cut with a point tool or the tip of a skew on its side *(Photo 10)*. It is a good idea to practice your texturing technique on an endgrain scrap before using it on a ▸

Glue in the shaft

Clamp the shaft in the handle while the glue is curing.

Birdcage Awl Grind

The term *birdcage awl* refers to the tool's original use for boring various-sized holes in the construction of birdcages, back when woodworkers commonly made all types and sizes of birdcages for holding and transporting exotic birds and poultry. The birdcage awl is capable of producing a tapered, round hole in wood by actually shearing the wood fibers with its reaming action.

To make a birdcage awl, simply grind the point with a long, square pyramid shape from the point back 1" to 1¼" *(Photo a)*. The four sharp sides all act as cutting edges when you twist the awl into wood.

Close-up of a birdcage awl shows the micro-bevel pyramid tip and the clean, sharp edges. This awl grind is useful for quickly cutting a hole in wood.

Form and refine a point

12

Shape the awl tip with a belt sander, creating four flat facets with bevels of equal length.

13

If using a grinder to shape the tip, a jig made from scrap wood helps to hold and guide the shaft safely.

14

Use a hone for fine-tuning the tip after rough-shaping.

project. Adding a bit of metallic wax to the texturing as a final touch really makes it pop.

Make a steel shaft

As shown in *Photo 2,* cut the music wire for the shaft with a rotary tool equipped with a cut-off wheel. The length depends on your awl design. I prefer to cut mine 4" long, which allows me to bury the shaft in a 1¼"-deep hole, leaving a 2¾"-long exposed shaft. To ensure a good glue bond of the metal to wood, rough up the inch of metal that will be glued by rotating it while drawing it quickly along the edge of your grinder. Mix the epoxy with the end of the wire shaft that will go into the hole, and push it in or tap it in with a mallet. I use the five-minute set epoxy, but almost any variety will do. The glue will tend to push out the shaft while curing, so I clamp it to prevent that from happening *(Photo 11).*

Let the glue cure fully before sharpening. I use a felt-tip pen to mark 1" (25mm) to 1¼" at the tip. I find it easiest to use a belt sander for shaping the tapered point on the end of the shaft. I do this without a jig by grinding opposing sides and continually checking to ensure each side is flat and of equal length *(Photo 12).* You can also shape the tip on a grinding wheel, but if you do, I recommend using a scrap of wood with a hole in it to support the awl shaft on the grinding platform *(Photo 13).* Unless you are shaping a tip from a high-speed-steel (HSS) blank, be careful not to overheat the tip and ruin its temper. Grinding with a CBN (cubic boron nitride) wheel will generate less heat than an aluminum-oxide wheel, and the high-carbon music wire will not damage a CBN wheel. Whether using a belt sander or a grinder, use a light touch and quench the metal in water often to prevent bluing.

Because of the fragility of the tip, I use a sharpening stone or diamond or CBN hone to fine-tune it by adding a tiny micro-bevel at the very tip *(Photo 14).* Polish the shaft with sandpaper up to 600 grit. I prefer to use a "birdcage awl" grind with a four-sided taper. This grind is much better than the standard, round-tapered tip for creating starter screw holes. *(See Birdcage Awl Grind sidebar.)*

Finish

Use the finish of your choice on the handle. I typically use a couple of coats of Minwax Antique Oil, applying it off the lathe and letting it dry twenty-four hours between coats. An oil-and-beeswax finish is a good option, too. For exotic woods that do not take a finish very well, such as African blackwood or lignum vitae, you might just sand to finer grits to bring up a shine. I always put a wine cork on the tip as a safety measure if I am giving one away or storing it in a toolbox. ■

Mike Peace is active in three woodturning chapters in the Atlanta area. He is a frequent demonstrator and regularly uploads woodturning educational videos to his YouTube channel, Mike Peace Woodturning. Before retirement, Mike worked as a software project manager. After serving on active duty in the U.S. Army, he continued service in the reserves, retiring with the rank of Lieutenant Colonel. For more, visit mikepeacewoodturning.blogspot.com.

A Commemorative Urn
FOR A SPECIAL FRIEND

Kevin Felderhoff

Sometimes you meet a person who is going to change everything and make you want to be a better human being. For me, that person was my friend Gary Kendrick. Gary seemed to have never met a stranger; he loved people and learning new things. After we became fast friends in 2009, Gary found an interest in woodturning. I taught him the basics, and on his first day he turned two wooden bowls. He was so proud of those bowls that he decided to pursue woodturning and made bowls for friends and family over several years.

Earlier this year, Gary sustained a head injury as a spectator at a boxcar derby race. One of the boxcars suddenly veered off course and crashed into a crowd of onlookers. Although he fought to recover, Gary passed away one week later.

A commemorative urn

I decided to turn an urn in Gary's honor and remembrance. Choosing the wood was easy, as I had some beautiful ambrosia maple from a tree that had been removed near Gary's home. He could see this tree from his deck, so its wood was the perfect choice.

I wanted to prepare the urn in time for a scheduled gathering of friends and family to celebrate Gary's life, so I had only five days to complete it. I ordered brass insert threads right away, then found and cut the best piece of wood to use. I mounted the wood on the lathe and turned the urn endgrain to ¼" (6mm) wall thickness in hopes the wood would dry quickly.

When the brass insert parts arrived, I noticed that the urn was not going to be dry enough in time, so I needed to accelerate the drying process. I did so by using a microwave oven in short intervals and weighing the urn between each "cooking." I knew the urn was dry enough when its weight stopped decreasing. I took extreme care not to get it too hot and form any cracks.

After the urn was dry enough and the brass pieces were epoxied to the mesquite top, it was time to remount the urn, flatten its top, and glue on the lid *(Photos 1, 2)*. I then sanded all the parts and reverse-mounted the urn using a jam chuck to turn and sand the bottom. I finished the urn with oil and wax *(Photo 3)*.

Friends and family gathered at my home to enjoy a celebration of Gary's life *(Photo 4)*. We ate and drank, just like Gary would have wanted us to. At the end, we made a toast to Gary, and I privately presented the urn to his wife and daughter. ■

Kevin Felderhoff is a member of the Carolina Mountain Woodturners and lives in Brevard, North Carolina.

The urn in progress

1

2

The hollowed urn is remounted for final turning after drying. Since the urn was made from green (wet) wood and the author was working on a short schedule, he sped up the drying process by "cooking" the work in a microwave oven for short intervals.

The finished urn

3

Memorial Urn, 2018, Ambrosia maple, 11" × 7½" (28cm × 19cm)

A celebration of life

4

Friends and family share a toast during a special celebration of Gary's life.