

# Making Ornaments (and the tools to construct them)

Rev 4 – 6-Nov-2020

This is an attempt to capture the process John Moe and friends have been teaching the club for many years. It is intended as a companion to the video recorded in 2020.

Making these hollow globe ornaments requires turning a round globe, hollowing it, making a bottom (generally longer) finial, and a top (short) finial with a hanging hook, as shown in the pictures. John uses two homemade tools to do the hollowing.



# 1. Making the Hollowing Tools

## Parts

Two 8" pieces of 3/8" mild steel rod (sourced from Home Depot, etc.). The length is not critical, 8" works to make tools that work well with a mini-lathe.

One HSS (5% cobalt) square tool bit, 3/16" square by 2 1/2" long (this is enough to make three bits)

Two pieces of wood for the handles: 2" x 2" x 4" and 2" x 2" x 8". Straight grained hardwood preferred.

Two pieces of 3/4" copper tubing for the ferrules, each about an inch long (not critical).

Cyanoacrylate glue (superglue)

## Tools

Method to hold and cut the steel rod (just as a vise and hacksaw or angle grinder)

Method to round the edges of the cut rod for safety (grinder, sander, etc.)

Method to bend the rod for the bent tool (vise, propane torch, pipe to fit over rod)

Method to score and break the cutter bits into three sections (e.g., vise, grinder and vise grips)

Method to sharpen the cutter bits (e.g., vise grips to hold bit and a grinder to sharpen them)

Method to round base of cutter bit to fit in rod (e.g., vise grips or drill to hold, grinder to sharpen)

Method to punch and drill the rod for the bits (e.g., drill press, bit of appropriate size (5/32"), counter punch, cutting fluid, and vise on drill press)

Lathe and turning tools, including dead center and live center drives, and small chuck

Jacobs chuck and drill bit (twist or Forstner) to drill 3/8" hole in handle for rod

## Process

First step is to cut the rod. One needs to have a flat end for mounting the cutter bit straight, the other needs one end cut at a 45 degree angle to mount the cutter bit at an angle. If you have a 16" piece of rod, you can just make the cut at 45 degrees, and plan to bury the unneeded 45 degree end in the handle of the straight tool.

After cutting, smooth the cut edges so you won't get cut on them.

Bend the rod for the bent tool to look like the pictures. Note that you have to decide whether you will be forward turning or reverse turning, because you need to bend the tool rod differently for each way. Leave approximately 5 inches straight (on the end holding the cutter) for the bent tool.

Next, center punch the rod to center the drill bit, then drill the holes (approx. 1/2" deep). Straight in for the straight tool (rod with flat end), at an angle for the bent tool.

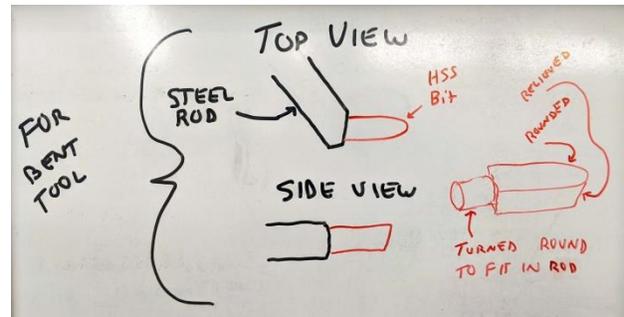
Round off the sharp corner of the end of the bent rod.

Mark the tool bit blank into three segments. Score on these lines, then hold the bit in a vise and use a vise grip to break them off.

Mount the cutter bits one at a time in a VSR drill and with the bit slowly turning in the drill, use a grinder to 1/4"-3/8" of one end of the bit to fit into the holes in the rods. If you don't have a drill to use, then vise grips will work.

Sharpen the cutter bits to look like the pictures using a grinder.

Find the centers of the handle blanks and mount them (one at a time) between centers on the lathe, round over, and put a tenon on one end. Make sure the tenon is appropriately sized for your chuck.



Remount the handle using a chuck to hold the tenon.

Use the Jacob's chuck and twist drill bit to drill (approx. 2 inches) into the handle.

Shape the end of the blank with the hold to fit the ferrule on. Go for a snug but not super tight fit.

Finish shaping the handle, remove from lathe, and clean up the cut off end as needed.

Repeat for second handle blank.

Before you do final assembly, make sure you have ground off excess shoulder on the bent tool and smoothed the area around both cutters to facilitate entry/exit from the opening.

Install the straight rod in the long handle. Use CA glue on the rod to hold it in place, and on the ferrule to hold it. Use CA for mounting the bit.



## 2. Shaping and Hollowing the Globe

### Parts

One piece of wood approximately 2" x 2" x 4" (not critical, it will just determine the size and shape of your globe). There needs to be enough wood to allow for a tenon and room for back side relief cut.

Sandpaper

### Tools

Lathe and turning tools, including dead center and live center drives, and small chuck

Sanding tools if desired

### Process

Mount the blank between centers on the lathe. Turn the cylinder round, and then turn a tenon on one end. Remove and mount in a chuck.

Measure the diameter of the cylinder with calipers, and transfer to the cylinder. Mark the middle of this section, to indicate the center of the globe.

Turn the marked section into a globe (or whatever shape you prefer, e.g., flattened globe, etc.) Leave the tenon end thick for support while hollowing.

Use a  $\frac{3}{4}$ " Forstner bit in a Jacob's chuck to drill out the center of the globe. Use a depth gauge to make sure you stop approx.  $\frac{1}{8}$ " (or more) from the bottom. This defines the wall width you are seeking.

Note that the hollowed inside will never be seen by anyone, you are not trying for a perfect surface; the reason for hollowing is to lighten the ornament so it will hang on a tree more easily.

Start hollowing by clearing the area inside the opening and the middle of the globe. Use the straight tool for this. Clean out the shavings as you go (with, e.g., a popsicle stick).

Switch to the bent tool and clear the shoulder area inside the opening.

Switch back to the straight tool and finish hollowing. Just touch the bottom of the hole lightly, and sweep around to the sides.

Cut a small indentation (or flattened recess) around the opening – this is so the finial will sit snugly.

Now is a good time to sand the outside of the globe.

Turn the stem at the tenon end down to less than  $\frac{3}{4}$ ". Use a parting tool to create a flat/recess at that end for the other finial.

Drill through the ornament the rest of the way with the Jacob's chuck and  $\frac{3}{4}$ " Forstner. The globe should come free.

### 3. Turning the Finials

#### Parts

One piece of wood approximately 1" x 1" x 7" (hard, straight-grained wood)

Sandpaper

#### Tools

Lathe and turning tools to shape the handle, including dead center and live center drives, and small chuck with pen or shark jaws

Sanding tools if desired

#### Process

Mount the blank between centers on the lathe. Turn the cylinder round, and then turn a tenon on one. This tenon should be approx. 1"-1 ½" long.

Create a design for the finial in your mind. Taper the blank to match the rough outline you have in mind. Leave plenty of wood to support the part of the finial that is toward the tailstock end. Check out the picture for some possibilities.



Start shaping the finial from the tailstock end, remembering that the live center will have made a hole in the end that you need to cut off. Once you have shaped an inch or so, take your final cuts, sand it, and don't go back. Continue until you get to the base of the finial. After about ¾" back the tail stock off and work with just the chuck holding the work.

Note that sometimes you can control the form best by turning uphill as opposed to downhill. Use the tools and methods you are most comfortable with.

Measure the flat area around the opening on the bottom of the globe using calipers, and then use that to set the diameter of the bottom “collar” of your finial. After shaping the collar portion, measure the inside diameter of the hole in the globe, and use that to cut a tenon under (i.e., towards the chuck) the collar to the same diameter.

Undercut the bottom of the collar with a parting tool to ensure a snug fit. Part off the finial, leaving some of the tenon on the piece in the chuck – this is automatically the correct diameter to fit in the other hole on the top of the globe.

If you don't have at least  $\frac{1}{4}$ " stub left on the piece in the chuck, extend it while it is still mounted. Then flip the piece around and remount in the chuck, using the tailstock to center it.

Roughly shape the top, then remove the tailstock and finish turning the top. Similarly to the other finial, turn a collar the diameter of the flat on the top of the globe, undercut it with a parting tool, then part it off (if it's not already short enough).

Glue both finials to the globe and you are ready to finish or embellish.



## 4. Additional Tips and Tricks

Use a couple of simple jam chucks to remount the globe for additional work (sanding, embellishment, etc.)



## 5. Embellishment Ideas

