

FOR BEST SUCCESS WITH THIS PROJECT, READ THE FULL ARTICLE A FEW TIMES SO THAT YOU WILL BE FAMILIAR WITH ALL THE STEPS BEFORE YOU START TURNING.

PROJECT:

Awl, specifically designed for woodturners. Tip shaped to mimic general shape of drive and live centres. Handle shape for palm comfort and easy to hold when tapped with a mallet.

MATERIALS REQUIRED:

- 1/4" x 4" (6.35 x 105mm) A2 steel rod. A2 steel uses water rather than oil for hardening. A2 steel also holds a point/edge better than O1 steel.
- Alternate for above: 1/4" x 4" (6.35 x 105mm) High Speed Steel drill blank. This option will cost approximately 4-5 times the A2 steel.
- 1/2" copper end cap (plumbing cap). These are used to fit over 1/2" inner diameter copper pipe, so the inner diameter of the cap is larger than 1/2" it actually is; 0.625" (15.9mm)
- 2" x 4" (51mm x 105mm) hard wood blank. To have a durable handle, use species such as Hard Maple, Ash, Hickory etc
- CA glue (Cyanoacrylate)
- 1/4" drill bit (spur bit preferred)
- Drill chuck with morse taper to fit tailstock
- Woodturning chuck with # 2 jaws and #1 jaws
Note: i.s.o. #1 jaws, a drill chuck with morse taper to fit headstock can be used
- 1/8" parting tool
- 1/2" spindle gouge, bowl gouge or 3/4" skew chisel, whichever is most comfortable to use
- Gas burner; Propylene gas recommended, MAPP gas will work.
- Finish: penetrating oil finish is recommended for the wood handle. Film finishes such as varnish will eventually chip and peel in this application.

MAKE AWL POINT:

Fig. 1: A2 steel rod cut to 4" (105mm) length



Fig. 2: Hold rod with pliers! It will get HOT.



Fig. 3: Heat 1/2" (13mm) of rod end to cherry red, hold for 15 seconds, then quench immediately - moving the rod around - in cold water for a minimum of 30 seconds.



Fig. 4: What your rod will look like after quenching.



If you are wondering why tempering is not part of the process: You will be hardening only the first half inch, the rest of the rod remains in an annealed state. This will result in having the hardest tip possible while retaining flexibility for the remainder of the tool.

Fig. 5: Shape the point as shown below Fit the non hardened end of the rod in a hand drill. Grind the hardened end to a blunt, sharp point as shown by spinning the rod against a spinning grinder wheel. Use only VERY LIGHT pressure to avoid overheating the rod. Have a can of water accessible to help keep the rod cooled. **Grind only the portion of the point that requires shaping.** Leave the rest for the next step which will remove the colour that hardening caused.



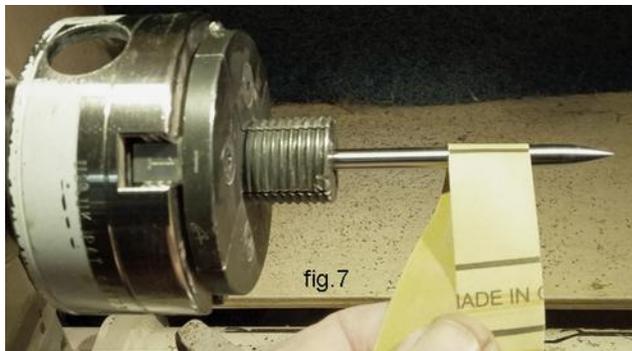
Photo showing point shaping method:



Fig. 6: Mark a line, 1" (25mm) from the blunt end, then hold the rod in your lathe's chuck with the pointed end sticking out and the line near the chuck face.

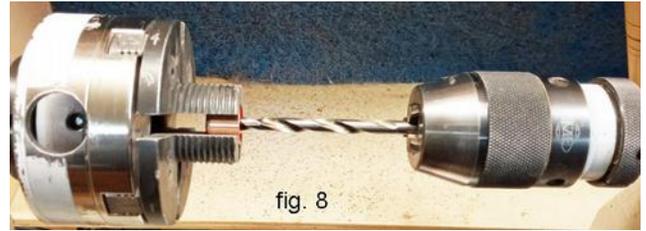
Sand the exposed part of the rod with 220 grit sandpaper. Following this, repeat sanding with 330, 400, 600 and 800 grit sandpapers. Result should be a shiny finish. If you want a satin finish, repeat with 800 grit paper lengthwise, along the length of the rod while NOT spinning.

Fig. 7: The easy way to sand the rod. This method also prevents sanding the part which will be inserted into the handle.



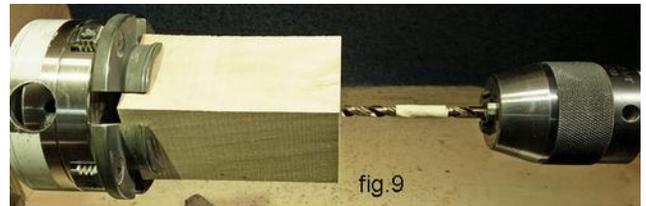
DRILL HOLE IN FERRULE (copper end cap)

Fig. 8: 1/4" hole in copper cap (ferrule) centre.



DRILL HOLE IN WOOD BLANK

Fig. 9: Drill a 1/4" diameter, 1" (25mm) deep hole in the end of the wood blank. The hole should be fairly accurately positioned 90° to the length.



Note depth mark on drill bit with tape.

Remove the blank from the chuck and insert the blunt end of the rod into the hole. The blunt end of the rod should have a small chamfer to help start the fit. It should be a very tight press fit. If not, add CA glue to the sides of the hole and rod before driving the rod fully into the hole. Allow glue to cure before the next step.

START TURNING:

Fig. 10: Mounting work-piece

Mount the work-piece in the chuck (#1 jaws). A drill chuck with morse taper to fit headstock can also be used. Leave at least a 1/2" gap between the chuck and the wood blank. This will give you some clearance when turning the blank.

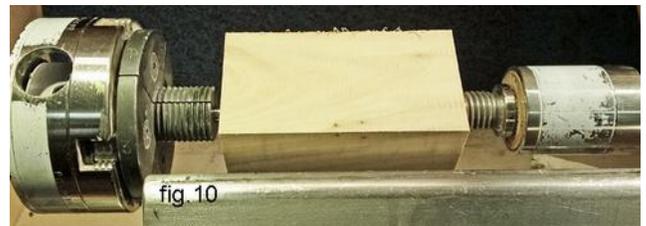


Fig. 11: Turn blank round.

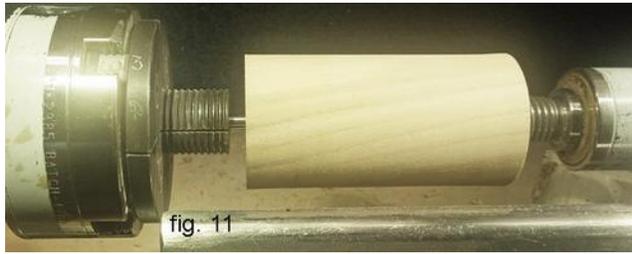


Fig. 12: Mark off transition points. Photo shows using a copy of the drawing as a story stick. Glue to a stiff backing, a permanent story stick.

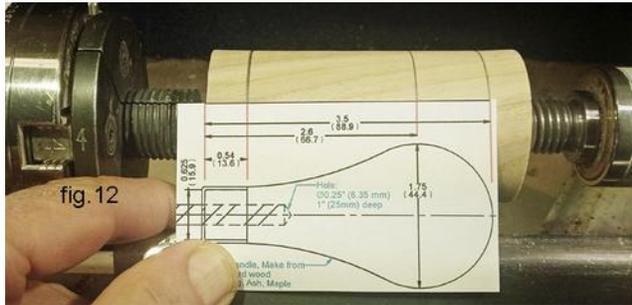


Fig. 13: Using a parting tool and calipers, set the correct diameters for the two left transition points. Turn the right side down as shown.

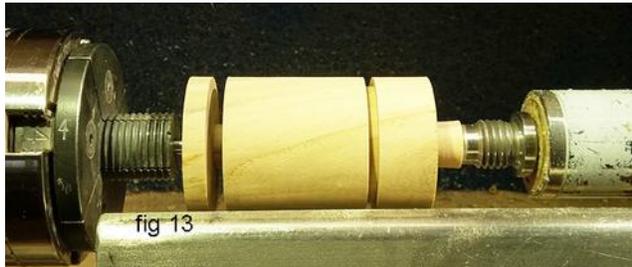


Fig. 14: Turn close to final shape – leave a bit to finish off later. Turn the tenon for the ferrule slightly over-sized



NOTE: LENGTH OF THE TENON ON THE HANDLE MUST BE SLIGHTLY SHORTER

THAN THE INSIDE LENGTH OF THE FERRULE – ADJUST IF NECESSARY. CHAMFER THE END OF THE TENON (ROUND OFF CORNER) FOR A GOOD FIT TO THE INSIDE OF THE FERRULE.

Fig. 15: Remount the work-piece with the ferrule added. Size the end of the handle so that the ferrule will need to be forced on. If it's a loose fit, use epoxy later to hold the ferrule in place.



Fig. 16: Install the ferrule half way on, apply CA glue to all of the exposed wood that the ferrule will cover. Loosen the chuck grip and quickly press fit the ferrule the rest of the way on using the live centre / tailstock. Use epoxy if ferrule has a loose fit.



Fig. 17: Re-tighten the chuck. Turn the handle to final shape. Leave a small tenon on the end to keep the work-piece steady. Sand the handle. Sanding to 330 or 400 grit is more than enough.



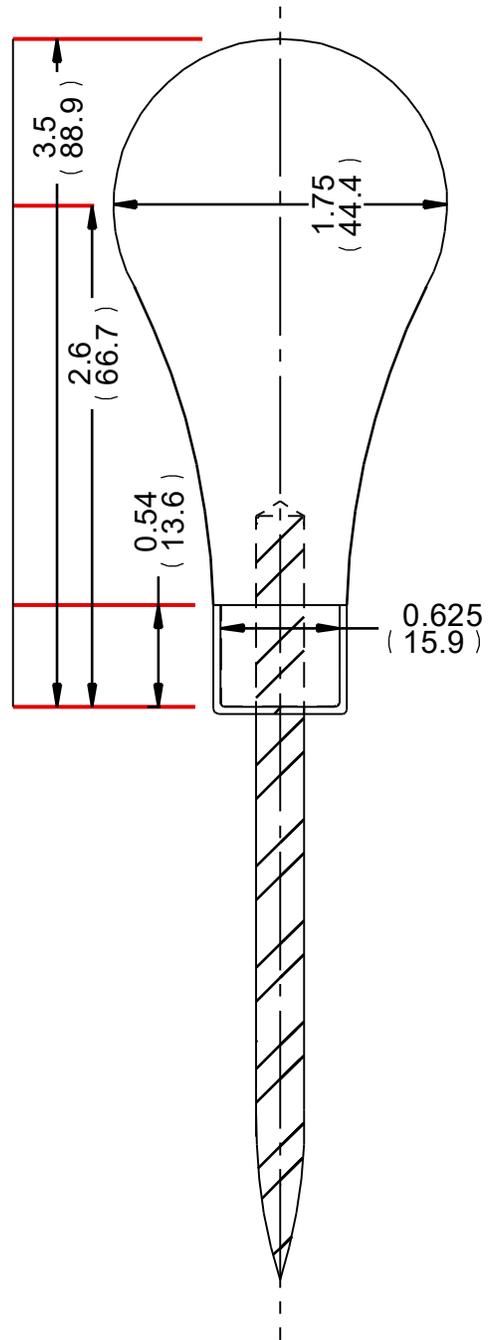
Fig. 18: Pull the live centre back and finish turning the end of the handle. Sand the end. If you wish to have a polished ferrule, pull the Awl back from the chuck and sand / polish.



Fig. 19: Apply finish, allow to cure and you are done. Photo shows the finished awl with an Ash handle and a penetrating oil finish.



Now I have two in my workshop. . . If you are wondering why the wood does not look like White Ash – the blank was part of a group of pre-cut blanks that spent 2 years under water – changed the characteristics a lot!~



**Select “Actual Size” when printing this document.
The above drawing will then be actual size
and can be used to make a story stick.**