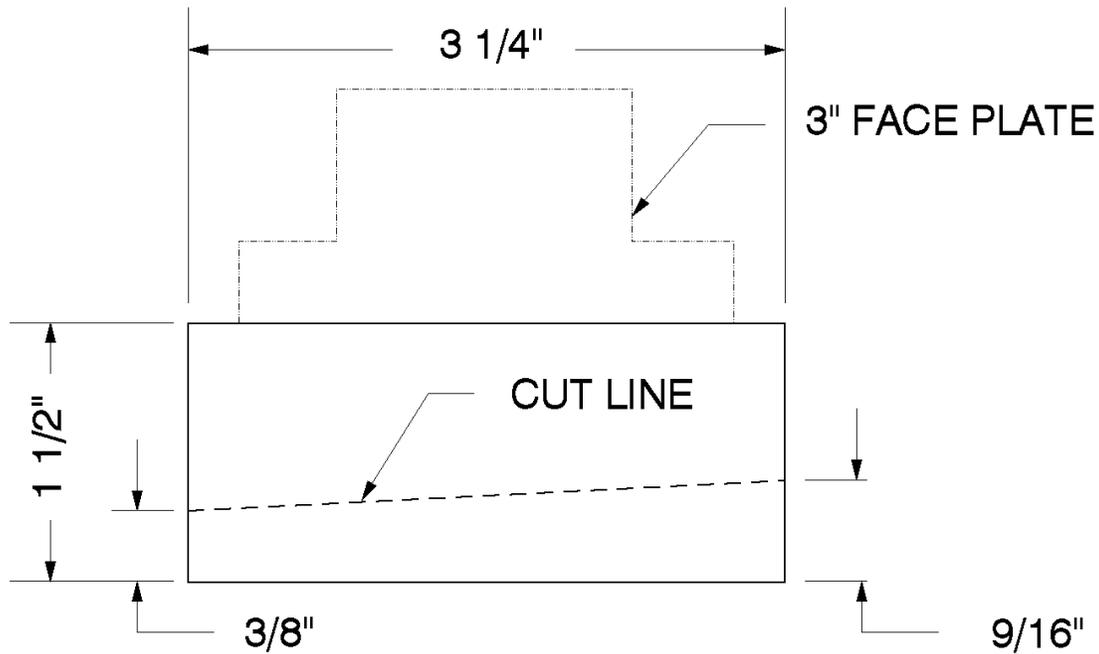


Wobble Chuck

At the recent demonstration by Jean-Francois Escoulen for GCWA, I was increasingly attracted to the offset (eccentric) turnings that are produced when using a Wobble Chuck. In order to experiment with the different shapes and sizes, I designed a very simple chuck to hold and rotate a small turning blank. The type of turning produced by this chuck may not appeal to everyone, but I have found it very intriguing and challenging. Hopefully, you will also.

(Editor's Note: Bill Berry will be showing us his Wobble Chuck at our October meeting. If you have questions or comments about this, join us on October 17.)



— Drawing " A " —

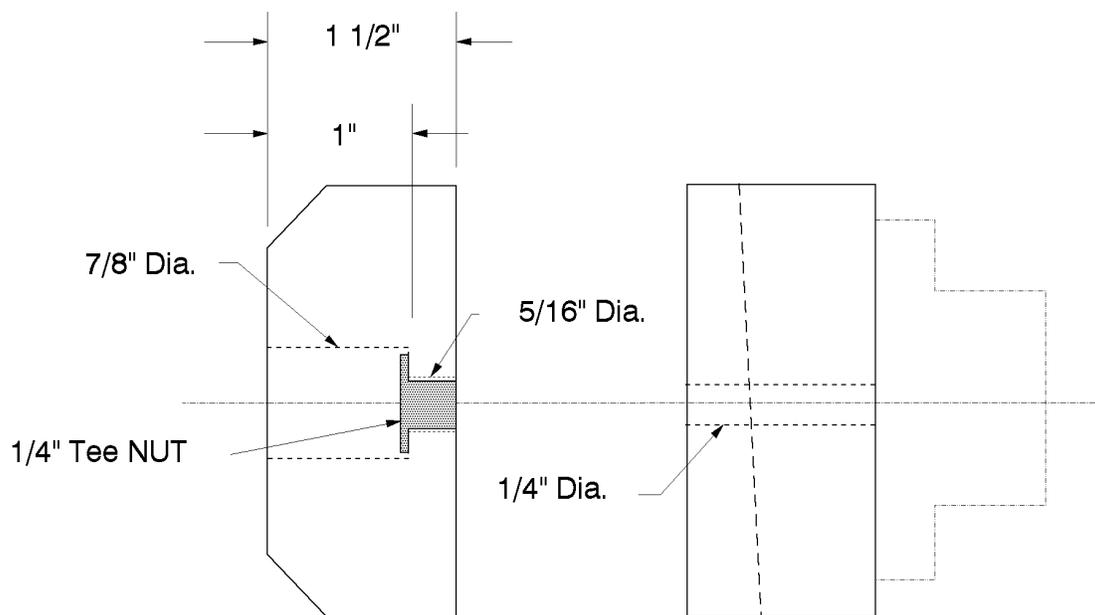
Fabrication

Refer to "Drawing A" and mark a line to be cut on the edge of the 3 1/4" x 3 1/4" block. (A list of materials appears below.) The mark for cutting will be on the 1 1/2" wide edge and will be measured from the same side on both edges. Measure 3/8" on one side and 9/16" on the other edge. The result will be a cut line that is approximately 3 degrees of slope.

After marking, stand the block up on the 1 1/2" side and very carefully cut the line on the band saw. The two sloping sides that have just been cut will then need to be sanded smooth to remove saw marks. The two surfaces must fit together true. Using the thin double stick tape, very carefully stick the pieces back together again as they were before they were cut apart.

Mark a line in the middle of the edge on the side of the thickest and thinnest piece, perpendicular to the cut line. This is a very important step for proper alignment of the chuck.

Attach the 3" face plate to the reassembled block. It is advisable to stick the face plate on with double stick tape until all the screws are secured in the face plate. Transfer the line from the previous step onto the face plate.



— Drawing " B " —

The second piece of 3 1/4" x 3 1/4" x 1 1/2" block now needs to be attached to the above assembly, as shown in "Drawing B". You should now have the blocks stuck together and attached to the face plate. To ensure a good bond with the double stick tape, clamp or apply firm pressure for at least 10 minutes.

Wobble Chuck, continued

Drilling Process

Mount the face plate with blocks attached onto your lathe. You are now ready to start the drilling process with a drill chuck in the tail stock. The drilling must be done very carefully to ensure proper operation of the completed chuck. "Drawing B" shows the details of the drilling process. First: Drill the 7/8" hole to a depth of one inch (1"). Next, drill a 5/16" hole from the bottom of the 7/8" hole to a depth of 1/2" max. The final drilling process is with a 1/4" bit. Using the center of the 5/16" hole as a guide, drill 1/4" hole all the way through both blocks.

Assembly

Use the 1/4 - 20 Internal Hex. Bolt x 2" long w/ washer and insert it into 1/4" hole in the middle of the face plate. The end of the bolt should protrude into the 7/8" hole. Thread the 1/4 - 20 Tee Nut onto the bolt protruding into the 7/8" hole. Tighten the bolt to pull the tee nut down flush into the wood.

Turning

Make sure that alignment marks are transferred to face plate before turning. With the bolt still in place, holding all of the assembly together, turn the wood pieces down to the final diameter –approximately 3". Chamfer (round over) the outside edge of the assembly for clearance, as in "Drawing B".

After turning is complete you must transfer the alignment mark, from the face plate, back onto the body of the chuck. A black ball-point pen works well – get a black line all the way to the chamfer.. If your lathe has indexing holes, use a red pen and trace along the tool rest at about 30 degree increments all around the chuck. Label each index mark with the black line being "0". These marks and labels are essential for

reference when using the chuck. The next step is to super glue the piece of 3/4" copper pipe into the 7/8" hole. The copper pipe can then be trimmed flush with the face, using a high speed steel parting tool with very light cuts.

Final Assembly

Remove the 1/4 - 20 Internal Hex bolt from the chuck. With a small knife, taking care not to cut yourself, very carefully plunge into the taped surfaces and pry them apart with slow, steady pressure. After the pieces are apart, scrape the double-stick tape and residue from wood surfaces. Wax may be put on surfaces for smoother operation. Now you can screw the bolt back in place.

Operation

As you may have already figured out, the copper pipe is essentially a jam chuck, so the next step is very important – take your time and get it right. To prepare a blank for offset turning, cut a piece of wood about 1 1/4" x 1 1/4" x 6" long. Turn it round, and then turn a slight taper on one end. Slope the taper 3/4" from the end of the blank, and of a diameter that will very tightly fit into the copper pipe. Again, this step is very important. After the tenon is properly sized and before it is driven into the copper pipe, place a penny in the bottom of the 7/8" hole. It could be for good luck, but it has a very important role, later.

If your lathe is heavy duty enough, use the force of the tail stock to "jam" the tenon in place – or it can be driven in with a mallet. Insert it the full 3/4" – it must be tight. If it is too loose, try wetting it before inserting. The black alignment marks should all be lined up, (set to "0"), and the bolt running through the middle should be tight.. At this point, when you start the lathe (if you did everything right!) the turning blank should be running straight and true.

Eccentric Turning

The Internal Hex bolt can now be loosen and tightened with a long 3/16" Allen wrench running through the head stock. Without a long wrench, you will have to remove the chuck from the lathe to adjust the wobble and orientation. The "wobble" is increased by rotating the middle disk, and the "orientation" is changed by rotating the outer disk. The maximum amount of wobble for this chuck is about 7 degrees, which is more than enough for most applications.

When your turning masterpiece is complete and you part it off, you now have a piece of wood jammed very tightly into the chuck. To remove it, loosen the internal hex bolt and unscrew the outer disk off of the bolt. Use a bolt (I use an eye bolt) to screw into the tee nut, and hopefully –if you put your penny in the hole before you jammed in the tenon– the remaining piece of wood will be forced out of the chuck as you screw the eye bolt in. If you didn't remember to put a penny in you may have to "turn" the stub out. You will remember the next time. I did.

Commentary

Again, the type of turning produced by this chuck will not appeal to everyone. But for the price of a face plate and some simple materials, you can enter a whole new realm of woodturning. Just don't expect this to be an easy technique, with quick results. Practice and patience are required.

-- Bill Berry

List of Materials

3" Face Plate with at least 1/4" hole in center
(2) 1 1/2" x 3 1/4" x 3 1/4" Hardwood Blocks
1/4 - 20 Tee Nut
1/4 - 20 Internal Hex. Bolt x 2" long w/ washer
3/4" Copper Pipe x 1" long (7/8" O.D.)

1/4 - 20 Eye Bolt x 2" long
Double Stick Tape (Thin)
7/8" Forstener bit
5/16" Drill bit
1/4" Drill bit