

## PENDEL PENCILS WITHOUT THE STEPDRILL

I recently found instructions for making a pentel pencil using the commercially available pentel mechanical pencil, removing the mechanism and installing it and the rest of the parts into a pencil body turned from your favorite pen blank. The instructions are available on Craft Supplies' website (<http://www.woodturnerscatalog.com>) with their other project instructions. Instructions are also available in the files area of the Yahoo Penturners group. Both sets of instructions require the use of a step drill which I did not want to purchase since it cost \$24.99 and I wanted to build the pencil now! So I purchased some of the pencils and began my journey.

I took measurements, drilled one size hole then tried to chase it and drill a smaller hole at the writing end centered on the larger hole. I failed. I tried again and failed again. Thirteen tries and 13 failures! In Fig 3 at the right are some of my failures. Thin walls on the writing end posed the biggest problem along with drilling alignment. I eventually made some "homemade" tools and made 5 in a row with no problem and was asked to share my method with the group. I hope these instructions make sense, but if need be, email me at [don@RedRiverPens.com](mailto:don@RedRiverPens.com) with your questions and I will do my best to answer them. The pencil is fun to make and is a nice writing pencil.

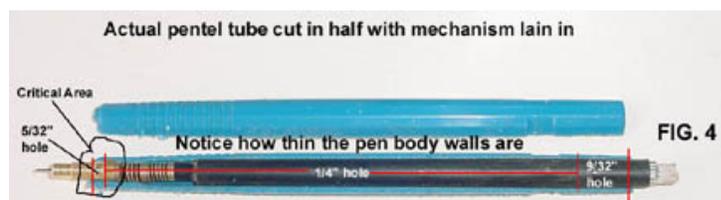


A list of things you will need to make the homemade tools are:

1. two pieces of hardwood....2" square x 3" long (I used scrap osage orange)
2. one 5/32" drill bit and one 9/32" drill bit
3. one 1/4" drill bit 6" long...I could only find a 12" so I cut it off and will use the rest to grind some small cutting tools
4. a piece of 1/4" unthreaded steel rod
5. 1/4" transfer punch
6. 1 expendable slimline brass tube and slimline bushing
7. pentel pencils
8. wood blank.(I suggest using scrap wood for blanks and practice until you have the process mastered. It won't be difficult...I've made all of the mistakes, hopefully, but just for insurance and preservation of your good blanks)

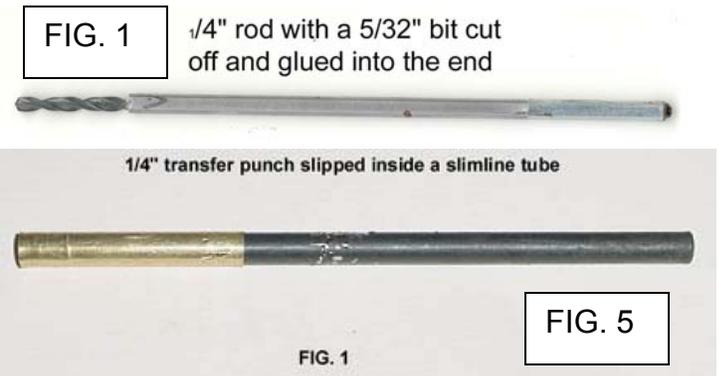
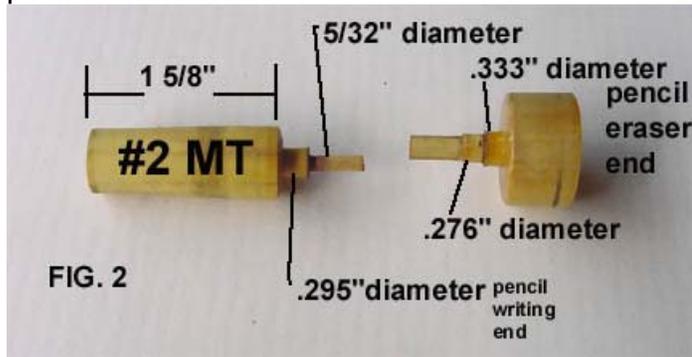
### **INSTRUCTIONS**

Look at the cutaway view of a pentel pencil at the right in FIG.4. The critical area encircled is the problem giver. A solution was found, so here are the instructions step by step.



Step 1) The first step is to make two pieces to hold the blank in the lathe. The head stock piece will be a #2 MT turned from a piece of hardwood. I used a piece of osage orange. On the large end you need to turn a tenon to a diameter .295", the diameter of the finished pencil end) about 1" long. This tenon will step down to 5/32", which is the diameter of the hole in the end of the blank. This smaller diameter will slide inside the hole in the end of the blank. The tailstock piece needs to be 1" in

diameter and 1.75" long. On one end part off a tenon about .75" long with a diameter of .333". This will be the pencil end diameter and should be half of the length of the tenon and should be next to the 1" diameter. The rest of the tenon needs to be 5/32" and this part will slip into the eraser end of the pencil. See FIG. 2

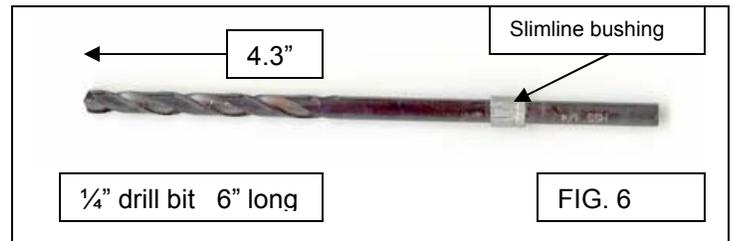


Step 2) Next a 5/32" hole must be drilled in one end of a 1/4" steel rod. I had trouble finding the exact center of the 1/4" rod. So, I took a 1/4" transfer punch and slipped a slimline tube over the end with the point about half way and slipped the 1/4" rod in the other end of the brass tube. Stand the rod on a sturdy base and hit the transfer punch with a hammer to make a dimple on the rod centered. You may have a better way, or better tooling than I, so use whatever method you have. Drill a 5/32" hole into the rod using the centered dimple to keep the bit from wandering. Drill the hole about 1" deep. Cut the 5/32 bit in half and glue into the hole drilled in the 1/4" rod. I used JB Weld to glue in the drill bit . I suppose poly glue or epoxy would work, but CA did not. I lost the 5/32 in the wood blank in a later step, but was able to retrieve it. See FIG. 1 and FIG. 5 above for the transfer punch and the homemade 5/32 bit. It needs to be this way to drill a 5/32 hole centered on a 1/4" hole. Again, you may have the tooling to do this and you will not need to make this tool.

Now, finally we can start making the pencil!

Step 3) Cut the blank 4.5" long.

Step 4) Drill a 1/4" hole in the blank 4.3" long. To achieve this, I glued a slimline bushing to the drill bit 4.3" up from the cutting end. This drilling length is critical. See FIG.6 to the right.



Step 4) Use the 5/32" drill bit made earlier, FIG. 1 to drill the small hole in the end of the blank. The 1/4" rod will be a very tight fit. I placed the rod in a chuck on the lathe and sanded with 150 grit paper until the fit was not so tight. Place the 5/32" homemade bit in your drill press and chase the 1/4" hole in the blank until the 5/32" bit exits the blank. Do the math, you only have .2" to drill. But the 5/32" hole will be centered on the 1/4" hole. You may have a better way of doing this, so if you do, use it.

Now , on the eraser end of the blank, chase the 1/4" hole with a 9/32" bit to a depth of .9". A 1" long 9/32" will work if you have no calipers. You are now ready to put the blank on the lathe and turn ☺.

Step 5) Place the blank on the lathe, turn, and finish. Use the two pieces made in step one. The pencil's writing end will be at the head stock end of the lathe. See FIG. 2. The writing end gets a little thing but



the Measurement I've given you is a little large. I actually turned a bead on a couple of my pencils to make the end a little thicker. You can see the bead on the pencils at the end of this article.

Step 6) Before removing from the lathe, a groove needs to be cut to accommodate the clip. It needs to be very shallow, .270" wide, and start .75" from the eraser end of the blank. I just held the original plastic pencil tube next to my newly turned blank and marked top and bottom with a pencil.

Step 7) Disassemble the pentel pencil you purchased and reassemble using the new pencil tube you just turned.

You are now finished. It was lots of work but all of the tooling you made is useable over and over. An easy out would be to purchase the step drill bit for \$24.95, but that buys a lot of pen kits. I had as much fun figuring this out and making the tools as I had making the pencils...well just about as much fun.

At the right in FIG. 7 are 3 finished Pentel pencils. Enjoy this project.

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