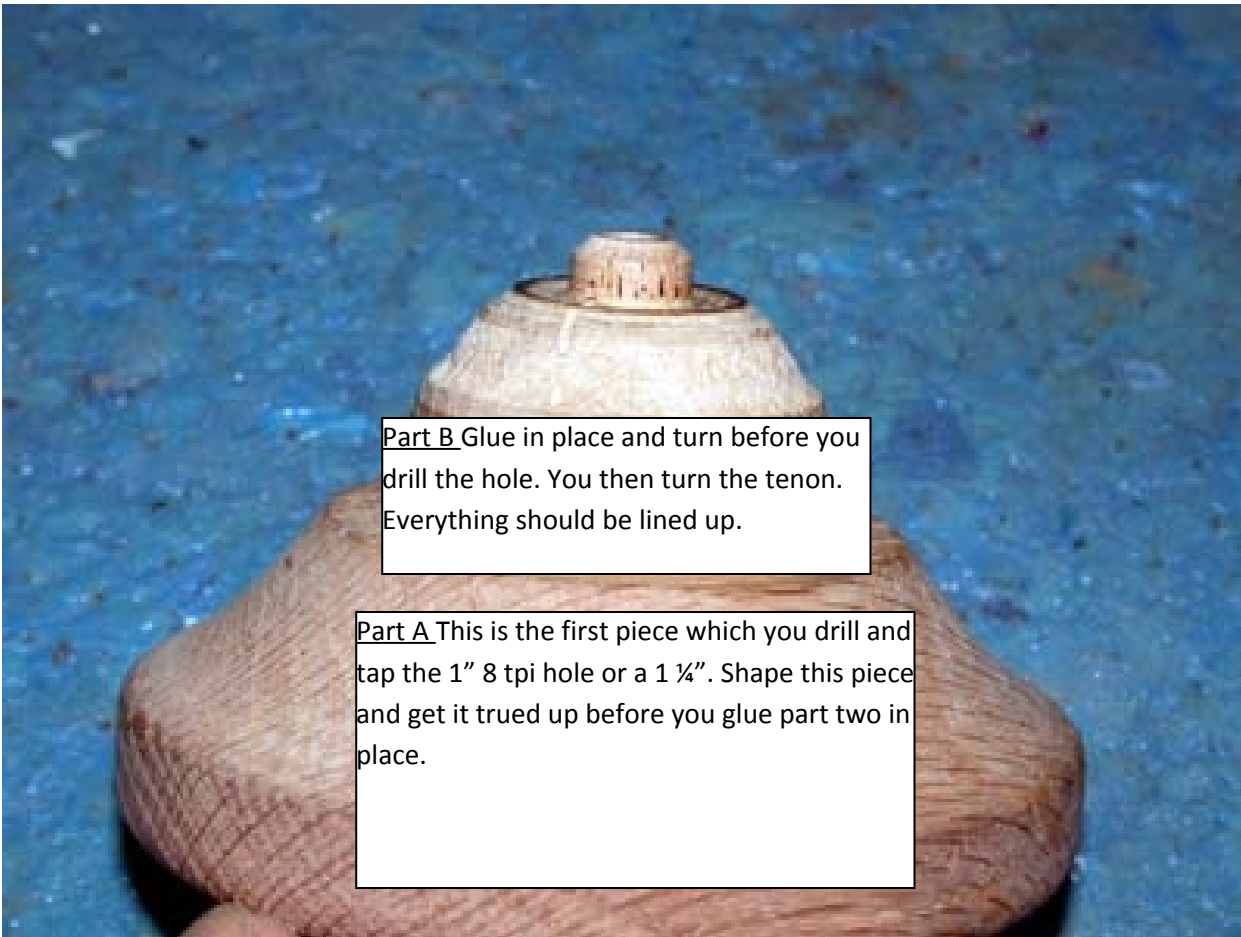




In order to make the ornament in this presentation you will have to make a device similar to this to hold your wood for turning.

I will try to describe how to build this jig. In the photo you will see the hardware, it is simply a toggle bolt bought at any hardware store. The wood should be a hardwood such as oak, maple, etc. Make sure you are turning end grain for part B. READ ALL THE DETAILS FIRST TO UNDERSTAND HOW IT IS MADE.

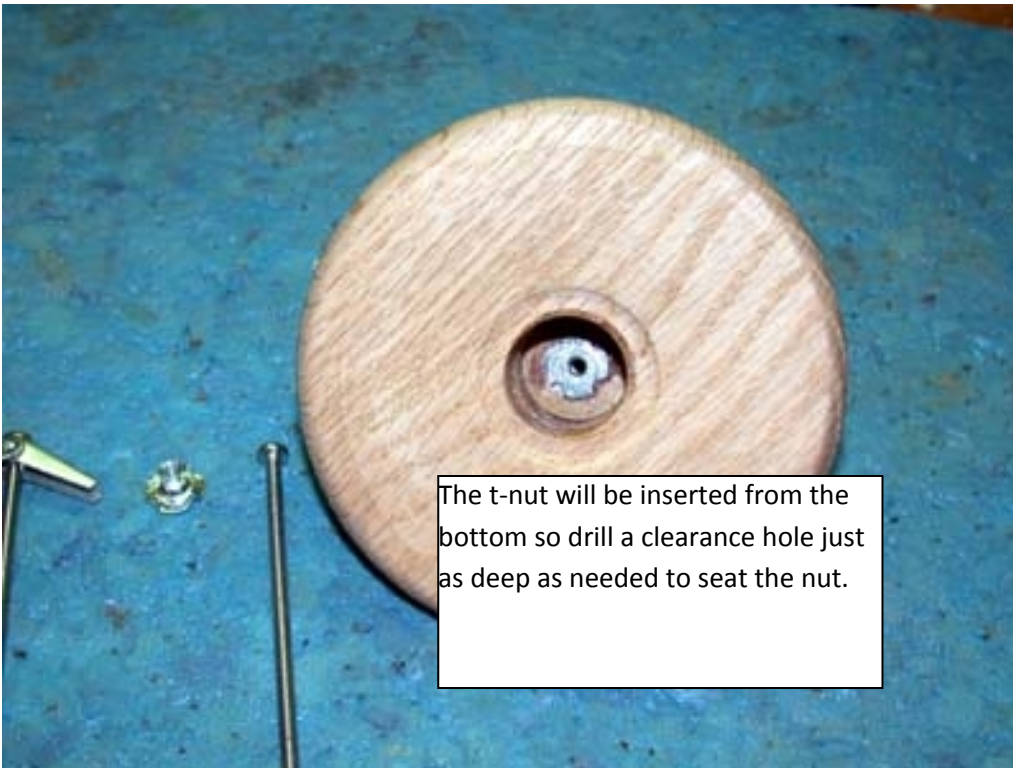


**This device is made in two parts. Part A will be drilled and tapped for your own lathe, this should be cross grain, it threads better than end grain. 1" 8 tpi or 1 ¼" spindle size, the one shown is for a 1" 8 tpi. After you cut the threads in Part A leave it on the lathe and true it up on the face. ( TIP- you might want to put CA glue on the threads to stabilize them, before you go on).**

**NOTE: Cross grain is easier to tap and is more stable when threading. This jig's second part will contain the t-nut for the toggle bolt. Note: this piece must be end grain because the tenon is turned to ½" and if you use cross grain the tenon will split off very easily. Glue these two together and follow instructions on the following steps.**



**This set up will keep your ornament turning on center. This is the reason for waiting till you have it glued up before you drill. As you see I already have my tenon, I didn't want to make another jig. I made this jig six or seven years ago and it still on center. Remember to drill the hole on your lathe that makes it dead center. You may have to borrow a chuck with a #2 Morris taper for in your tail stock, or buy one.**



After you turn the second part, drill a 9/64" hole thru the bottom (see photo below); measure the t-nut to get the correct size drill, then drill the hole to press the t-nut into. As you know the t-nut has spurs that are pressed into the wood and I will presume that you know how to seat a t-nut. This view shows the t-nut from the back side. The reason for placing the t-nut in this section is eventually this piece is used up, because you periodically have to refresh your tenon. If you have to replace Part B, you will not have to cut new threads in Part A.

Once you get the t-nut seated you can use CA glue to hold the t-nut in place. Be careful not to get the glue in threads.



You may need to drill small holes for the spurs.



**These bolts may be too long but you can shorten them according to the dimensions of your jig. The wings of the toggle can be ground back in length by 25% (will hold better and will not crack the thin sides of shaped piece don't over tighten the toggle).**



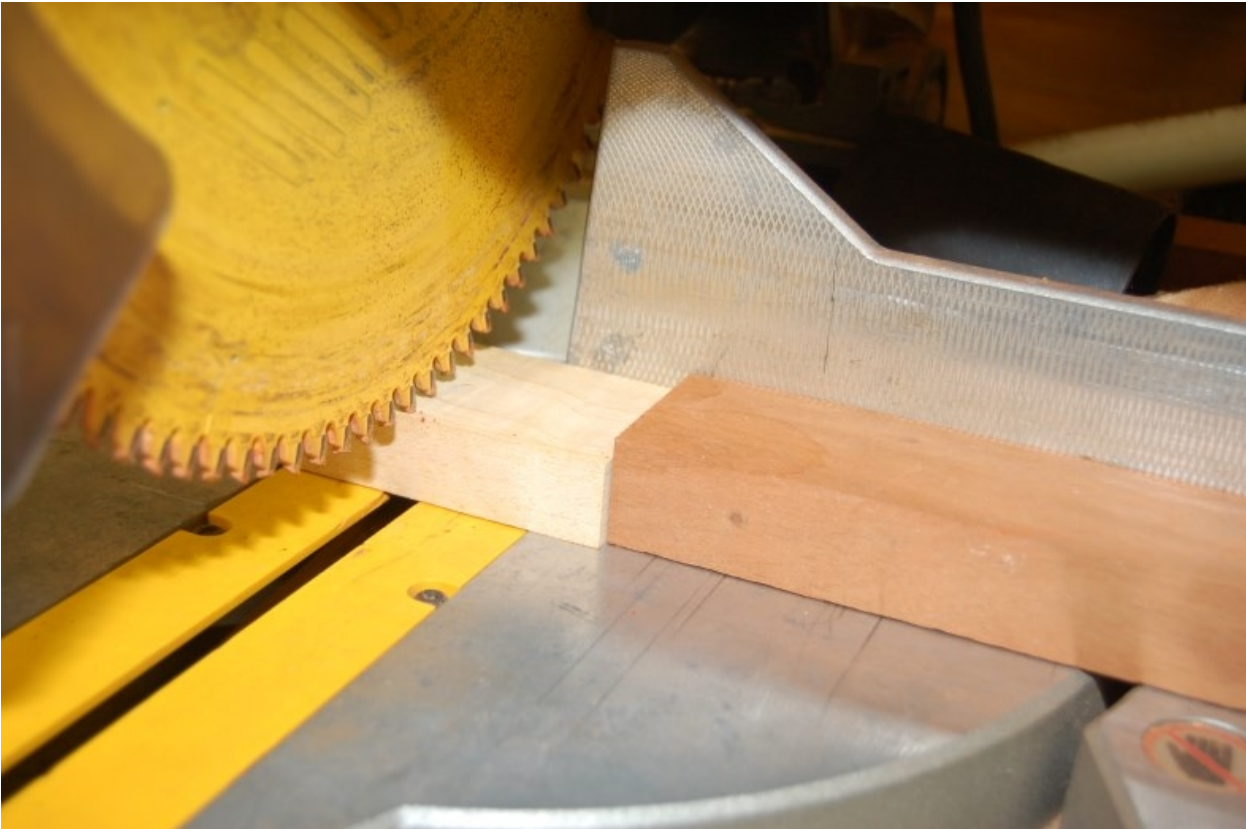
The only thing left is to turn the tenon to  $\frac{1}{2}$ " to fit the pieces of wood that you will cut and drill as per the instruction that will follow.

**NOTE:** It is not necessary to make Part A as large as I have made it, that's just the size I started out with. You may want to cut down the diameter about half. The size is not critical.

I would like to thank *Jack Diamond* for inventing this toggle bolt jig. It works well and saves you from having to buy thicker wood then having to hollow it out. You can't beat the price for your wood. Go to your friendly cabinet shop for their scrap cut offs.



**The following demo depicts how to make a Christmas ornament out of scrap wood from a cabinet shop's cutoff pieces from rails and stiles. I got this wood from their dumpster. All you have to do is ask them for the wood. They have maple, cherry, oak and other hard woods.**

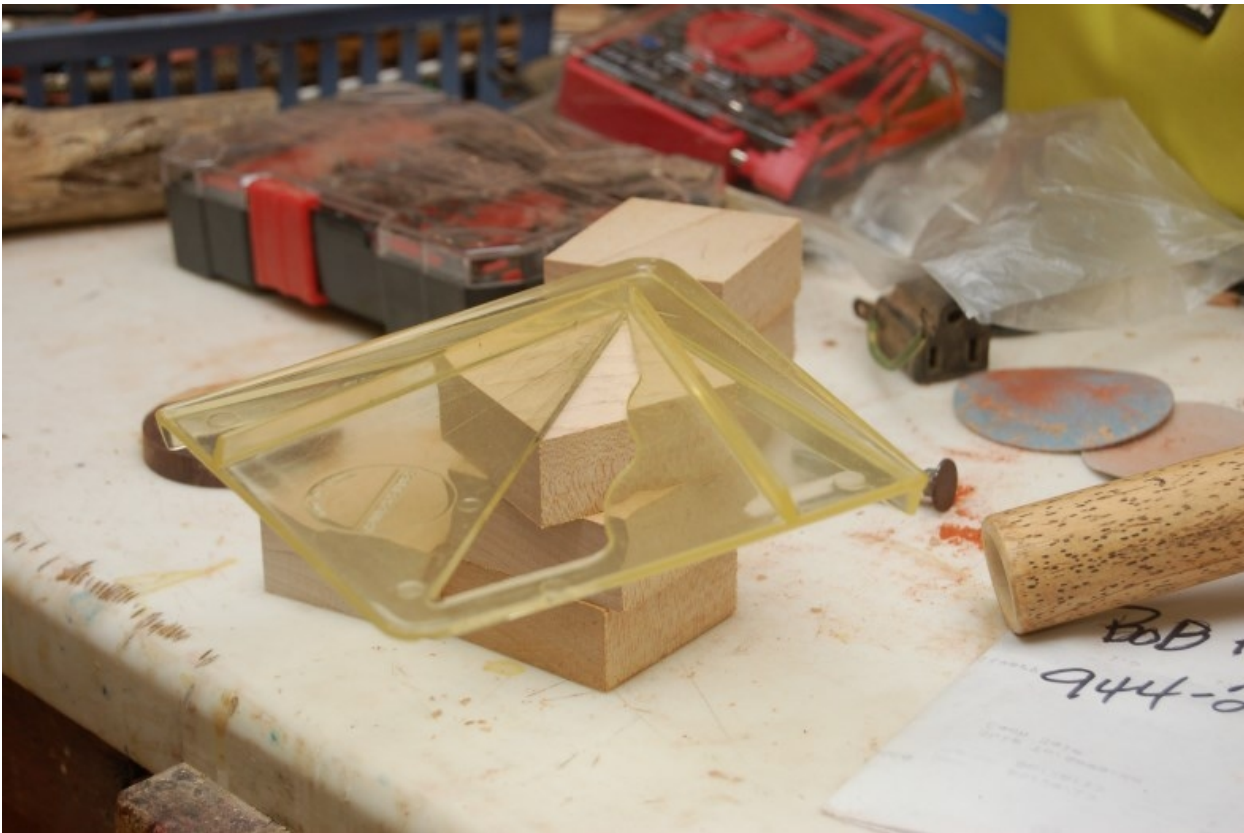


**You can use your chop saw to cut up the pieces into approximate squares. Measure the width of your stock then set your stop block to match. Then cut the pieces to size.**



**One piece of stock will make several small ornaments with an extra piece for an error if you need it.**

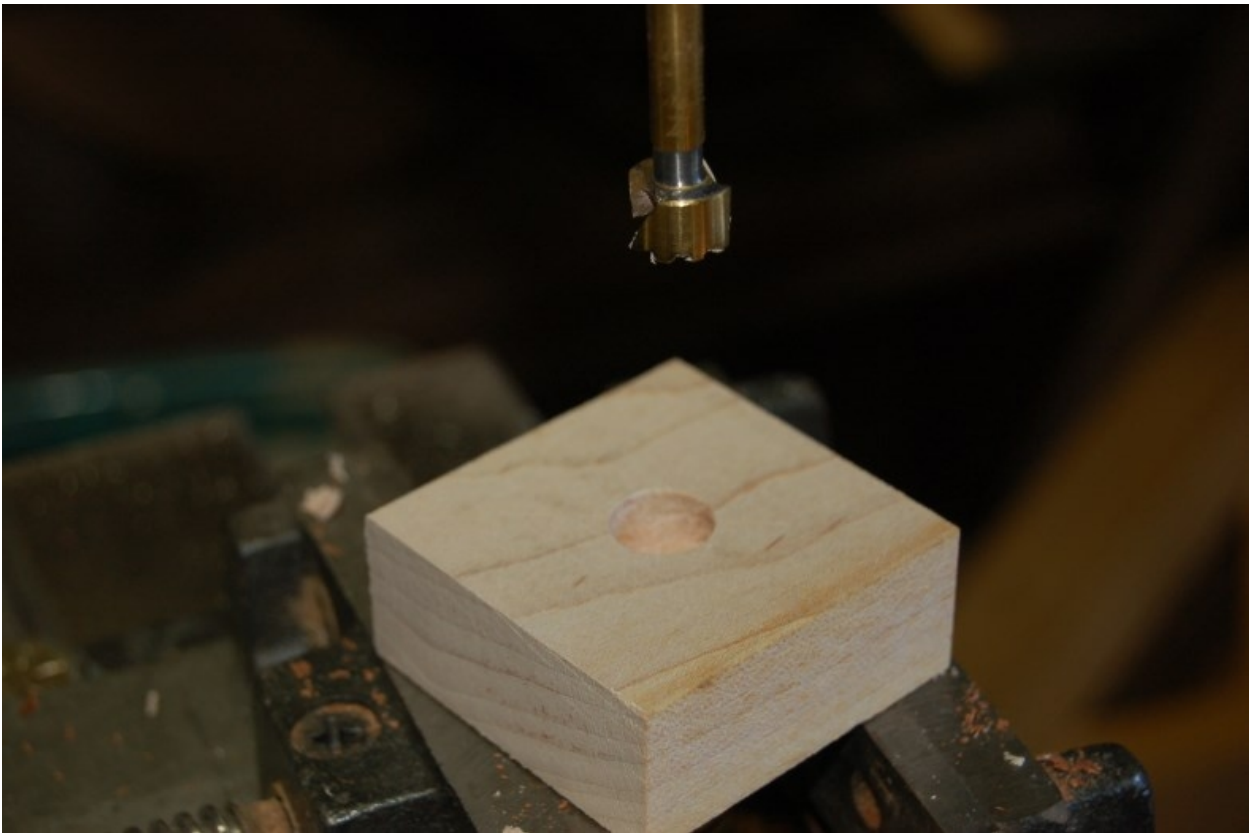




**Mark the center of each piece by using your own method of finding the center.**



**You should drill a clearance hole for the bolt that comes with the toggle bolt. You need to drill a  $\frac{9}{64}$ " hole for the bolt on the  $\frac{1}{8}$ " toggle. Do not drill a  $\frac{1}{8}$ " hole because the bolt will thread in your piece and you won't be able to tighten the bolt securely.**



**Next take a ½" forstner bit and drill a hole in the block the depth of the sides of the bit or a little less.**



**Fit the drilled hole over this tenon and place screw into the t-nut and tighten in place.**



**Once tightened, it looks like this. All you have to do is turn this piece to shape.**



**As seen from headstock side after being tightened**



**Shape this half of your ornament to look like this.**



**Use your gouge or scraper to hollow out the inside to look like this. Notice that I cut deep enough to reach the drilled hole. You should now remove this piece and put it aside. As you cut to the center, you may fear that the piece will spin loose. If your tenon is a tight fit in the hole, this will not occur. As you remove the bolt, the round small piece of wood will come away with it. If this is your second half go to the next step.**



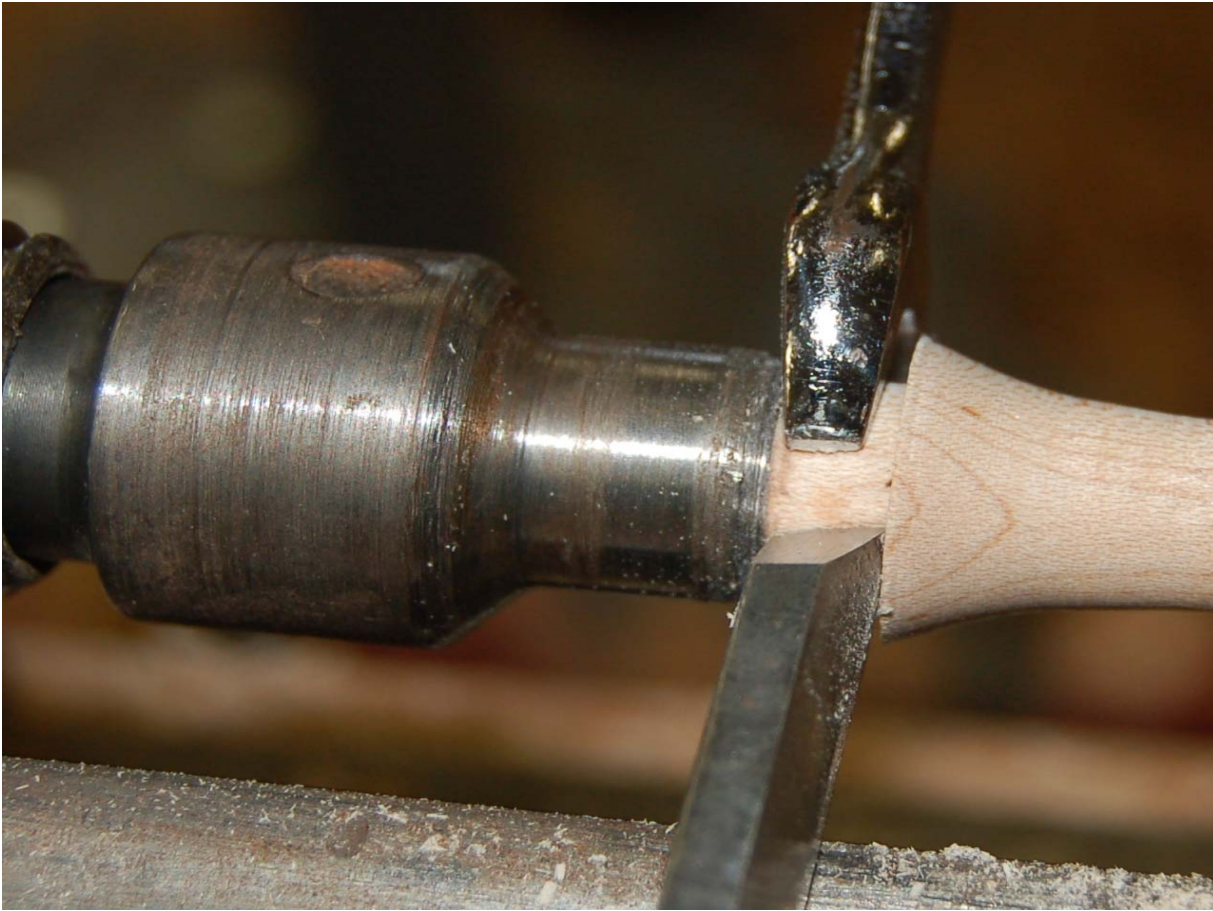
**This is the second half of your ornament. You will use the toggle bolt reversed to hold this half of your turning. Note: you may want to true the rim with a gouge or a sanding block. Apply CA glue to the rim and place the other half's rim against this half. Pull the tailstock up to apply pressure to hold the two halves together.**



**The drying time is very short. Once the glue dries, pull the live center away and finish the glue joint and this end of the ball. Extract the toggle bolt, reverse the ball, finish the other end.**

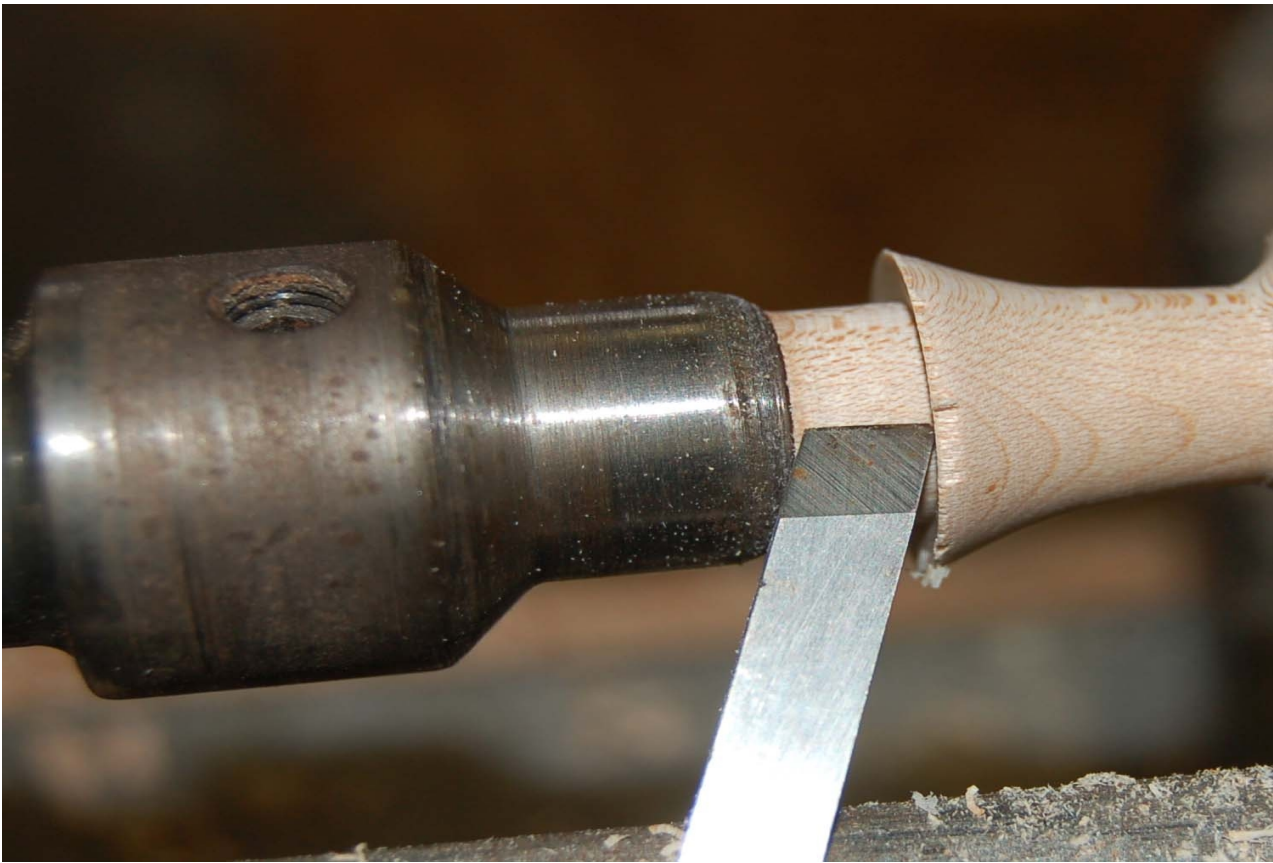


**Here I have reversed the ornament around to show how the toggle fits thru the 1/2 "hole. The collapsed toggle must pass through your drilled hole. A cordless screwdriver is very useful for tightening the long bolt. A replacement bolt with a Phillips recess is preferable.**



**Make the finials with a  $\frac{1}{2}$ " tenon to fit the  $\frac{1}{2}$ " hole. Glue them into the ball.**

**Note: To get the tenon exactly  $\frac{1}{2}$ ", I use a  $\frac{1}{2}$ " wrench (double check distance between flats with micrometer) for a gauge when cutting the tenon and a  $\frac{1}{4}$  parting tool (for tenon length).**



**After you cut the tenon there is one more step, take a small pointed skew and undercut the finial so it will fit the outside of the ball parts taper. This reduces the gap between the finial and the ball and makes it flush.**





**As you can see the fit is tight. Happy Turning! Here is some more of that red wood that I use.**