

Lathe Work – A Cannon and Ship’s Bell

Lee Byrne

The first thing you should try turning is a bell. Everyone wants to start by making canons, these are hard to do and easy to screw up. On the other hand, a bell is a small project that will teach you everything you need to know, and if you screw up, not much time or effort has been spent. Also, you can use very small pieces of metal for this- saving your stock for when you are able to turn a good canon.

I won’t use a taper tool for this, it will all be made “free hand”-this is an important skill to learn.

Chuck a short piece of brass, and face off just like the start of every turning. Now I am using 1 inch brass rod for this-a huge waste. But it is all I have at the moment so its what I used. Try to buy the stock as close to finished diameter as you can, this saves you time and money.

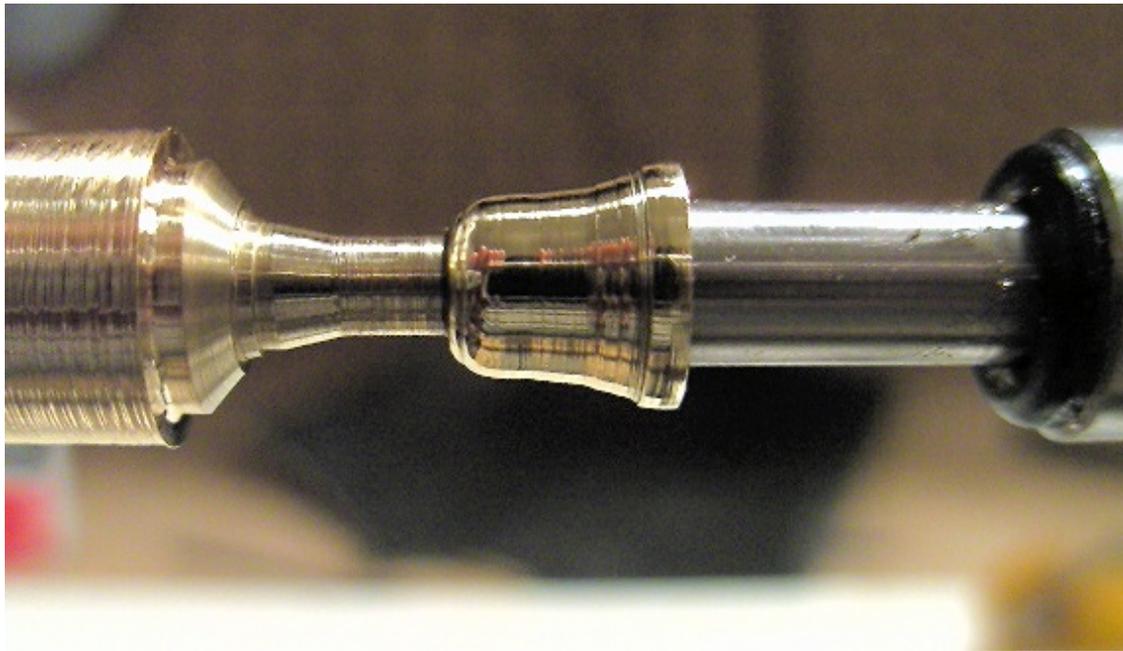
Get a picture of a bell, or at least have an idea of what you want in your head first-and remember, a bell does not look like half of an egg shell!

I am not going to go through all the steps of turning a bell; I will just show some high points.



Here is the bell almost done, and notice the tiny HSS finishing bit. Also if you look close, just on the other side of the bit-the brass has funny marks on it (kind of like lines radiating from the center)-these are marks from using the dull side of the bit for turning-a bad habit but not a dangerous one. You can get away with taking tiny amounts off this way, just make sure this bad finish is not on the bell itself! And doing this will make one of the noises you must listen for and be able to identify-noises are important in turning metal. Learn to identify all these noises, by knowing the sound instantly you can make corrections before you ruin the turning.

Also notice the boring that was done inside the skirt of the bell-even on this short piece it hard to get a really good finish because the turning is not rigid when you do this.

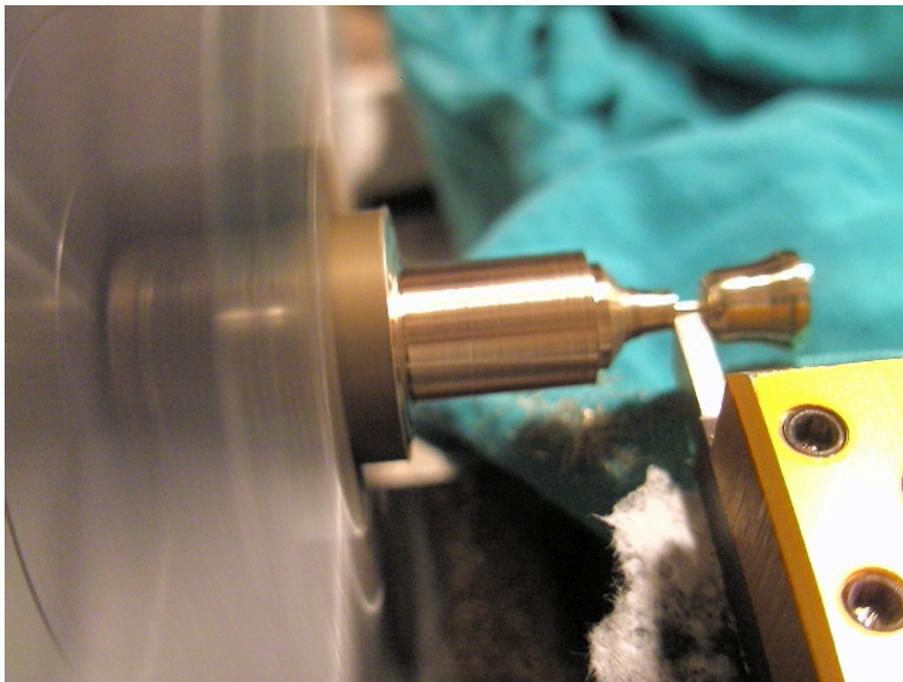


Here you can see I am getting ready to part the bell. Notice the shape, not straight lines at all. You do this by turning both hand wheels at the same time-it takes practice and a light touch (maybe you remember a toy from your childhood called an “etch-a-sketch“-same principal!). On the far left, you can see the finish is rough, and that’s ok because that’s what’s called “roughing out”-just turning the stock down to close to the finished diameter-the look is not important and could even be done with carbide (and that was).

Also, I have inserted the live center into the bell. As the stock gets thinner and thinner chatter is going to happen. I am using a live center here because the inside is finished, and a dead center would leave ugly marks.

NEVER completely part a turning off with a center in the work! This is dangerous and unnecessary-and even if you don’t get hurt, the turning will probably be ruined. Only use a center until the very end, then slide it out of the way and cut the last tiny bit of metal.

You can see my fingers as I am taking this picture in the reflection of the bell, that’s a good finish and exactly what you are after.



Here is an important picture. First, notice the stock shaped parting tool-I only used this picture because of it. Notice how wide it is, totally unnecessary for this turning. Also, see the piece of greasy paper towel under the bit as a shim? And absolutely no center inside the turning during parting.

Another thing in this picture, is the green piece of cloth. This will protect the turning when it falls off, just be sure whatever you use cannot be grabbed by the jaws of the chuck!

Now a couple pictures of the finished bell.

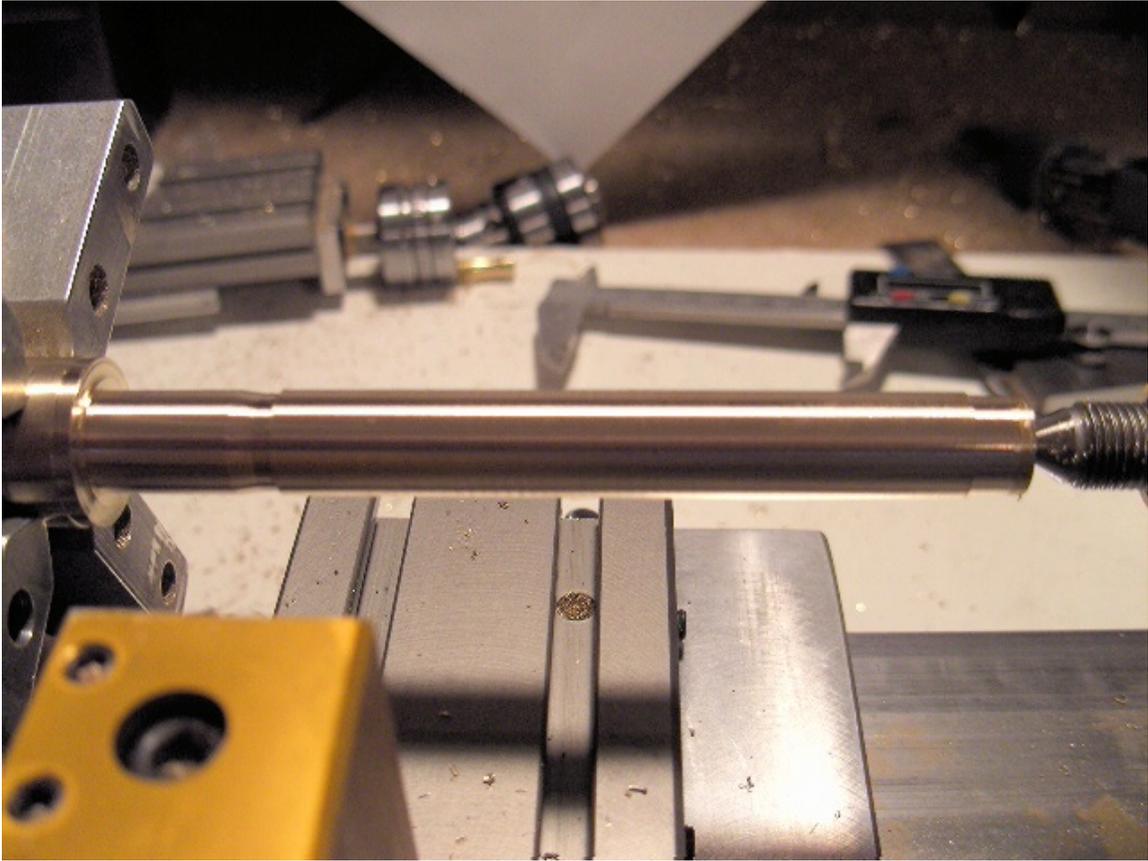


You can see how small it is first off, not much stock was used. Second is notice the molding, nothing special was used here but the tiny, pointed finishing bit I showed you earlier. This is not the greatest bell, but it is great practice giving you all the needed skills for a harder project, like a canon.

Turning a Cannon

Now comes the fun part for me! You have seen the highly decorated French cannons on this forum. All these canons are cast, but first you need a “master” for making the mold. I am going to turn mine before I clean up this mess. If you have done some practice and followed this tutorial, you can now do this.

This part will be heavy on the pictures, light on the words.



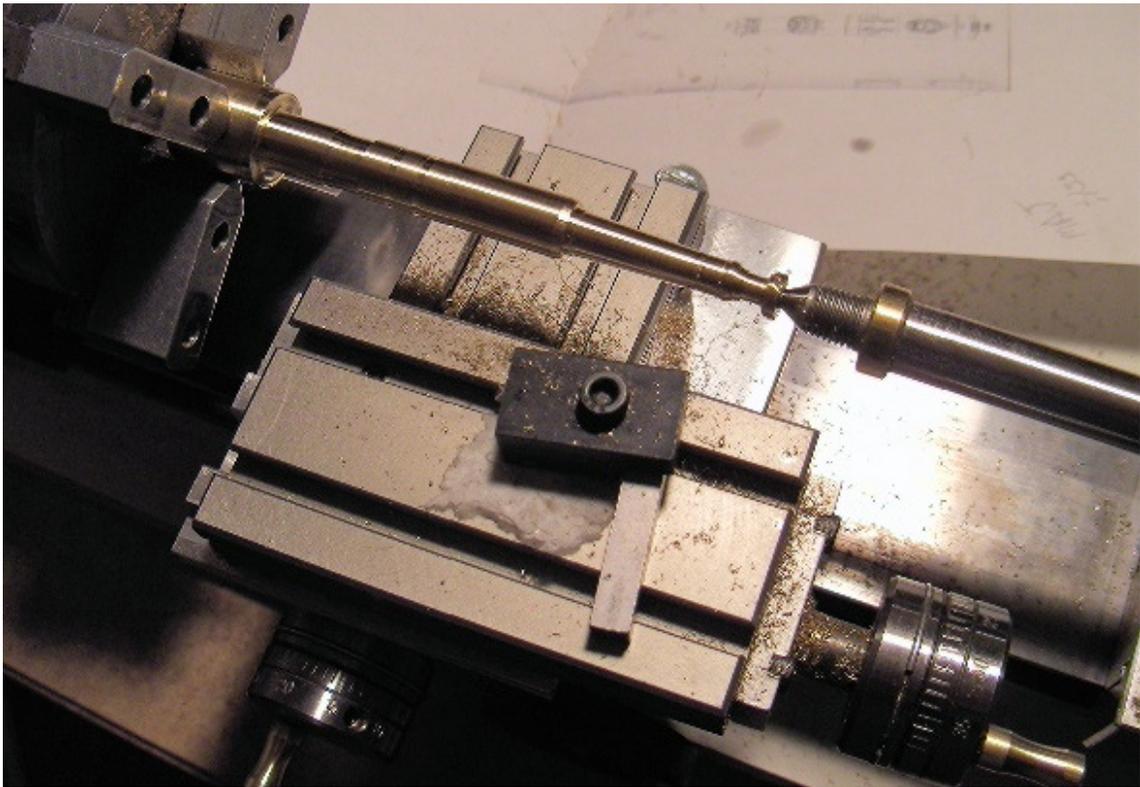
Turned to the rough diameter, total length marked out.



I have measured and marked out all the moldings and shoulders.



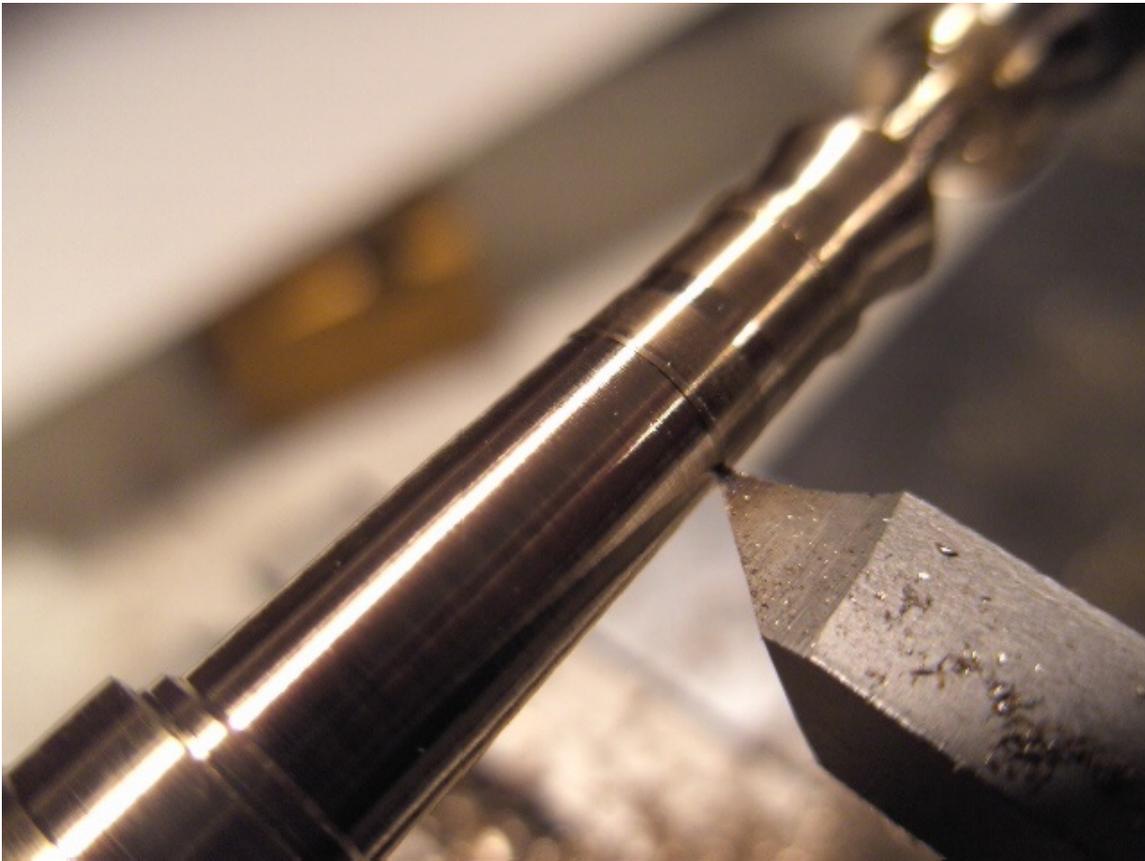
I am beginning to define the muzzle.



I have added the tapering attachment, set at 2 degrees. The hand wheel is on the right. Funny looking tool post, yours might be different for your taper attachment.



Good shot of my finish bit, I am working the muzzle quite a bit because it is a hard part, you learned how to do this making the bell. If I screw up now not too much time was wasted-and I will just start over.



Great shot of the bit, starting to make moldings. Look at the finish.



Finished muzzle and molding, all done with finishing bit.



Notice the dead center and the extra material at the end of the canon-this is so I can continue to use a dead center. A dead center is just a little more rigid then a live one.



Moving up the barrel, starting to define moldings and a shoulder. I am always checking the measurements from the back of the canon.



Here I am tapering and always checking the diameter, and measuring very often. This is the beginning of the next reinforce.



Here is an important part I almost forgot to mention. You might ask how I get all those molding shapes. The tool post I am using can be turned and tightened at any spot in a full 360 degrees-it is a stock tool post. By turning the post just a little (like this picture shows) an infinite number of “shapes” can be made with this one bit. If you have a lathe that the tool post cannot be swiveled on-you will either have to modify it too do this-or just make bits to the angles you need.



Both “shoulders” or “reinforce” are done here, kind of a bad shot. Also notice how fine the shavings are-I am running the lathe at about 2200 RPMs, but I am feeding VERY slow-just enough feed speed to give a good finish-but not fast enough to accidentally ruin the turning.



It is easy to see in this picture how I made the molding, these are very small but because the bit tip is also—they are not hard to do.



Starting work on the cascable, again the trick to “rounding” is learning to turn bells.



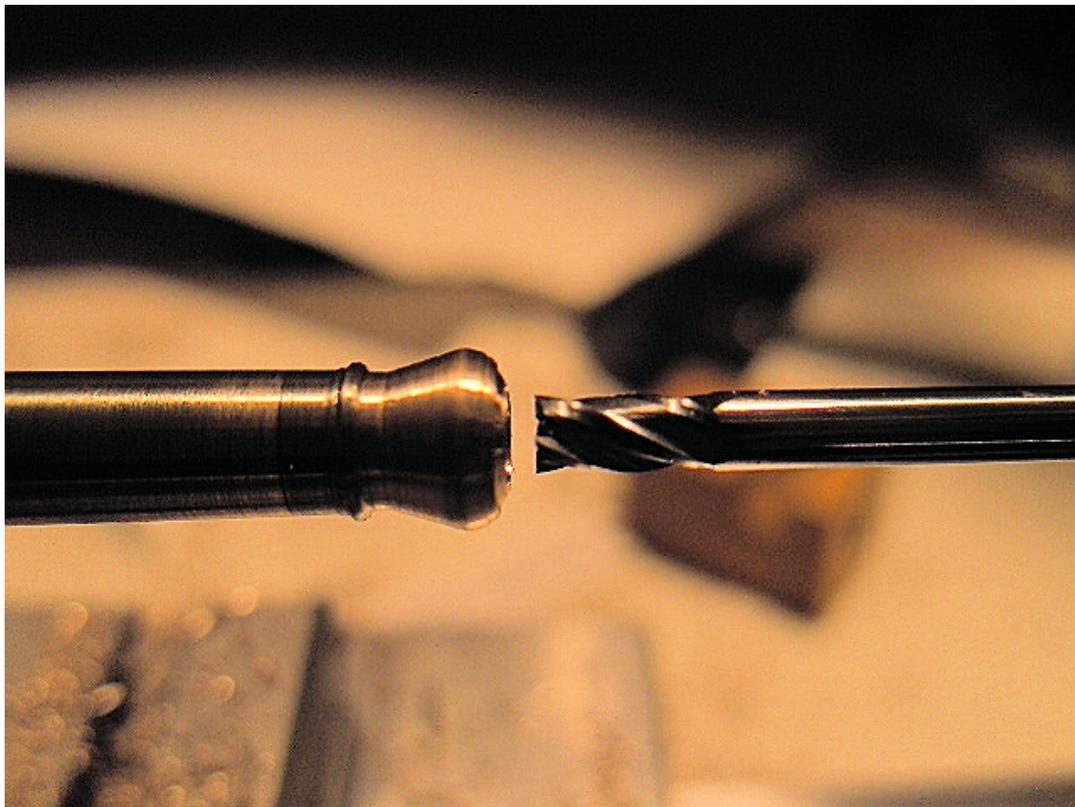
Now its time to move back up front. We want to finish the work up here before the metal gets to thin and loses what rigidity it has in the back.



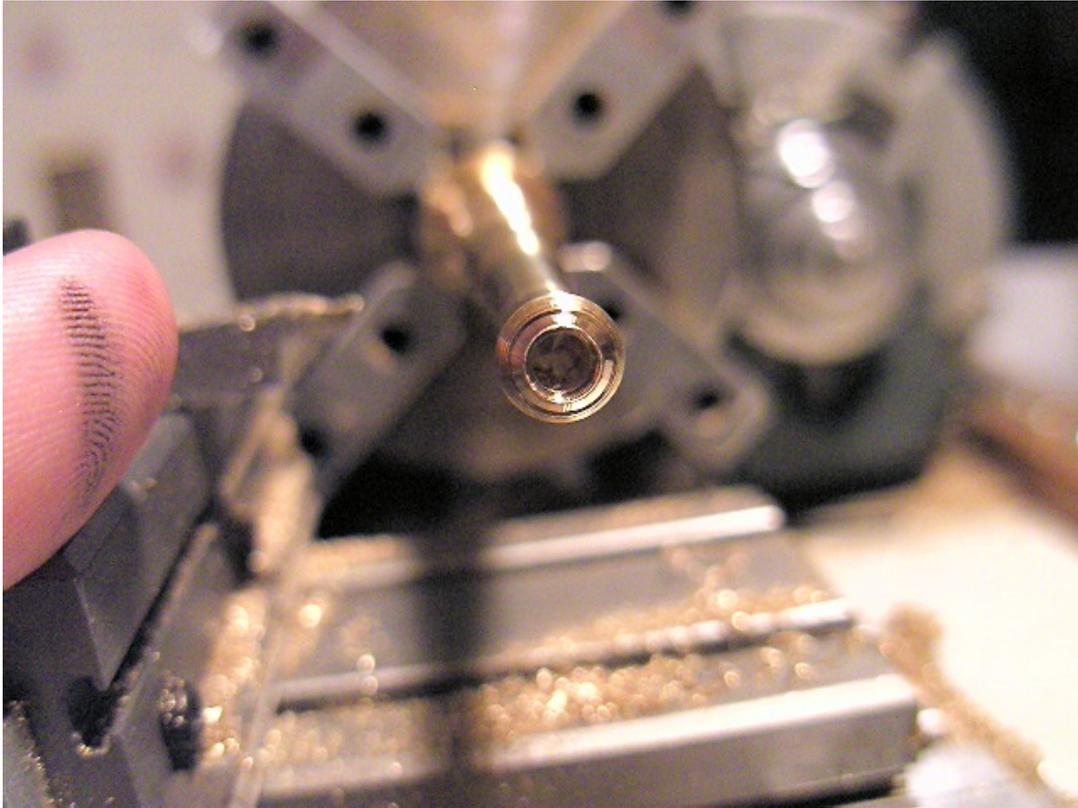
Finally, the tiny turning tool in use, I will use this for all parting work. I move it side-to-side and slowly open up and remove metal. At this point I remove the dead center.



Here is the parting and I moved the center back up for this shot. Some people don't like to leave the extra material I do at both ends-this picture explains my reasoning. Once the center is inserted into the work, you obviously cant see it. By leaving the extra material I never run my bit into the tip of the center- now THAT will dull the bit.



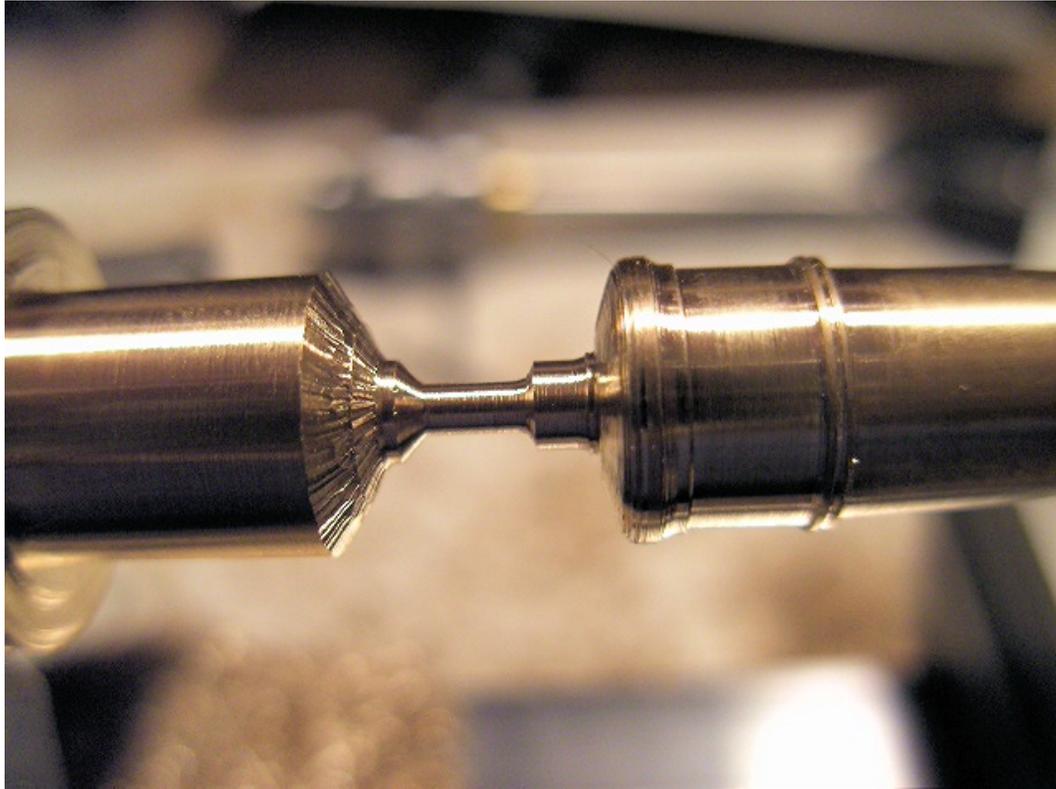
Here is a very bad picture, but it shows a 1/8 inch end mill being used for the boring of the muzzle.



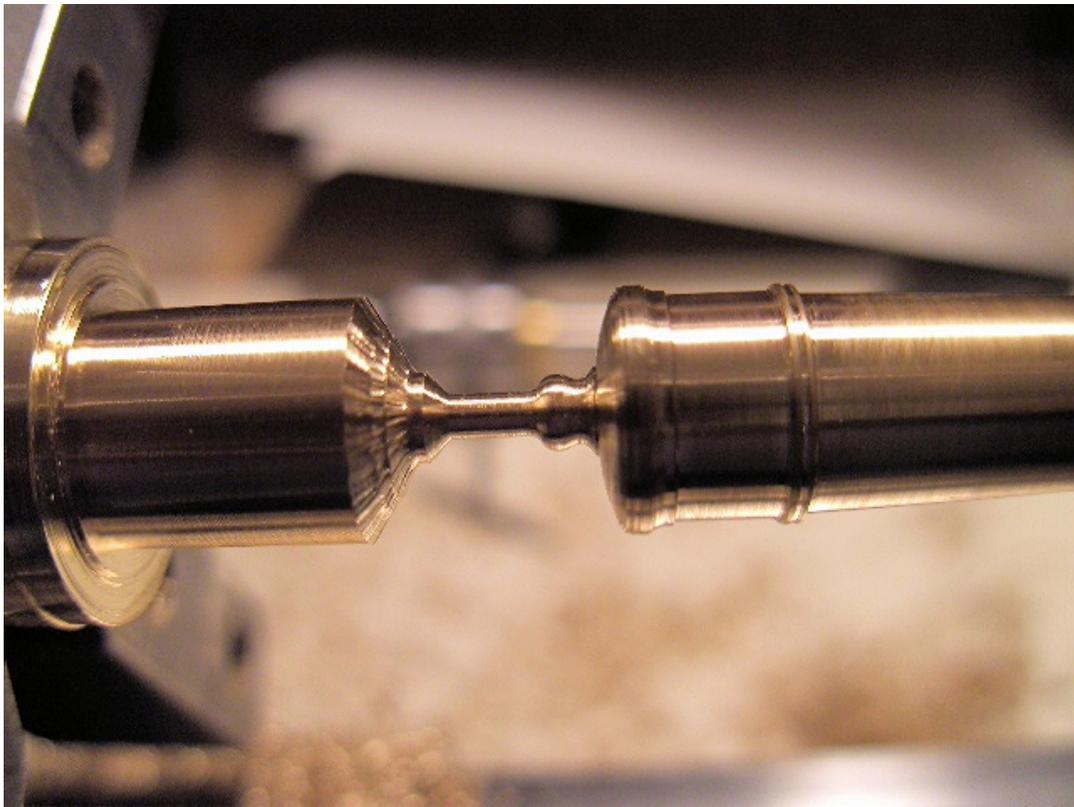
A good clean bore, remember this is only for making a mold, or I would have bored in much deeper. This is deep enough to fit a pouring vent.



Now the live center is back in the work, I don't want to mar it up by using the dead center. I lost some of the set-up rigidity now, that's why I did all the work except the button and the complete parting off before I did this.



Back to the cascable, you can see all the moldings clearly-I hope I don't lose these when I cast the canons. Now it's time to shape the "button".



Using the same technique you did for the bell, here's what you get. Also notice the bad habit marks on the left.



Here I am going to do the final parting. EXTRA cloth for protection and no center in site. Now before you do the final parting, do any additional finishing you want to. You can use fine files if you have to refine some of the shapes. You can also use sandpaper, start with 600 grit and finish off with 1000 grit. **Be very careful doing this.**



Here it is, and I am happy with how it turned out. All it takes is practice.

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