Mushroom Box With Hand Chased Threaded Lid

Introduction & Thoughts on Design:

Before attempting to use this handout to turn a mushroom box with a hand chased threaded lid, I would suggest that you read over the handouts on *"Turning Mushrooms"* and the Handout on making boxes titled *"Notes on Lidded Boxes"*. The focus of this handout will be on Hand Thread Chasing and will not cover in detail the making of the box. If you have not made a box or a mushroom for that matter before go ahead and use the handouts listed above to turn a practice mushroom box. Once you feel confident enough to turn a mushroom box then you will be ready to turn one with a threaded lid.To properly chase threads a very dense hardwood is needed. The best wood for chasing threads is English Boxwood as this wood is very expensive and hard to find, one can fairly easily chase threads in Dogwood or some of the other exotic woods such as Cocobolo and Ebony, although they too are a bit pricy. I have had great success with using Dogwood for my threaded boxes. I have also had some success using Bradford Pear. I highly recommend reading Allan Batty's handbook on woodturning titled *"Woodturning Notes"* available through Craft Supplies Woodtuners Catalog especially the chapter on chasing threads. I would also recommend watching Allan's DVD titled *"Hand Thread Chasing."* In this handout I will describe the tools used and some tips on how to choose the right set of thread chasers. I will also cover various techniques to improve your thread chasers and tips to help make turning a box with a screw on lid much easier. Most of the tips that I am sharing I learned from Allan Batty and can be found in his DVD on Hand chased Threads.

I will do my best to explain how I chase threads and maybe provide you with a few helpful tips. Threaded lids can be used in a wide variety of projects. Many turners use threaded inserts to create threaded lids for projects that are made from woods that are not suitable for hand chasing threads. The inserts can be turned from hard dense woods or some other suitable material. Thread chasing can be fun but requires a bit of rhythm and timing as the cutting tool moves in sync with the speed of the lathe, the speed of the turning and the travel of the thread. The most important thing to remember is that the thread chaser is always in motion, going from side to side and rocking into and out of the cut as the thread is chased. The lathe used for thread chasing must be able to rotate at somewhere between 250 and 500 rpm's maximum. Most of us can chase threads at around 300rpm's. It is a bit more difficult to keep up with the lathe speed set to 500rpm's. Stay relaxed and amaze your friends.

Thread Chasing Tools

Relief Cutting Tool

Materials:

Set of Thread Chasers (Allan Batty's Signature Chasers size #20 recommended)

(Available from Craft Supplies Woodturners Catalog)

These chasers may need to be ground down a bit and modified to work properly
Arm Rest
Relief Cutting Tool (this tool may need to be modified or reshaped)
1 ¼" Spindle Roughing Gouge
Thin Parting Tool
¼" Parting Tool
3/8" Spindle Gouge
½" Round Nose Scraper
3/8" Box Scraper (optional) Allan Batty design
Suitable Wood English Boxwood preferred but dried Dogwood will work
Four Jaw Chuck
Lathe that will turn at slow speeds of 300 to 500rpm's

Mushroom Box roughed out with tenons on both ends

Procedure:

1. Mount the blank between centers and rough turn your box with a tenon on both ends so that the top and bottom can be mounted in the chuck to hollow the box bottom and the lid.

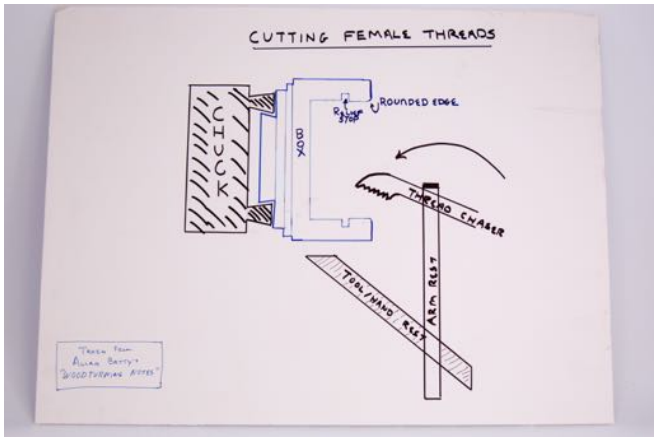
Note: A trick Allan Batty uses to line up the grain of his box after chasing his threads is to draw a line on the outside of the box across where the joint for the top and bottom of the lid is, that way he can later just line up the line by removing a bit of the female threads or better yet remove some of the shoulder on the section of the box that has the male threads.

2. Decide which end is going to be the top and which end will be the bottom and begin shaping the mushroom box. I usually turn the female threads in the mushroom top. Remember to leave the bark edge on the lid or top section's rim. Do not fully shape the outside of the mushroom box as there needs to be enough wood left between the box and the chuck's tenon to support the parts, so that they can be hollowed and the threads chased with very little or no vibration. Also remember to leave enough room for the tenon and the mortice and the waste area where the lid will be separated from the bottom.

Note: Generally the female threads are in the lid, which means that the lid would be left in the chuck and the bottom of the box would be parted off after a line has been drawn to help register the grain pattern when the lid and the bottom are put together.

3. Once the box is rough shaped, separate the top and the bottom with the thin parting tool.

4. First hollow out your box lid, be sure that the top mortise where the threads are going to be chased is perfectly parallel to the side of the box which would be parallel to the ways (bed) of the lathe. An easy way to check to see if the side of the box is parallel, is to rest the side of a pencil inside the box and look to see if it the pencil is parallel to the bed of the lathe. Better yet use a pair of inside calipers to check that the sides are parallel. Leave the sides thick enough to compensate for the threads and be sure that it is small enough for the bottom to fit in. Using a parting tool or the box scraping tool make the inside of the sides for the female threads perfectly parallel about a ¼" to 3/8" into the inside of the lid.



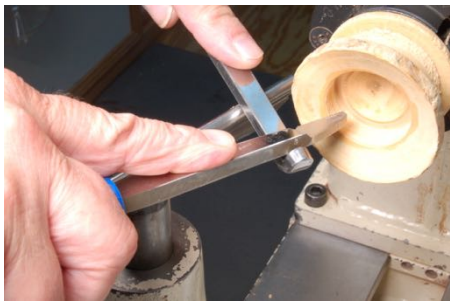
5. Once the area for the female threads is trued up parallel and straight, cut a groove or recess approximately 1/8" deep behind where the threads are to stop. The relief enables the chaser to stop before bottoming out and thus eliminating or wiping out your threads. The front edge of the area for the threads should be rounded over a bit to make it easier to start your threads. Set the hand rest at an angle away from the box lid to provide room so that you can use the thread chasing arm rest as an aid in the chasing threads.

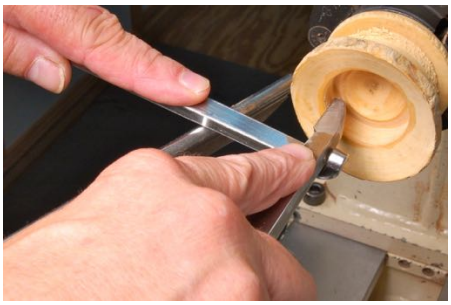
Note: I use a relief cutting tool that has been slightly modified to cut a small relief at the end of the threaded section. The tool has been modified by grinding the tips cutting edge to make about 1/8" wide groove and to insure that the cutting edge is in line with where it is supported on the tool rest. This is done by grinding the area behind the cutter at an angle to relieve the steel directly behind the cutting edge see photo below.

6. The front edge of the area for the threads should be rounded over a bit to make it easier to start your threads. Set the hand rest at an angle away from the box lid to provide room so that you can use the thread chasing arm rest as an aid in chasing threads.

Note: The easiest and most common thread sizes to use are 16,18 and 20 threads per inch. You will need to get a matching set of thread chasers. They will have to be adjusted to work properly. The first thing to do is to check to see if that the chasers start with a full tooth. If not grind away the half tooth, so that the chaser starts with a full tooth. Another trick or adjustment which makes the tool much easier to use and allows it to get into small boxes is to grind down the top to about half its' original thickness. When sharpening only grind the top surface never ever touch the teeth. Touch up the sharpness of the tools by honing the top edge before each use. Once your tools have been modified you are ready to chase threads. Allan Batty once told us that thread chasers work best just before they are worn out and useless.

7. To start your threads begin with the tool at a 45 degree angle and slowly matching the speed of the lathe bringing the tool around in sink with the motion of the lathe, rocking the cutting edge up and down and side to side, making sure not to cut with the lead tooth until the threads are established giving it a place to ride. Once the threads are established, you can let the lead tooth follow the threads until they are cut to final depth. Be sure to pull the chaser out when it reaches the recess or groove so that it does not stop and wipe out your newly chased threads!





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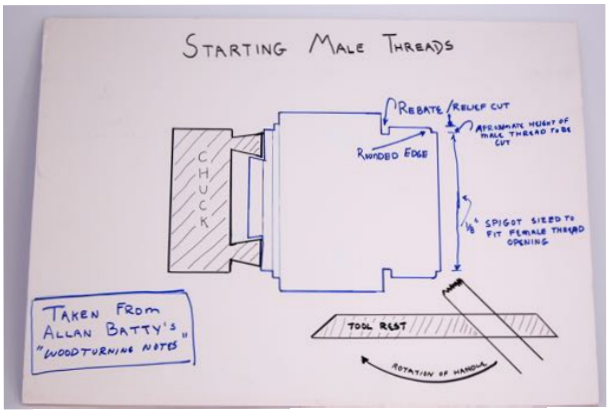

8. We are now ready to mount the bottom of the box in the chuck and turn the male threads to fit the female threads. It is a good idea to start to hollow some of the interior of the box before chasing the threads to relieve a bit of the tension in the wood. Be sure not to hollow the box too much as you will need to leave plenty of wood to support the threads.

9. Next turn a 1/8" long tenon to just fit inside the female thread. This establishes the top of the male the male threads. Now part down where the threads are going to be, leaving enough wood for the depth of the threads.

10. Once again round over the leading edge of the soon to be male threads to make it easier to start the threads just as was done for the female threads.

Note: Applying a touch of paste wax to the threads will help make them easier to turn. Allan Batty suggested mixing up hand dishwashing liquid and Rubbing Alcohol and applying the mixture to the threads to aid in chasing the threads.

11. Again start the threads at an angle to the tenon and bring the tool around in rhythm rocking it up and down and side to side as you begin to chase the threads. Once again do not cut with the lead tooth until all the threads are cut. Then let the lead tooth follow the threads until the threads are cut to the depth of the chaser's grooves.

Begin chasing the male threads with the tool starting at a 45 degree angle

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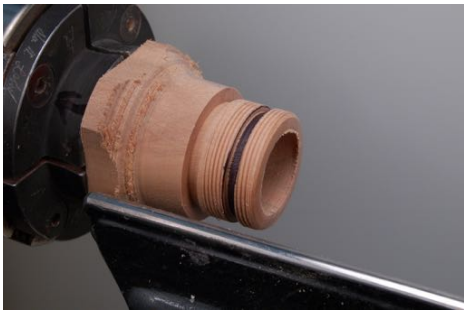
Work the thread around until male thread chaser is parallel to the tenon then finish cutting the male threads

12. Next ease or round the first thread so that it will not get torn during use, by using a round nose scraper.

13. Now it is time to line up the pencil line and adjust the threads until it lines up.

15. To adjust the fit it is easier to remove a bit of the shoulder on the male threaded section of the box until the top and bottom line up with the grain or the pencil line. Once finished screw the parts together and enjoy your new mushroom box.

Note: check out Allan Batty's DVD on Thread Chasing and Allan Batty's "Woodturning Notes" available from Craft Supply's Woodturners Catalog



**Note: You can also chase a series of female threads then part them off and insert then into a mortise in the lid of a box or the base of a Hollow Form and then chase a series of male threads part them off and insert them onto a tenon in the bottom of a box or the lid or finial on the top of a Hollow Form to make threaded parts for woods that do not take to thread chasing very well.*