# THREE WINGED VESSELS

## Part A

Probably the hardest part of three winged bowls is getting a perfect cube. Once you have that mastered, the rest is fairly simple and straight forward. Mount opposite corners of the cube, one in the lathe headstock and the other end in a cup center on the tailstock. Tighten quill securely holding the cube. Since no chuck is being used at this time, there is very little concern with the cube going airborne. As you can see, this is probably the strongest means of holding a piece of wood. Bearing in mind that you are using a blank of sound structure. And this is almost self centering.

Turning on the lathe and bringing it up to a safe operating speed, you will notice two ghost areas appear. One will be left of center and the other right of center of the cube. Turn off lathe. Move tool rest very close to the cube. Rotate cube by hand, stopping one of the left of center corners at the tool rest. Using pencil, marker, chalk, etc. mark the tool rest at the nearest point of the corner. Rotate cube to assure the other two corners fall at the a mark on the tool rest. If all three corners match up to the mark, your cube is ready for turning. If corners do not match, you may have to remove the cube and rotate to other corners or reform the cube.

With a very sharp bowl gouge, start carefully turning off the right ghost. Be sure to keep tools, tool rest and hand clear of the rotating left corners. Once you are about half way through the right ghost, stop the lathe and look at how much wood is left. Now is a good time to turn your chuck tenon. Depending on how large a cube you start with, will determine the size the chuck jaws must be to allow for making the largest possible bowl from the cube. Read that again.

Turn a tenon that will match the jaws on your chuck. Since we are dealing with a corner of the cube, the tenon must be cut forward enough into the cube as to leave at least 1/4" of wood showing all the way around the tenon. Next trim the remaining wood down between the tenon and tailstock so it will fit up inside your chuck as this end will be used later when reversed on a jam chuck. Remove cube from lathe.

Mount your chuck and place cubes tenon in the chuck. Snug up chuck jaws, bring up tailstock and place corner of cube in cup center. Snug up quill onto cube while tightening the chuck. Check for trueness. Go back to the mark on the tool rest and assure that the corners still match up. I can generally get by with a 1/16th variance on the corners if making a bowl. Tighten chuck and quill. Check again.

AT THIS POINT, it is the time to decide if we want to continue turning a bowl or a lidded box. In either case, turn another tenon on the right side. I have had lidded boxes turn into nice bowls due to an operator error. All is not lost, you have a box or a bowl.
For a lidded box go to part B .

Continue turning the outside to the desired contour. Beware the chuck with tool, and knuckles. TIP: the more up the right corners the cut, the higher the wings, but the smaller the bowl. Make some cubes and practice different profiles.

For the bowl, carefully start hollowing. Remembering to avoid the spinning wings, and keeping the tailstock connected. As you are turning the inside you will notice the curve of the rim taking shape. Personal preference and skill will determine how thin to make the rim. Remember that the thinner the more chance of tear out, especially on softer less dense woods. I will sometimes run a line if CA along the rim edges to help prevent tear out.

Working your way into the bowl, picking up a cut on the wings to continue thinning the rim. Once the wings are thinned to desired thickness, you will have to pick up a cut the deeper into the bowl to continue the rim thickness. Once into the bowl, it will get to a point to part off the connecting tailstock support. And too, the size of the bowl will be a factor when to get the tailstock connection out of the way. You may part off as deep into the bowl as possible going at an angle toward the interior of the bowl. When about to 1/4" of wood is left, remove tailstock and gently, holding the bowl section, twist off the excess wood section that went to the tailstock. Since this has a tenon, it may be used as a jam chuck later. When the inside of the bowl is turned to your desired thickness, sand as with any other bowl.

## Part B

To turn a lidded vessel. Making a lidded box becomes a tricky task as we have three wings spinning at the same level or higher than the lid will be, and we have a limited amount of wood on the box portion. Make sure you put the tenon on the lid portion as in part A.

With a thin parting tool, make a diagonal cut slightly below the wing height. Carefully avoiding the wings. When the lid portion is parted off, flatten the box lip as this will be the the fitted portion for the lid.

Drill a hole for the hollowing depth before removing from chuck. Make sure hole is straight by checking edges with a parting tool removing a small amount of wood. This hole will aid in aligning the box back in the chuck to continue hollowing. Remove the box from the chuck.

Install lid portion in the chuck firmly pressing wood against jaws as you tighten the chuck. With calipers, calculate the size of the lid by measuring the earlier flattened area on the top portion of the box. Once size is determined, turn the tenon that will fit into the box to 90 degrees, with about 1/8th to 3/16s tenon length. Finish underside of lid, sand to desired finish. Remove from chuck.

Place the box again into the chuck. Align with the tailstock, using the previously drilled hole to assure the box turns true.

It's time now to fit the lid to the box. Making small cuts to the box opening, and checking often not to over cut box opening fit the lid to the box. The lid cap should be smaller than the mouth if the box. This will allow to blend the box to the lid with an almost invisible intersection line. Place lid on box and bring up tailstock. If lid is loose, use a paper towel to get a tight fit between box and lid. Turn the inner portions of the wings and the box top, blending in the cuts. Continue working your way down wings to a uniform thickness, at the same time making an acceptable transition to the box top and lid. Care should be taken not to cut away all of the lip on the lid.

Remove lid and hollow box to desired thickness. I usually keep the wall thickness to the same thickness as the wings. After hollowing, replace lid. Line up grain pattern if applicable. Shape lid down, removing most of the remaining tenon. Sand to desired finish. If lid is not tight enough add paper towel and tape to hold lid to the box. Cut remaining wood to 1/8th inch. Remove tailstock and with a parting tool cut the last of the 1/8th inch cutting inward toward the lid.

Using a Jacobs chuck, drill an 1/8" hole in center of lid, taking care no to drill through the lid. This will be to mount a finial or knob later. Remove lid from box, and remove box from chuck.

Using scrap wood make necessary fitting to clamp in your chuck. Turn the wood down and square off the face. Turn another tenon on the face of the scrap that will fit snugly into the box opening. The tenon should be just short enough to where the rim will bottom out on the scrap. This is a fitted jam chuck. All edges and shoulders should be square and flat. You will have to take your time cutting small amounts of wood to get a tight fit. It's just like making and fitting a lid. Place the box on the jam chuck and check for fit . If too loose, add a paper towel layer until tight. Bring up tailstock and lock in place. Notice that you have prior marks on the wood that makes it easy to align. Once pressure is added from the tailstock, use strips of painters tape to help hold box to jam chuck.

With a thin parting tool, start forming the base of the box, working at an angle toward the center. Leave about 1/2" length of wood between the bottom of the box and the remainder of the wood going into the tailstock. Trim this carefully down to about 1/8". Stop the lathe and cut the remaining stem between the box bottom and the wood going into the tailstock with a fine cut saw. Trim the remaining part of the stem with a carving gouge or knife, taking care to not break the stem off at the base of the box as sometimes it will pull grain out with the break. With the box still on the chuck, assure there is still a good tight fit to the jam chuck. If not, add more paper towel and retape securely. With a round end scraper clean up the bottom carefully taking light cuts using a slight forward pressure. The tailstock can be brought up with a protective tip (drilled golf ball) if more sanding or finishing is needed.
Have fun and turn safe.

FINIAL ANATOMY

The "HOW" in The HOW TO of turn elegant finials
by Jim Creel

There is nothing that will adorn a lidded vessel more than a finely turned finial. You can see that for yourself by closely studying the gallery pieces displayed at symposiums, in gallery's,and magazines. Fig. 1.

Having a positive interest in learning to turn thin delicate finials, I took a hands on class with Cindy Drozda. She was very kind to me on critiquing my gallery pieces brought to the class. To say the least, I needed help and being left handed didn't help. I was breaking every finial I tried to make in the class. By the end of the class, and a stubby fat toothpick as a finial on my lidded box; Cindy said, maybe you should learn to turn right handed. But I took what she showed me and practiced over and over. And that's what this demo is all about. How and what to practice to be able to turn a thin elegant finial.

Now just what is a finial? A dictionary definition,( among other definitions ) describes a finial as an ornamental terminating point. This definition seemed more fitting for our particular needs.

When deciding the size and shape of the finial I'm placing on a designated piece, I want to take into account the overall appearance when finished. Most turners when making bowls, hollow vessels and lidded boxes, use the golden mean ratio to their turnings. This 1.618 to 1 ratio is all around us in nature and has been applied to many objects for thousands of years. The reason for this, is that it is pleasing to the eye. You can also use the rule of thirds to simplify these measurements. My preference for applying a finial size to a vessel is to make the finial height the same as the width of the vessel it is going to be placed on. To do this, I measure height and width of the vessel. Then on to the sketch pad, drawing the completed piece with different finial designs and heights along with the size and height of the base or foot. Also in designing the finial, I once again apply the golden mean, or simply the rule of thirds, to all the elements of the finial. Sometimes with a very large vessel, the finial would be extremely high, so, I go back to the thirds idea and make the finial one third or two thirds the vessel width. I try to imagine a tall thin tapered spire rising from the bottom of the base through the vessel and ending at the finial tip. Each cove that is cut into my base and finial is cut equal to the diameter of the spire as it continues through the base and finial. I feel that this gives a look of symmetry and balance. It's like seeing the graduating spire going through the entire piece if held against a light and looking at the silhouette of the whole completed piece. Now, this is only one example of the hundreds of combinations to be had to create a well balanced work. Fig. 2.

TOOLS FOR FINIAL WORK

1. 3/8" bowl gouge for removing bulk of wood
2. 1/2" spindle gouge
3. 3/8" Drozda spindle gouge for fine details
4. Drozda vortex tool for very tight and tiny cuts
5. Thin fluted parting tool

Both my spindle gouges have approximate 20 degree bevels. I grind off most of the bevel going up the shaft leaving about 1/32" bevel to the cutting edge. This allows for deep thin clean cuts. The reason I use the Drozda tools is that they come ready to use, ground and sharpened. And I like them. Fig. 3.

The material I use to practice is a 3/4" dowel purchased at hobby lobby. I think maybe its birch, but not sure. I have used oak dowel, but they can be iffy at 1/16 diameter. I go through the box of dowel and pick out the ones with long straight grain with very few terminating grain on the sides. I get six pieces from a 36" dowel. This is great practice wood as it is not very forgiving and makes you concentrate on taking your time.

On the subject of wood. The woods that is used for the majority of my finials are African blackwood, rosewood, ebony, pecan, persimmon, and purpleheart. I just try to match the finial to the turning.

I like to use a collet chuck to hold the 3/4" dowel. I can drive the dowel into the chuck leaving only a few inches exposed for turning which gives great support for turning small work. As I use the wood, I can loosen the collet and with a knock out tool, tap out some more wood. Fig. 4.

Practice exercises are necessary to produce perfection. Where have I heard that before? Your parents, your teachers, your wives told you, and you probably have told your kids. Practice makes perfect.

The first practice exercise is to make a 1/16" dowel out of a 3/4" dowel, or commonly known as a toothpick. Because, because the size of the finial may be the size of a toothpick. Don't just turn one and say, OH I HAVE THIS. Make enough to gain the confidence that when this is a piece of expensive ebony that you can turn the finial without concern. When making this small diameter piece, it will be necessary to support the wood with your fingers to prevent snapping.

The next practice is to turn small round balls. Round ball after round ball. Make a rosery. If you make enough balls for a rosery, you've got this step down.

Now turn an olive on a toothpick. Do enough to fill a martini glass. Color one side red just for fun. The only

difference from an olive on a toothpick and a finial, is the ball will taper out to make the finial. Practice that too.
Next, lets work on turning small disks. Turn tiny disks, small disks, medium disks and large disks. Turn several of each in a row, then alternate diameter small to large, large to small, just make a bunch of each. Once you have practiced making the disks, lets now make disks with nice sharp edges. What's that? Who said 100 grit? Nah! We're going to us our spindle gouge. To get that sharp edge, we need something for the gouge to start the cut on. Make a small flat on the disks edge with the gouge on the disk edge that will allow enough room to make that final cut and leave a sharp edge on the disk. Fig. 5.
Now lets do some spindle work. We are going to turn some beads and coves. Some thin beads and tight coves and some long tapered beads and long coves. That's all a finial is: small spindle work.
We will only be removing enough wood as we go to complete and sand each step.

1. First cut is a cove for the tip
2. Next a thin disk ( bead )
3. A very tight cove
4. A smaller ( or larger ) thin disk
5. A long sweeping cove
6. A long tapered bead
7. Another tight cove
8. A small disk
9. A smooth flowing cove
10. A large disk with slight bevel on the rear.
11. Part down to create a 1/8" tenon, then part off.

Fig. 6.
Sandpaper is the final cutting and shaping tool and must be done at each step through all your grades of paper. Once you have finished a step, it is not likely you will be successful going back and sanding as the piece is thin and delicate and breakage is probable. I read that somewhere.

Take your time, practice diligently and take your time, practice diligently and take your time and.....Before you know it, you will be turning beautiful delicate finials.

# MAKING USEFUL THREADED CHUCKS

By Jim Creel

Let me begin by explaining the usefulness of making your own threaded chucks. From cone sanders for rounding the holes in sea urchins, hones for polishing a razor edge on turning chisels, sanding disks of any size, sharpening disks, jam chucks, to faceplates for vacuum chucking. The list can go on and on for the multiple uses of creating your own threaded chucks.

## SELECTING THE RIGHT WOOD

Most hard tight grained wood can work for the purpose of threaded chucks. I've used hard maple, bubinga, rosewood, and pecan. My preference for quick inexpensive chucks is hard maple, especially for a custom or one time usage chuck.

## TOOLS NEEDED

A quality hardened tap, the size for YOUR headstock threads.
A forstner bit, 1/8" smaller than the tap size.
A wrench to turn the tap. I use a 3/4" open end wrench.
Thin CA glue and accelerator.
Gorilla glue ( just my preference ) .
MDF board ( for face plates).
#10 sheet metal screws. I generally use 11/2"-2" length.
Counter sink bit for #10 screws.

Both my JET and POWERMATIC have 11/4" threads on the headstock. So for ease of demonstration purposes, the size tap and forstner bit will be used to accommodate my lathes. Remember, you MUST use the right size for your particular lathe.

For this demo,I'll be using a 6" hard maple square 2" thick.

STEP 1: With a compass, scribe a circle on the wood making a heavy indention with the compass point in the center. Using a band saw, cut the circle. Fig.1.

STEP 2: with a 21/8" (or larger) forstner bit, drill a 1/2" deep hole in the center of wood circle as this is the recess for your 50mm jaws (or larger). Fig. 2.

STEP 3: Mount chuck on lathe and wood onto chuck in the recess you just drilled. Make sure jaws expand firmly into the recess. Turn true the round outer edge and flatten front face then flatten the rear face up to 1/4" of the chuck.

Step 4: With a 11/8" forstner bit mounted in a Jacobs chuck, slowly drill through the entire piece of wood. This allows the threading process to cut far enough to pass the taper of the tap. For making jam chucks, cone sanders etc. where a large block of wood is used, a 2". Hole is sufficient. Fig.3.

STEP 5: Cutting the threads: This process can't be rushed, so take your time cutting the threads. Note in the picture the center punched divot in the rear of the tap. This is convenient to bring up a live center in the tailstock to keep tension on the tap, and, most of all to keep the threading process perfectly aligned. Fig.4.

Ease the tapered end of the tap into the prepared hole and bring the tailstock aligning the live center.point into the divot. Tighten the tailstock in place, and crank the live center until the cutting threads of the tap make firm contact with the wood. Give a quick check that everything is squared up. An easy way to do this is to spin the piece by hand. If ok, make sure chuck is tight on the lathe, Allen screws tightened to drive shaft. Now, rotate block until you find an index notch and lock in place. This holds the wood while threading. I use a 3/4" open wrench ( that's what fit ) to start turning the tap clockwise, all the while cranking to keep pressure on the tap from the live center. Every couple of turns clockwise, you need to turn back counterclockwise to clear the saw dust from the cutter teeth, and to keep from binding. Once you have cut to a point where the teeth are no longer visible or tap has bottomed out, unlock the tailstock. Using the wrench, start slowly turning counterclockwise to back out the tap. Some high pitch squeaking may occur.
As the tap backs out, it will be pushing the tailstock to the rear. By keeping the divot on the live center point as it backed out of the wood, it reduces the chance of messing up the new threads. Carefully remove tap and set aside. Blow shavings from the hole.
Now by hand rerun the tap through the newly cut threads and back out again. BE CAREFUL THE CUTTER IS SHARP. If it is difficult to do by hand, bring up the tailstock and repeat above procedure. Blow out any remaining shavings.

STEP 6: Some lathes require an extra large opening of 1/4" deep by1/4" wide. That's 1/8" on each side. Make this opening with a skew or gouge and once again blow out shavings. Fig.5.

STEP 7: Unlock spindle, using thin CA glue, coat the threads liberally while rotating by hand allowing glue to flow and soak into the threads. After a short while, spray with accelerator to make glue is set. Fig. 5.

STEP 8: Repeat the cutting process as in step 5 to remove excess CA. Blow out residue from threads. Repeat step 7 then step 5 if making vacuum chuck or jam chuck. This will better harden the threads.

STEP 9: Remove wood from chuck and chuck from lathe. Screw the wood chuck onto the lathe and assure snug fit all the way to the back of the shaft. Finish turning the face flat and true.

STEP 10: Cut a round piece of MDF to us as a face plate. The diameter of the faceplate is determined by the intended use. In as much as the diameter of the wood chuck is determined by its intended use. Larger wood chuck for larger faceplate.
Once the MDF is cut, apply gorilla glue to the front of the wood chuck staying about an inch from the center to allow for expansion of glue. Press MDF against chuck, bring up tailstock and put point of live center in the center of the MDF. ( there should have been a mark left from the point of the compass when scribing the circle ). Tighten the tailstock and crank the live center firmly against the faceplate. Spin lathe to check trueness. If it looks good, tighten crank more and allow glue to set. You can always do a dry fit first to check for trueness. This will give you another chance to true the face up. Fig. 6.
After a few hours of drying, drill and countersink holes for the #10 screws. Install screws making sure the heads are below faceplate surface. For a small faceplate used for sanding or polishing, two screws are sufficient . The larger the faceplate the more equally spaced screws should be used. Once glue has dried at least over night, slowly run lathe to double check faceplate spins true. If not, turn true.
Now depending on the size and purpose intended, decide what material to adhere to the faceplate surface. Closed cell foam for vacuum chucks, self stick sandpaper for disk sanding, leather for a strop etc. Fig. 7.

There you have it. Let your imagination run wild with the many uses for threaded wooden chucks.
Enjoy