

Turning a Suspended Bowl

A Pictorial Article by Bob Hamilton

A square bowl which has corners that turn down and extend further down than the bottom of the bowl so that the bowl will rest on its corners with the bottom "suspended" above the tabletop is what I call a suspended bowl. I don't know if that is the correct term for this form but it is what I call it. :) A friend had been having some trouble getting one to turn out so he asked me for some pointers. It had actually been a few years since I last turned one so I decided to refresh my memory and get some pictures to help in explaining.

I started out by selecting a piece of suitable stock. Not all wood species are suitable for this form, because the thin downturned legs will have short grain areas that will chip out badly on wood that is brittle or coarse grained. Some chip out on the edges is pretty much inevitable no matter what wood you use, but minor chips can be dealt with relatively easily. Large chips are more difficult to handle, especially if they occur at the end of one of the legs. Avoid bold, open grained woods like oak or ash in favour of species with a tighter grain, like hard maple, which is what I used for this one.

Note: Please ignore the Oneway bowl steady in the background of the pictures. It is in its "parked" position behind the headstock and is NOT in use for any part of this project.

I had an 8/4 board of hard maple that was about 8 3/4" wide so I cut a piece off the end and squared it up on the table saw. I found the centre and bored a 3/8" hole for my screw chuck. I oriented the annular rings so that the face of the board that was toward the bark when the board was part of the tree would become the top of the bowl. I don't know how much it helps but it seems to me that if the annular rings in the end grain of the blank sort of follow the downward droop of the legs it will minimize the short grain in the legs.



Photo#1: Blank prepared for mounting



Photo#2: Face dressed and toolrest moved.

After dressing the face of the blank flat I swung the toolrest around and started working on what will be the outside face of the legs in order to establish the width of the feet. On the whole this maple cut quite well but I did have one nasty chip come out right at the bottom end of one foot. If I were to remove enough material from the corner to get back past the chipped out area the foot would be way too wide and there would be no guarantee that I wouldn't have another chip while cutting it back, so I will leave it for now and deal with it later.



Photo #5: Shaping complete



Photo #6: Corner sanded

Once I had the corner rough shaped I used my side ground bowl gouge in shear scraping mode to fair the curve and then sanded the outside of the legs to 400 grit.



Photo #5: Shaping complete Photo #6: Corner sanded

I applied a bit of my beeswax/mineral oil finish to the area that will become the rim of the bowl in hopes it would soften the fibres a bit and reduce chip out. If I had been planning to use Danish Oil as a finish I would have used that. Sanding sealer might work by binding the fibres together, but I have never tried it for that purpose. I moved the toolrest around and began working on the bottom of the bowl. The first step was to excavate some material and form a tenon to mount in the chuck when the bowl is reversed. I then started to shape the underside of the legs and the bottom of the bowl. The cuts on the underside of the legs are made towards centre while the cuts on the bottom of the bowl are made away from centre, so you need to keep working both areas to give the tool room to advance



Photo #7: Tenon cut Photo #8: Working the bottom

You need to get the legs cut to their finished thickness as you go since they will become flexible and you won't be able to eliminate chatter if you get too far ahead on the depth before trying to cut to finished thickness. Stop the lathe frequently to check your progress. In Photo #10 I have actually reached the point where the rim is fully developed, but there is almost no lip between the rim and the bowl wall. If I were to stop there I would not be able to remove that nasty chip from the bottom of the one foot without screwing up the rim shape so I continue the curve of the underside of the legs until I have a lip of about 3/8" between the rim and the bowl wall.



Photo #9: Rim shape developing Photo #10: Almost there

In Photo #11 I have made my final pass down the bowl wall into the undercut area and left a small ridge right in the corner. To clean it up I used my side ground gouge with the flute rolled right over to almost the 3 o'clock position and the gouge horizontal. I picked up a very light cut in the undercut area of the rim and cut toward the bowl wall. As the point of the gouge reached the bowl wall the lower wing began to shear scrape on the bowl wall and I withdrew the tool in a light shear scrape up the side of the bowl. That left a nice crisp corner.



Photo #11: Rim lip established. Photo #12: Turning complete on bowl bottom

Now I have to deal with the chipped out foot and any other areas that have chipped out. It only took a couple of passes with my spoke shave on the end grain edges to clean them up, but the long grain edge that had the nasty chip required planing off about 1/8" to get a clean surface. That would have left two legs noticeably wider than the other two, so I planed a similar amount off the other long grain edge. A word of caution here: the area under the rim is undercut and hand planing the rim will leave the lower edge of the rim extremely sharp, especially on the long grain edges. Use a piece of 150 or 240 grit sandpaper to ease the sharp edge and fair out the curve if it needs it. (Fortunately I didn't get any blood on the wood. :)) With the edges cleaned up I proceeded to power sand the bowl bottom and then shut the lathe off and hand sanded the underside of the legs.



Photo #13: Ready to clean up the Edges
Photo # 14 edges cleaned and bottom

I now reversed the bowl and mounted it on the tenon. Hollowing the bowl is pretty much the same as hollowing any bowl.



Photo #17: Bowl inside sanded
Photo #18: Rabbet cut and bowl removed from lathe

I decided to use cherry for the lid since I had a 5/4 board that was wide enough to make the lid disk in one piece. There was a fair amount of sapwood on one face of the board and I chose to make it a "feature". I cut a disk about 1/2" larger in diameter than I needed. Since the board had a fair amount of cup in it I clamped the disk down on my workbench and hand planed a flat area for the face of the chuck jaws to seat against. I will be using my #1 jaws in expanding mode to mount it on the lathe so I bored a 1" hole about 1/2" deep in the centre of the face that will become the inside of the lid. I mounted it on the chuck and dressed the face flat and trued up the rim, then cut a recess in the centre for mounting it when I reverse it.



Photo #19: Lid blank ready for Mounting
Photo # Face dressed and recessed

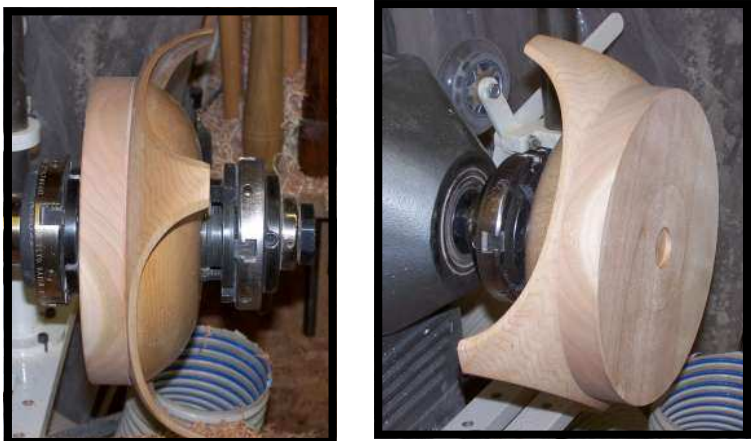
I reversed the lid blank on the lathe so I could remove some of the waste from the inside and cut a tenon to fit into the rabbet of the bowl. Fitting the tenon to the rabbet is pretty much the same process as fitting a lid to a turned box and is very much a trial and error process where you sneak up on a good fit.



Photo #21: Blank reversed

Photo #22: Rough hollowing done

I got lucky and managed to get a really good fit on the tenon/rabbet between the lid and the bowl, tight enough to support the bowl with the chuck attached. I want it tight at this point because I will be using the bowl itself as a friction drive while I turn the top surface of the lid.



Photo#23: A pretty good fit

Photo #24: Reversed once more

No, I am not quite crazy enough to rely on a friction fit on a 1/8" tenon to support a piece this size while turning it. :) I brought the tailstock up and used it to apply pressure to the lid to hold it in position while I turned the top surface. I wanted the top surface of the lid to be flush in the bowl rabbet and simply continue the curve of the legs. I also intend to glue a maple disk to the top of the lid and shape it into a handle for the lid, so I did not need to get too close to the tail centre while turning and sanding.



Photo #25: Tailstock support for lid



Photo #26: Lid turned and sanded

I will be taping the lid in place while I turn a flat in the centre for gluing on the maple disk, so I applied a coat of my beeswax/mineral oil to prevent a bunch of adhesive residue from sticking to the bare wood. Due to my absolutely phenomenal organizational skills I was unable to find even one of the half dozen or so rolls of masking tape that I am sure I have around here, so I used this black cloth tape which I normally use for repairing book bindings that have split. As it turned out that may have been a blessing in disguise.



Photo #27: Finish applied



Photo #28: Lid taped in place

I am afraid I neglected taking any pictures of a few steps here. With the lid taped in place I moved the tailstock back and turned a flat area in the centre of the lid. I then removed the piece, chuck and all, from the lathe. I returned to my other chuck with the #1 jaws and turned a disk of maple to use as a handle for the lid. I put the bowl back on to the lathe and glued the maple disk on to the centre of the lid. Once the glue had set up I started to turn a tenon on the handle disk to allow me to mount it to finish turning the underside of the lid.

At that point the tenon on the bottom of the bowl that was supporting the entire assembly broke and the bowl wound up on the floor. I can only guess as to the cause of the failure of the tenon. It may have had something to do with the number of times I had had the piece on and off the lathe, but the chuck remained in place the entire time and I don't remember bumping it or doing anything that might have weakened the tenon.

My best guess at this point is that since the board I cut the original blank from was stored in an unheated shed the failure may have been the results of a wood movement issues.

The bowl had remained mounted in the chuck right from the time I originally mounted it to hollow the inside. It had sat in my heated shop overnight while I was working on the lid blank, so it may have been trying to move and the chuck wouldn't let it, so it started to split.

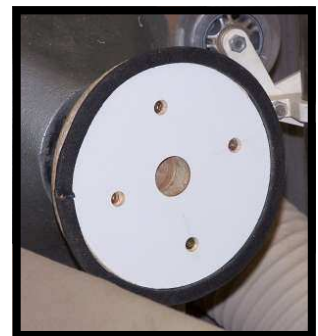
On the second day I was using tailstock support when I had it mounted for turning the lid, so the crack was not stressed. When I removed the tailstock support in order to flatten the area in the centre of the lid I was using very light shear scraping cuts which would not have stressed the tenon very much. When I started cutting the tenon on the handle disk I did not feel that I was cutting aggressively, but it was apparently enough stress to shear the tenon off the bowl bottom. If I had returned to using the tailstock support the tenon would very likely have stayed on.

However, sometimes miracles do happen. The bowl survived its trip to the floor entirely unscathed. I could not believe it when I picked it up and checked it over. I had had the tool rest oriented across the end of the piece so it (and ME!!!) was out of the line of fire when the tenon broke. The cutting resistance of the tool edge must have given the piece just enough "lift" that it cleared the lathe bed on its voyage. The cloth tape I was using to hold the lid in place may have provided more protection to the edges than masking tape would have. And the ankle deep layer of shavings on the floor that cushioned its landing may have had something to do with it, as well. :)

Whatever the causes and reasons, I was extremely grateful not to have to scrap the project. Instead all I had to do was to go to "Plan B" for turning a tenon on the end of the handle. I mounted my smaller vacuum chuck on the headstock to use as a friction drive and this time I brought up the tailstock both to support the lid and centre it, using the dimple that was still there from the forstner bit I had used to bore the mounting recess in the maple disk.



Photo #29: Tenon sheared off bowl bottom



So, with the drama hopefully over with, I continued by turning a tenon on the end of the handle. That allowed me to reverse the lid once again to finish turning the inside surface.



Photo #31: Tenon cut on handle Disk

Photo# 32 turning the inside of lid

I sanded and finished the inside of the lid and the turned it around again to finish turning the knob. I did the bulk of the shaping with the tailstock in place and then turned on the vacuum to allow finishing the middle of the handle.



Photo #33: Lid inside finished



Photo #34: Knob turned, lid complete

Now it was time to finish the bottom of the bowl. Since I had lost the tenon I had also lost the cantering dimple, so it was a little more time consuming to get it running true on the vacuum chuck. The design helped there because I could set the tool rest so it was almost touching the bottom of one of the feet and then rotate the lathe by hand to check the gap at the other three feet

It only took a couple of adjustments to get it running true. I switched over to a curved tool rest so I could get the tool rest close to the bowl bottom while maintaining a generous clearance against accidental contact with the bowl feet. When the tenon had sheared off it had torn some wood out below what I had intended to be the surface of the bowl bottom so I had to re-define the curve and blend it in from further up the bowl wall. Fortunately I had not tried to make the bowl walls too thin in the first place so I still had the material there to work with.



Photo #35: Bowl mounted on vacuum chuck



Photo #36: Repairing the damage

Once I had the bowl sanded I signed and dated it and applied the finish. I was especially pleased to get this one to completion. :)



Photo #37: Bottom sanded and finished

Photo #38: Completed project



If you made it this far, thanks for looking. :)