

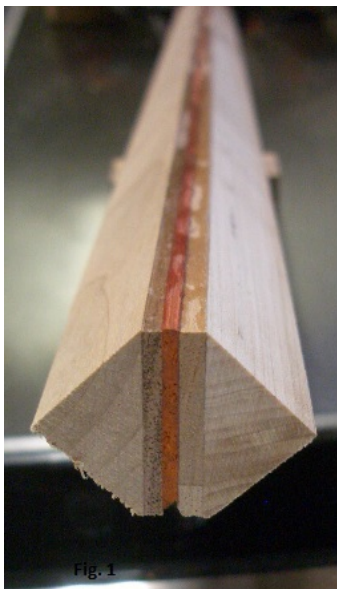
SPIN TOPS

AN EXPERIMENT

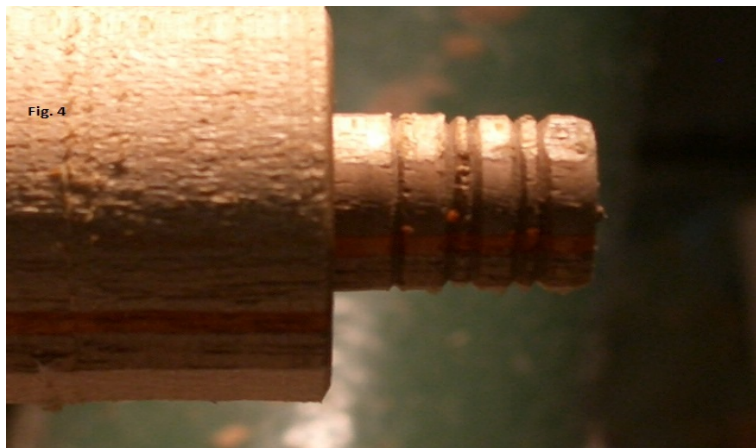
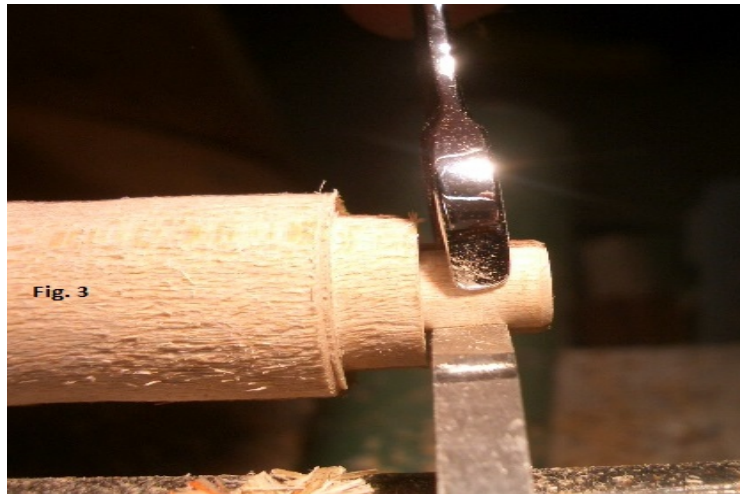
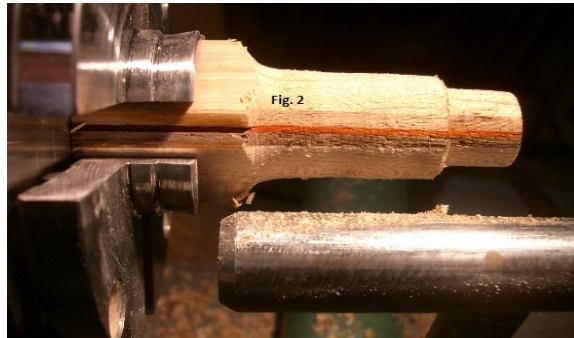
In the years I have been turning I have never tried to make a spinning top. I don't know why I didn't but the Summer Turning Challenge gave me an excuse to try.

So, not really knowing much about tops, the question that pops to mind is “How must the weight be distributed to get a top that spins for an acceptable time without falling over?” This experiment is an attempt to answer that question.

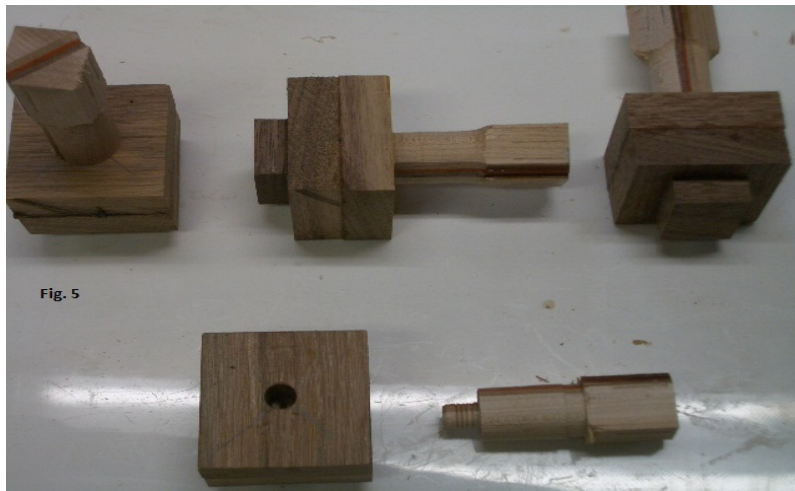
Firstly, I went to my scrap bin to get some wood to work with. Tops do not require a lot of wood so this approach seemed rational (read that to mean 'cheap'). I laminated some strips of padauk, walnut and maple to make handles (Fig. 1) and then some walnut pieces to make the lower bodies with the most mass.



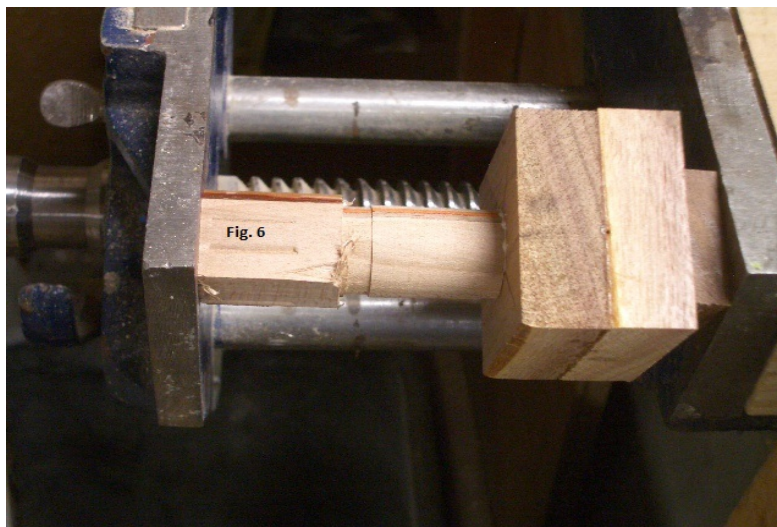
After the glue was dry I cut the handle material into four pieces, one for each planned top. I installed my chuck with spigot jaws on the lathe and mounted each handle piece to turn a tenon on one end (Fig. 2). I then turned the tenon to 1/4 inch using an open ended wrench for sizing (Fig. 3). Lastly, I cut some grooves in the tenon and left the tenon fairly rough to increase glue holding power (Fig. 4).



With the handles ready I drilled 1/4 inch holes in the walnut blanks to receive them. Depth was just deeper than the length of the handle tenons to avoid hydraulic pressure from the compressed glue. Figure 5 shows the pieces with and without the handles friction fit into the 'bottoms' (no glue yet) as a test.



Glue was applied to the tenons, the handles pressed into the bottoms and each placed in a vise for drying (Fig. 6).



After this it was just a case of mounting each glue-up back onto a Steb centre mounted into the chuck and bringing up tailstock support for the turning process (Fig. 7). Sanding through to 400 grit was conducted and four coats of Mylands high friction polish was applied with enough pressure and heat to cure each layer.



The top was cut free at the handle end with a skew and the handle mounted into the chuck's spigot jaws (Steb centre removed). See Fig. 8. To minimize damage the handle was wrapped with painters' tape before pressure from the jaws was applied. To ensure the whole top was concentric the lathe was turned on and if the point on the bottom showed any wobble the top was repositioned until all wobble was removed.



Note (in Fig. 8) that the waste on the bottom's end has been cut away leaving a flat spot the had to be addressed.



This was done with a sharp skew followed by sanding (Fig. 9 below). Application of finish was done as before. The small cut-off point on the top of each handle was sanded and finished free hand out of the chuck.

These were the steps for manufacturing each top. As each top was completed I tested for 'spinability'. Based on the spin test I cut a different profile trying to get a longer spin time. The profile shown above in Fig. 7 was a total failure. It wouldn't spin at all and fell over almost immediately.



Profile changes (Fig. 10) brought the centre of gravity lower into the bottom but the handle still had too much mass as proven by my tests...it spun for a second or two before toppling over. Testing so far

showed that I had to get more mass out of the handle and concentrate it lower into the bottom.



Further changes (Fig. 11) had the centre of gravity even lower and the handle thinned out more. This top, when spun correctly, gave a good 15-20 seconds or so of spin before falling over. So I decided to take the test another step forward and further reduce the handle in diameter, make the top of the bottom (I know that sounds strange) flatter and the bottom's lower profile shorter thus bringing the centre of gravity even lower. The results in Fig. 12 shows that plans and execution do not always coincide.



I cut too close to the hole for the handle tenon and the parts separated. Oh well...at least now I know how to approach the design of tops should I want to get into making more of them.

So in conclusion, below is a photo of all three completed tops. From left to right they are rated as Dud, Blah and Acceptable.



Fig. 13

Gary Landry
August 2020