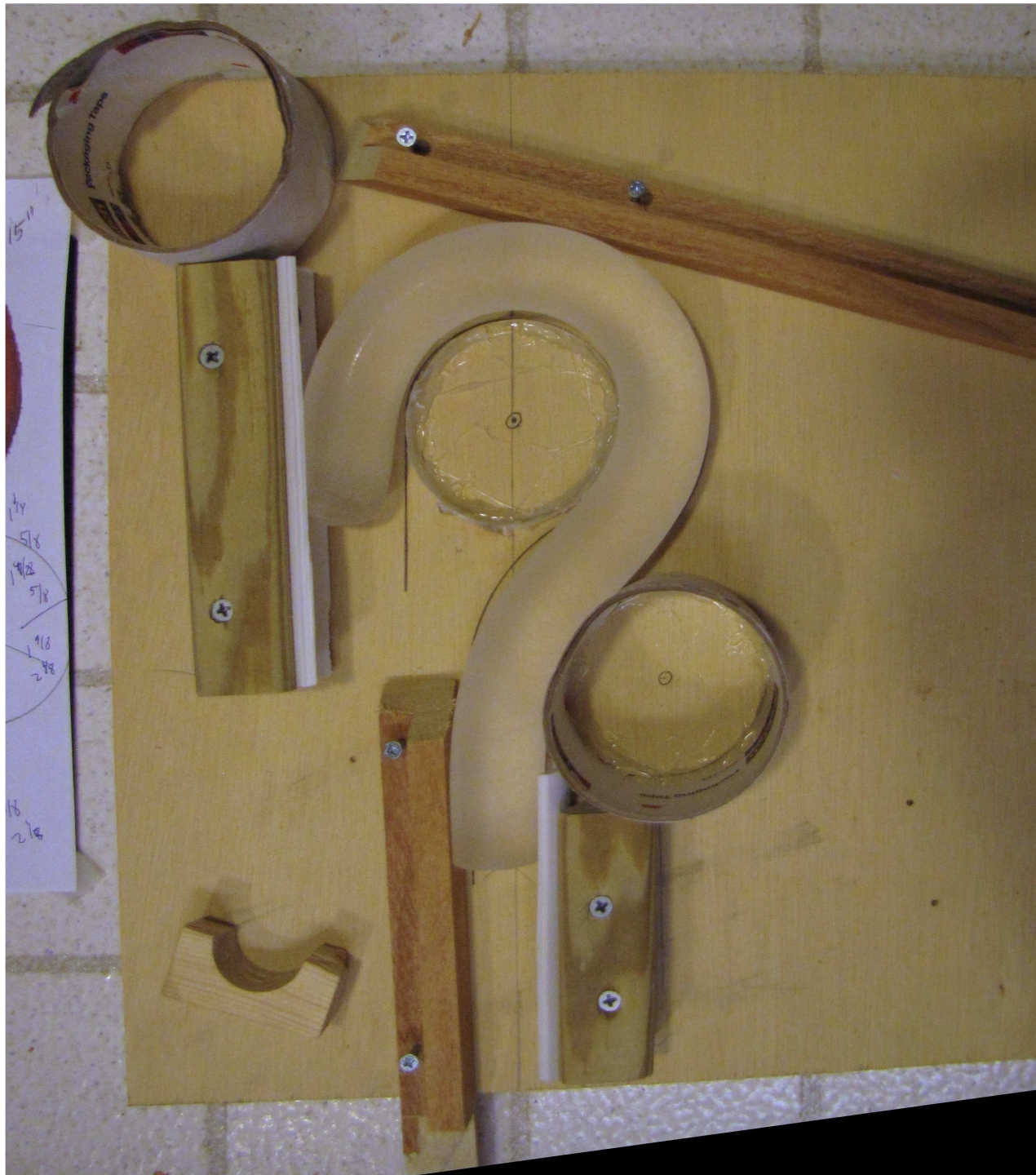


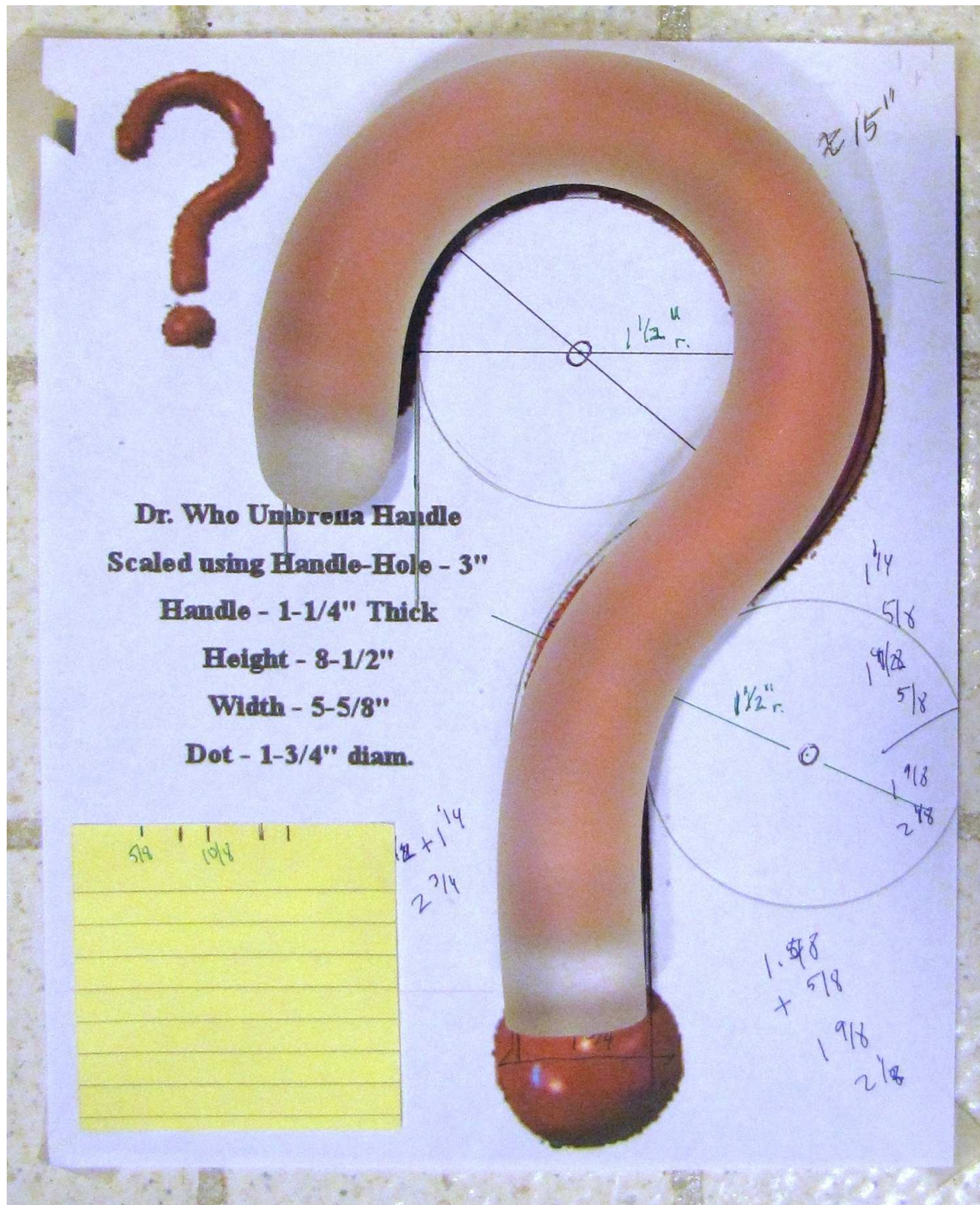
Doctor Who #7's Umbrella part 1

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Well, it was a first attempt. It turned out lopsided; the main curve was skewed to the right. One of the cores couldn't stand the pressure and deformed. And broke loose!

The rod also started pushing in strange directions. I hurriedly added the brownish wood blocks as the rod started to cool to keep things aligned.



Both ends of the ? are too long, but the biggest issue is that the ? is way out of alignment with the diagram.

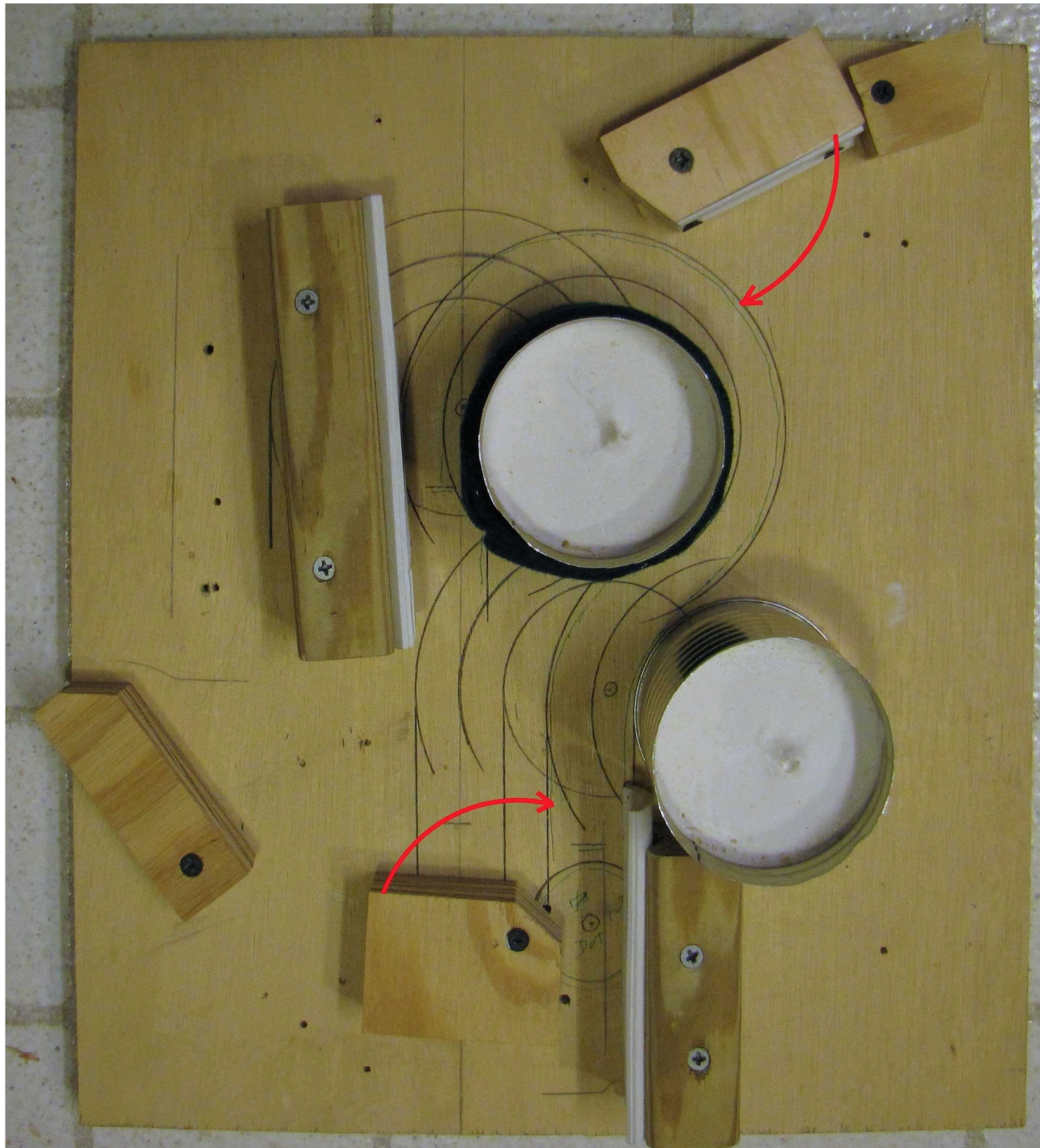
My errors:

- The stops need to be TIGHT against the rod. Mine were too loose.
- The tape cores for the center of the curves were not strong enough; they didn't remain circular
- The rod is springy! As it was cooling I hurriedly screwed down some additional stops at the top of the ? curve, and to hold the tail of the ? in place without my fingers. I needed more stops!

The good news:

- I only had 1 flat spot, where the curve from the main loop reversed direction towards the tail.
- No bubbles

Well, as they say, if at first you don't succeed...



Doctor Who Question Mark Jig
Version 2 has several changes from
Version 1:

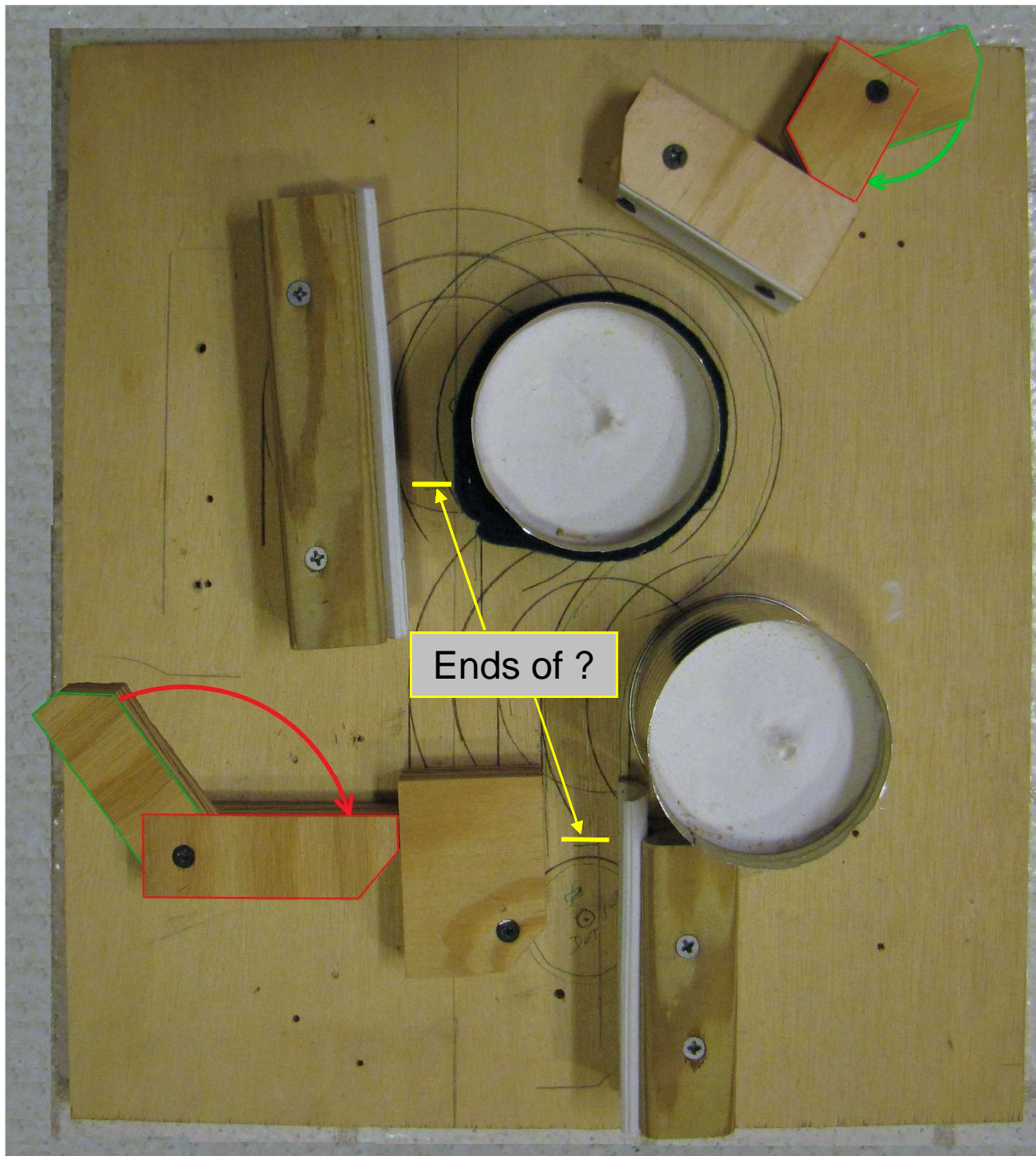
-In the USA, Campbell's Chunky Soup cans are 3" in diameter (except for the rim). Because the cross-section of the rod is a circle, it won't touch the can anywhere near the rim. I cut the cans off about 1-1/2" tall, screwed them down on the base, and filled them with plaster of Paris. They did not move!

-Someone mentioned using felt to pad the form. I wrapped the central can, but forgot to wrap the can where the loop reverses direction into the tail. Next time!

-The fixed stops were aligned a bit tighter. I held the deformed ? and eyeballed the center line of the rod and anchored the stops accordingly.

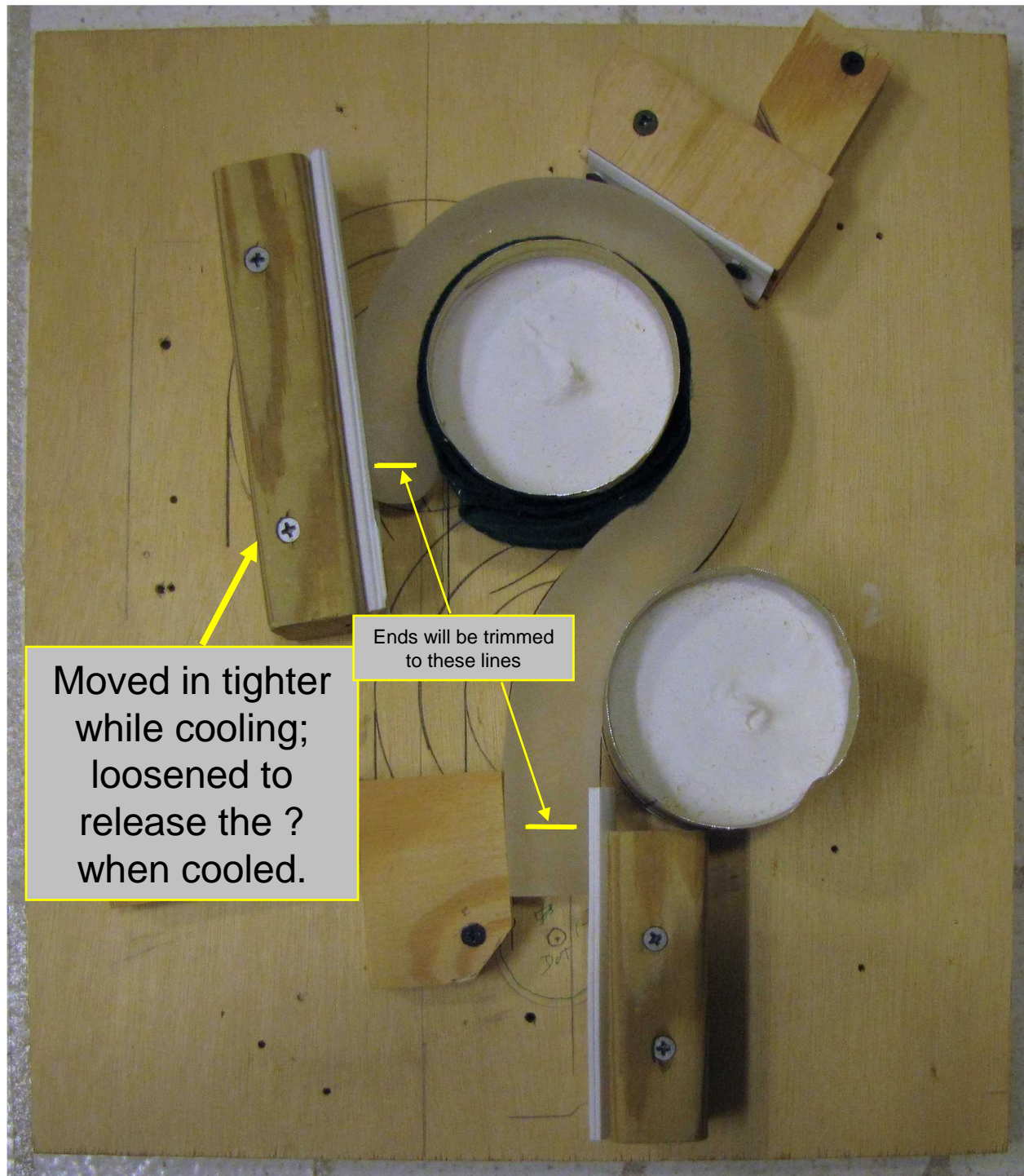
-I added some double-stops: These are intended to swing into position once the rod is lined up on the two fixed stops. Each double-stop is made from 2 blocks:

-Each block is anchored with a screw at one end. The first block swings next to and holds the rod in alignment.



The second block swings in and holds the first block in position. The two blocks form a right angle when locked in position.

The double-stops allow the acrylic to be bent into shape on the fixed stops, then the double-stops swing into position to hold the alignment. One is positioned on the outside of the main loop of the ? and holds it snug around the center can, the second holds the tail of the ? in position straight down. The combination of the stops means I can put the rod in the jig, lock the stops, then step back and watch it cool!

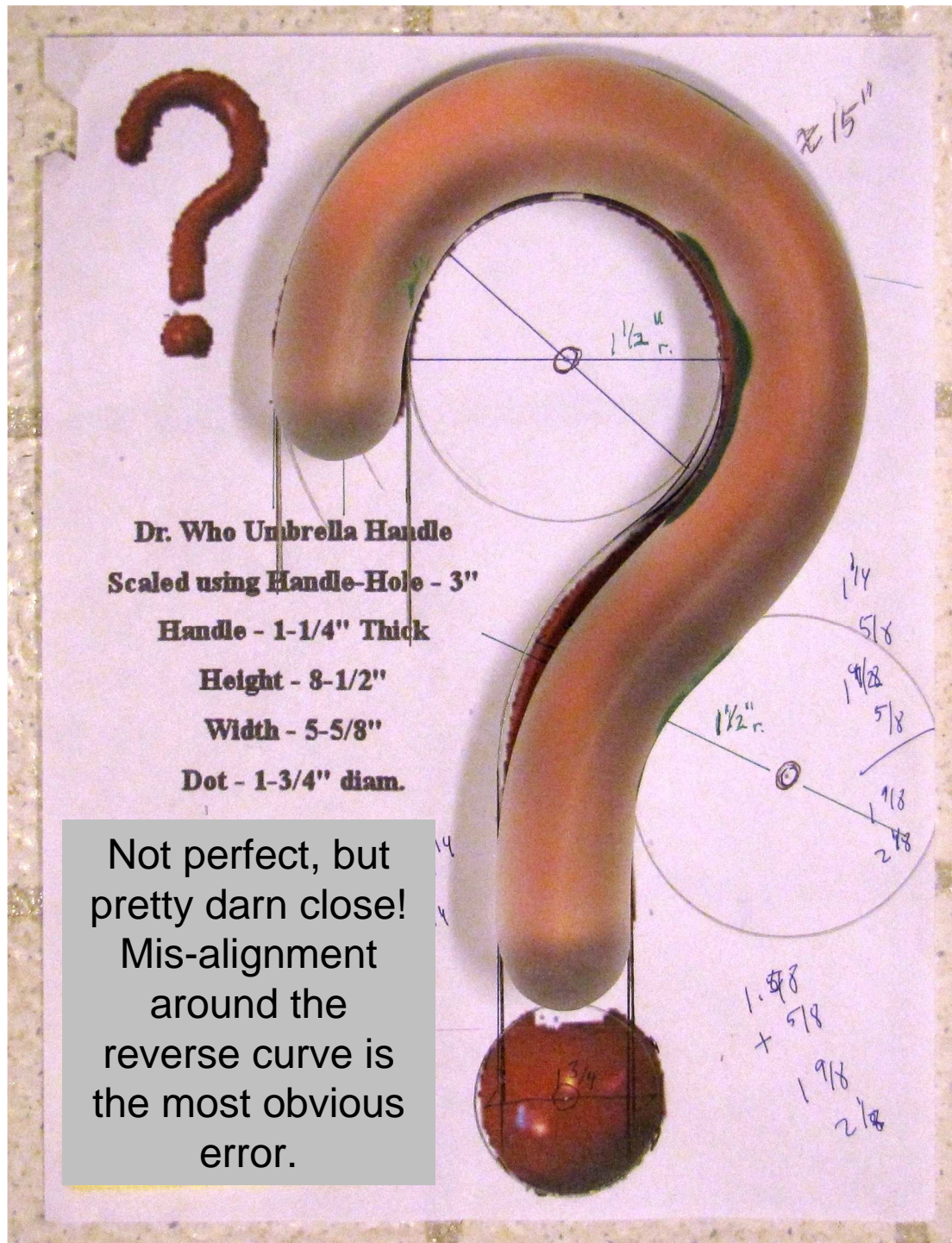


One curiosity... For my 2nd attempt I re-heated the handle from the first attempt. As the rod heated, it straightened back out! All the way! As if it had never been bent!

The second attempt is a success! Both ends of the ? are too long and will need to be trimmed.

My errors the 2nd time:

- I didn't wrap both cans in felt; the inside of the 2nd curve (where the ? straightens out) had a double-ripple. This may have been an imprint from the side of the can!
- The stop at the start of the main loop was a bit too loose; I did some quick re-aligning while it was still hot.

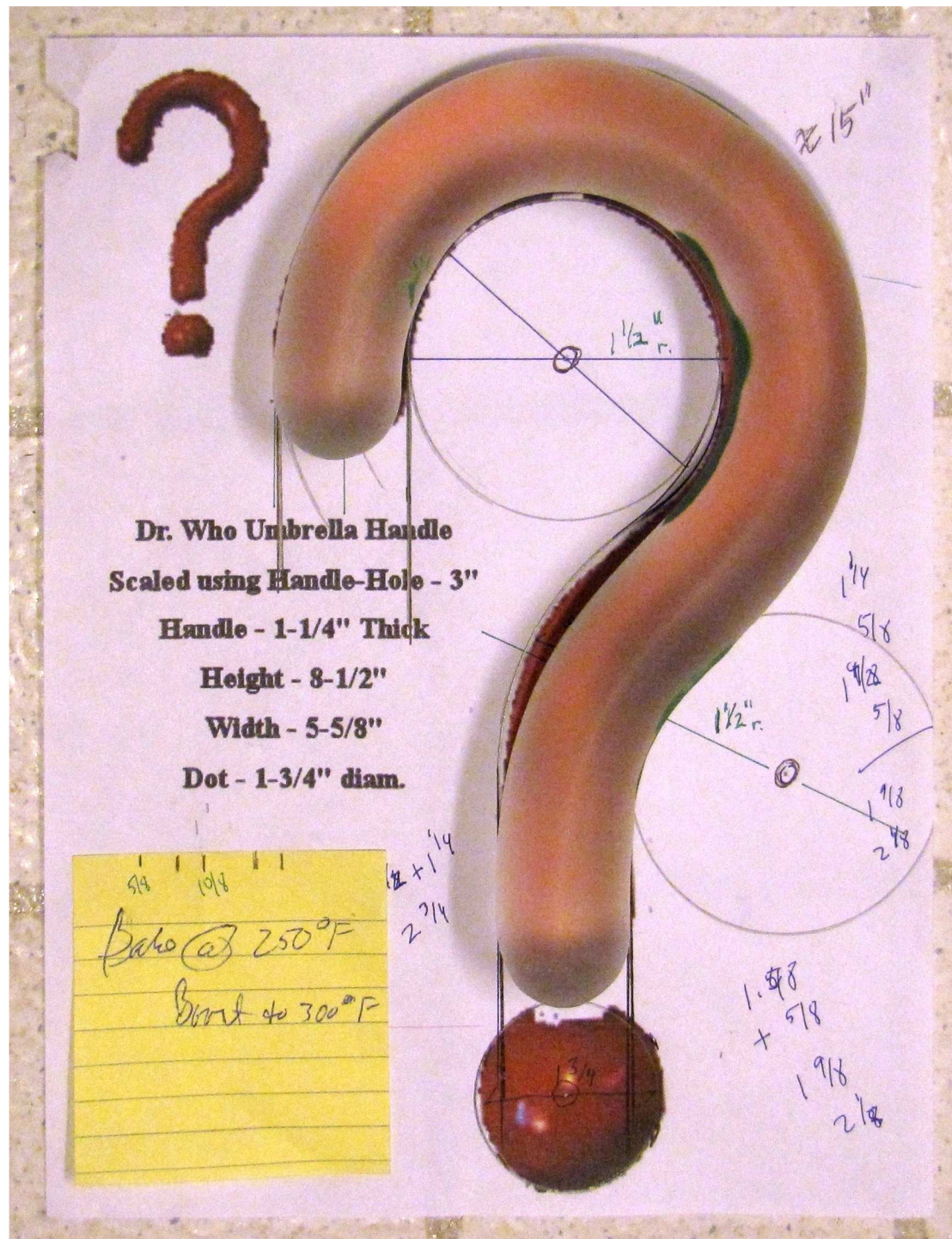


Next time (if there is one):

- make the fixed stop at the start of the main curve a double-stop. I had to move the stop in a bit closer once the hot rod was in place. Maybe use an off-center circle as the 2nd stop-- able to increase the pressure over a wide range.

Places to patch:

- Both the start and tail of the ? are too long. Amputation shortened them to the correct length. It's a pain to try and use a sander on the start of the ? now that it's all curved! Both ends need to be sanded. My rough sanding left a flat spot at the tip of the ? at the start of the main loop. I'm building that up.
- Inside of the main loop had a flat spot just before the S curve; the inside of the 2nd curve had the double-ripple. Probably a limper piece of acrylic would make the double-curve without as much stress.
- Outside top of the main loop. I may have nicked it with a screw head on the upper double-stop. I remove the screw partway through the cooling process to prevent any other boo-boos!



- I'm using Green Putty to patch the dings. Outside! Smells a bit like Plastic Wood, but stronger!
- It's putty/sand/putty/sand/putty/sand so far. It's easy to tell where you need another dab of putty-- when you sand, the low spots don't get sanded, and remain a brighter green than where you've sanded. You can feel the rough spots when you pause in your sanding. I have to fight the urge to say "good enough," but it's only another couple hours for the putty to dry.



Dr. Who Umbrella Handle
Scaled using Handle-Hole - 3"

Handle - 1-1/4" Thick

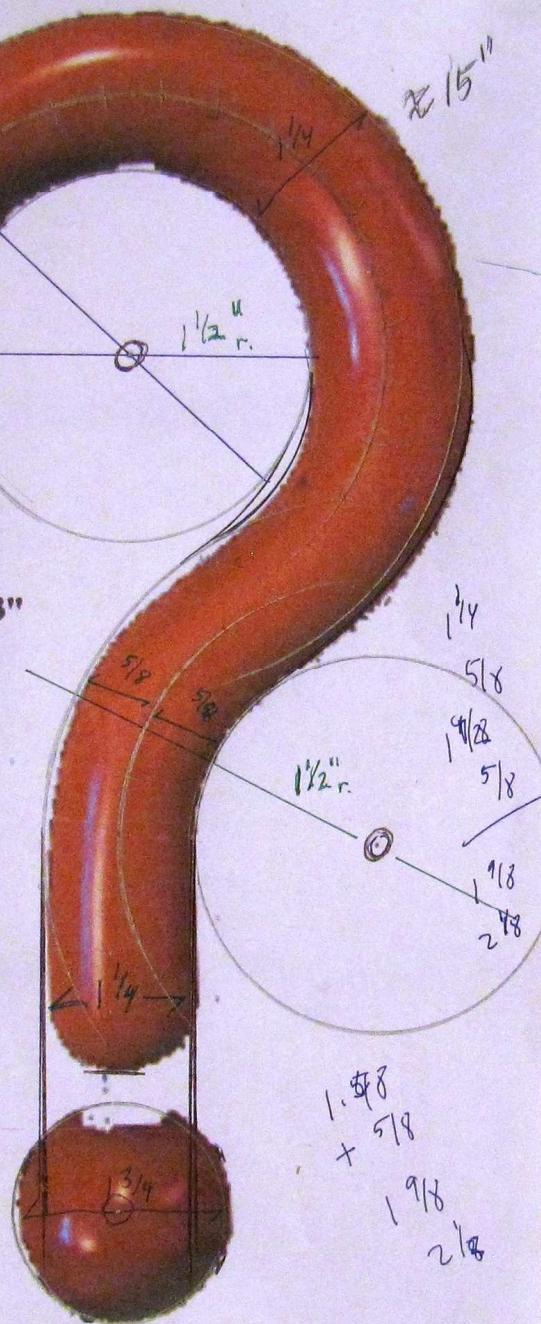
Height - 8-1/2"

Width - 5-5/8"

Dot - 1-3/4" diam.

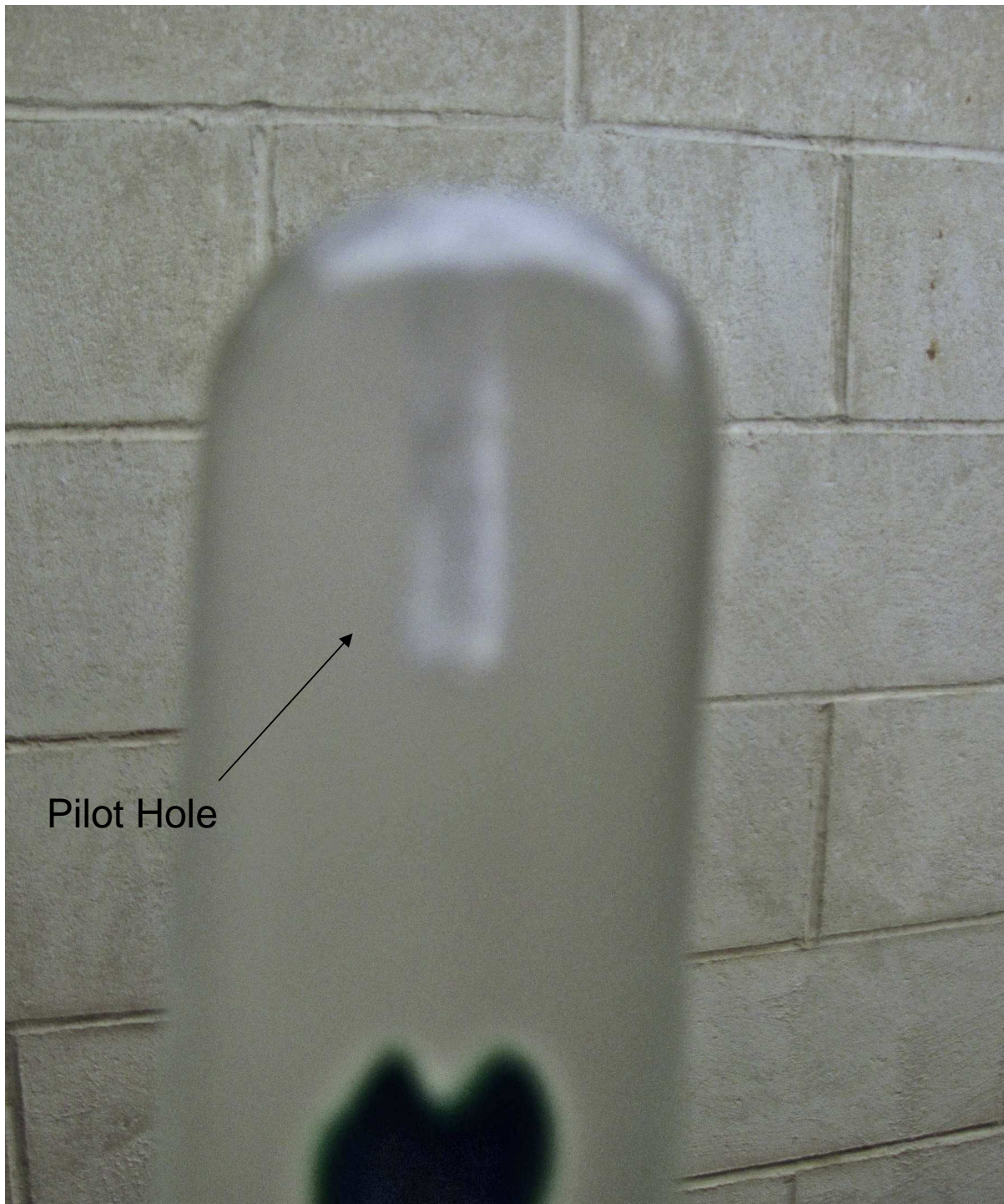
5/8 10/8
Bake @ 250°F
Bake to 300°F

1/2 + 1/4
2 7/4



1 5/8
+ 5/8
1 9/8
2 1/8



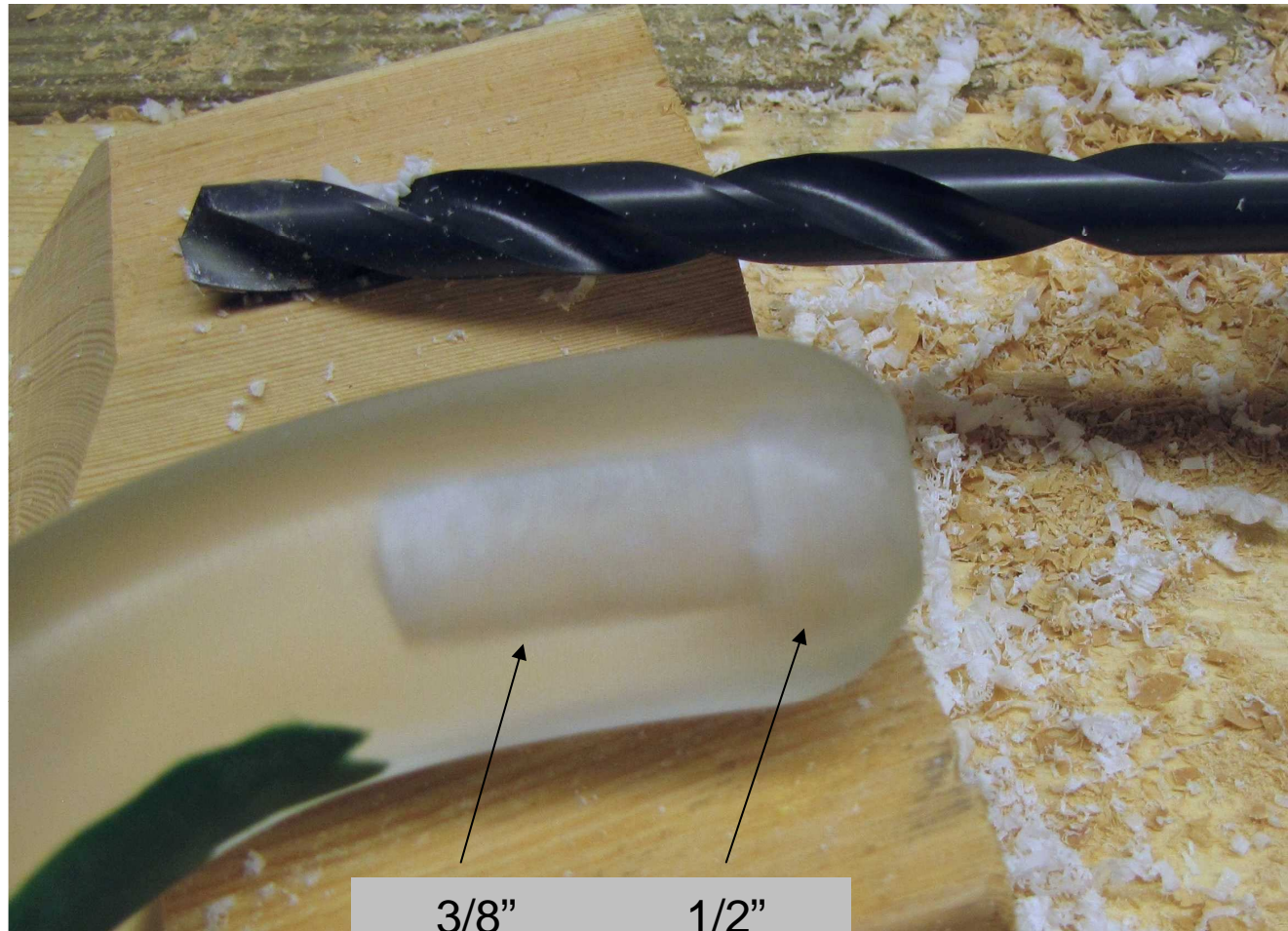


Pilot Hole

I sanded a flat spot on the bottom tip of the ?, just where the shaft of the umbrella will be inserted. It's easier to drill on a flat spot, rather than the nicely-rounded end of the handle! I drilled a pilot hole, about 1/8" in diameter or so (it's not a critical dimension). I'm adventurous, and don't have a drill press or alignment jig, so I eyeballed it. I took my time, and paused several times to look at the deepening hole from all sides. Fortunately, my eyeballs are still OK, and I only had to make minor corrections as I drilled the recommended 1-3/4" deep. While I drilled, the ? was lying down on a block of wood, and my drill attacked horizontally, my hand holding it in position. Once the hole is started, the main thing is to keep the drill parallel to the *desired* path of the hole. Frequent checks on the direction are a must!

Next, I enlarged the hole to 3/8". The drilling to enlarge the hole followed the path of the pilot hole without a lot of fuss. Due to requirements of the umbrella shaft, I needed a 1/2" hole in the handle (more later).

Enlarging to 1/2" required a trip to Homes R Us for a 1/2" twist bit (with a conical point), then back to drilling. Once again the large bit followed the hole fairly well. But when the drilling resulted in a snapping sound from the plastic when the bit got caught, I was glad my drill has an adjustable torque clutch. I was able to dial down the torque, so when the bit got stuck in the plastic, the clutch slipped, stopping any motion of the drill bit, and any potential damage to the ?!



3/8" 1/2"
Final drilling in
progress...

