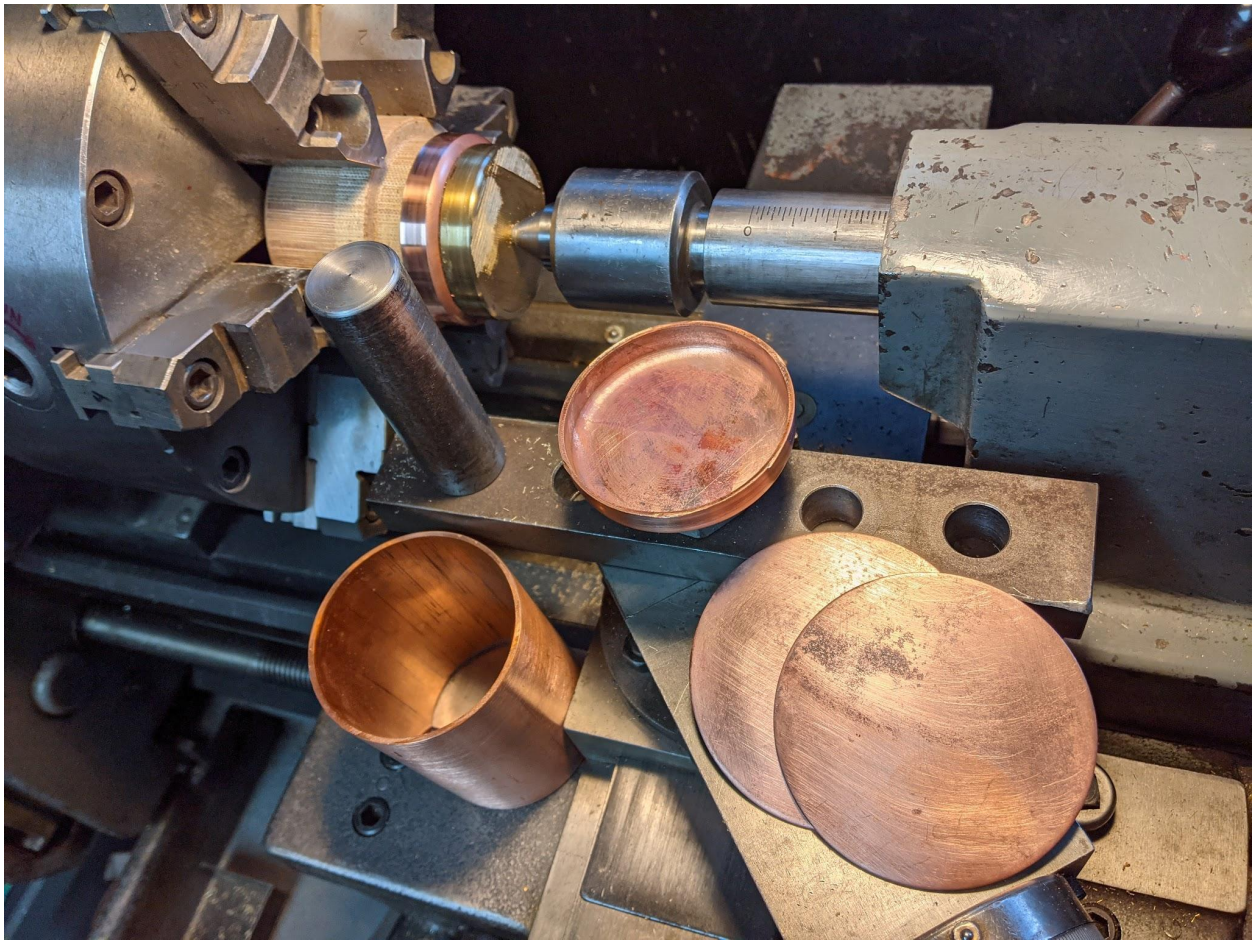
Shop Practice 1
Metal Spinning

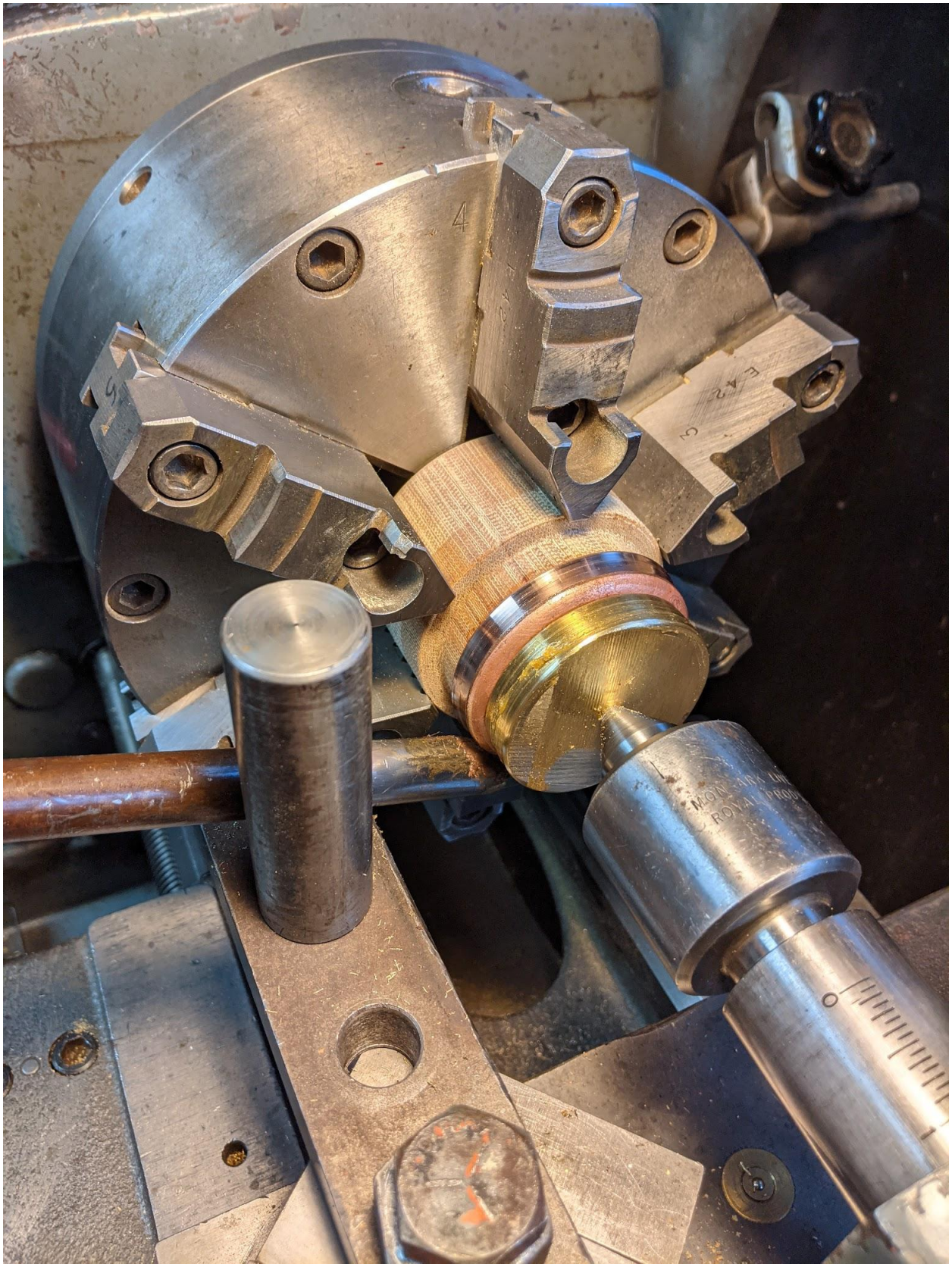
With this I hope to present some short columns that cover a little piece of the knowledge that is critical to the effective use of tools and processes in the fabrication shop. Much will be familiar and not very useful to the widely experienced. Kinda like watching Youtube only without video.
So some will say “I didn’t know that”, others will just yawn. So when something pops up in the shop I think might interest the few, I will write it down.

So metal spinning. It’s a great technique for making “roundy things”, like tank ends and dome covers. My example is making ends for two small boilers in copper. Any metal that is malleable is a candidate for spinning but copper and soft aluminum are the two most likely choices. Brass is often used and “cartridge brass” (a more malleable alloy) is most often used. But never fear, most “found in the alleyway dumpster” brass can be worked in stages.
All material needs to be annealed unless a dead soft condition is already known. Be aware if it’s soft but then sheared, it now has a harder edge. Annealing is by the usual process of heating until a dull red and then allowing it to cool. As the material is worked it will “work harden” and something that was moving very easily will become extremely resistant to being pushed into a new position. Then you just have to anneal it again. When annealing, oxidises will be formed and if you want a shiny part, they must be removed before getting embedded.
Once you have decided on material and design, a mandrel or former that the part is to be worked over must be created. In my example I used a piece of panellite phenolic sheet that was a drop from another job. Hard wood works well and of course if you have a piece of metal close to size you can certainly use that. Softer plastics do not work as spinning can create a lot of heat and plastics, go plastic. I tried Delrine once to no success.
The material blank to be worked should be close to circular so that the metal flows easily and does not present a hazard. The blank is centered

upon the mandrel and then clamped against it with a piece of padding material by pressure from the tailstock. Carefully start it rotating and check for centering. You can center it by loosening some of the tension of the tailstock and very softly bringing your tool up against the edge to ‘bump it ‘ to center.
An alternative when the finished part is going to have a center feature is to add a centering hole and a location pin.
Once the blank is rotating, clamped tightly between the mandrel and tail stock puck, it should be greased to allow slippage of the tool bearing against it. You then simply use a bar with a rounded end to force the metal against the mandrel shape. My example is a simple corner bend and the bend was accomplished with one annealing. I probably used about 4 repositionings of the tool to achieve the best leverage position. It takes a lot of force and the fence I use to work against is pretty robust. The tool is about 30 inches long so it generates a lot of leverage. The vertical bar in the picture is movable into various holes along the fence and the cross slide of the lathe is locked in place. I have used a piece of bar in a tool holder for very light work but it is not very satisfactory and it's worth it to change over the tool post.
Since I make very simple parts in my spinning work, I only have a need for a simple tool. True metal spinners use many different tools and make exotic shapes with interlocking parts and multipart mandrels that can be disassembled to be removed after being captured in the part.
An experienced metal spinner is both a craftsman and artist and some of their efforts can be watched on the internet.
I have found this method of making parts enjoyable and it gives an air of professionalism to the finished project.



The brass piece is the pressure plate. New blanks and a finished part are shown.



Here the tool has just forced the flat blank over the edge of the mandrel.