

Basic Lathe Tasks

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Objectives

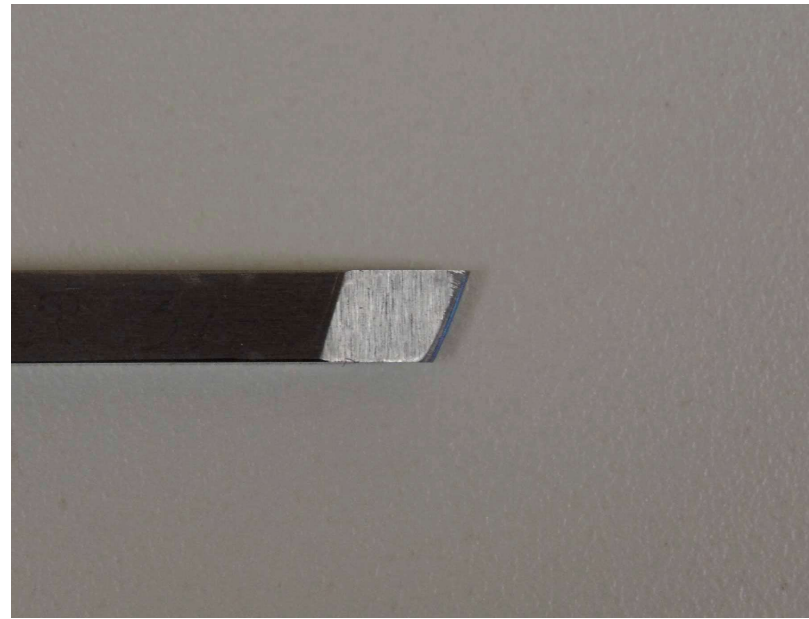
- Types of metals
- Cutting tool
- Lathe cuts
- Drilling
- Taps and dies
- Boiler bushings, axle bearings
- Wheels turning
- Safety valve

Types of metals

- “Free machining”, addition of lead, sulfur or phosphorus.
- Steel - 12L14
- Brass - 360
- Stainless - 303 or 416
- Aluminum - 2011
- Bronze - 932
- “Mystery metal”

Basic Cutting Tools

- Round nose tool -- radius of tip 0.020"



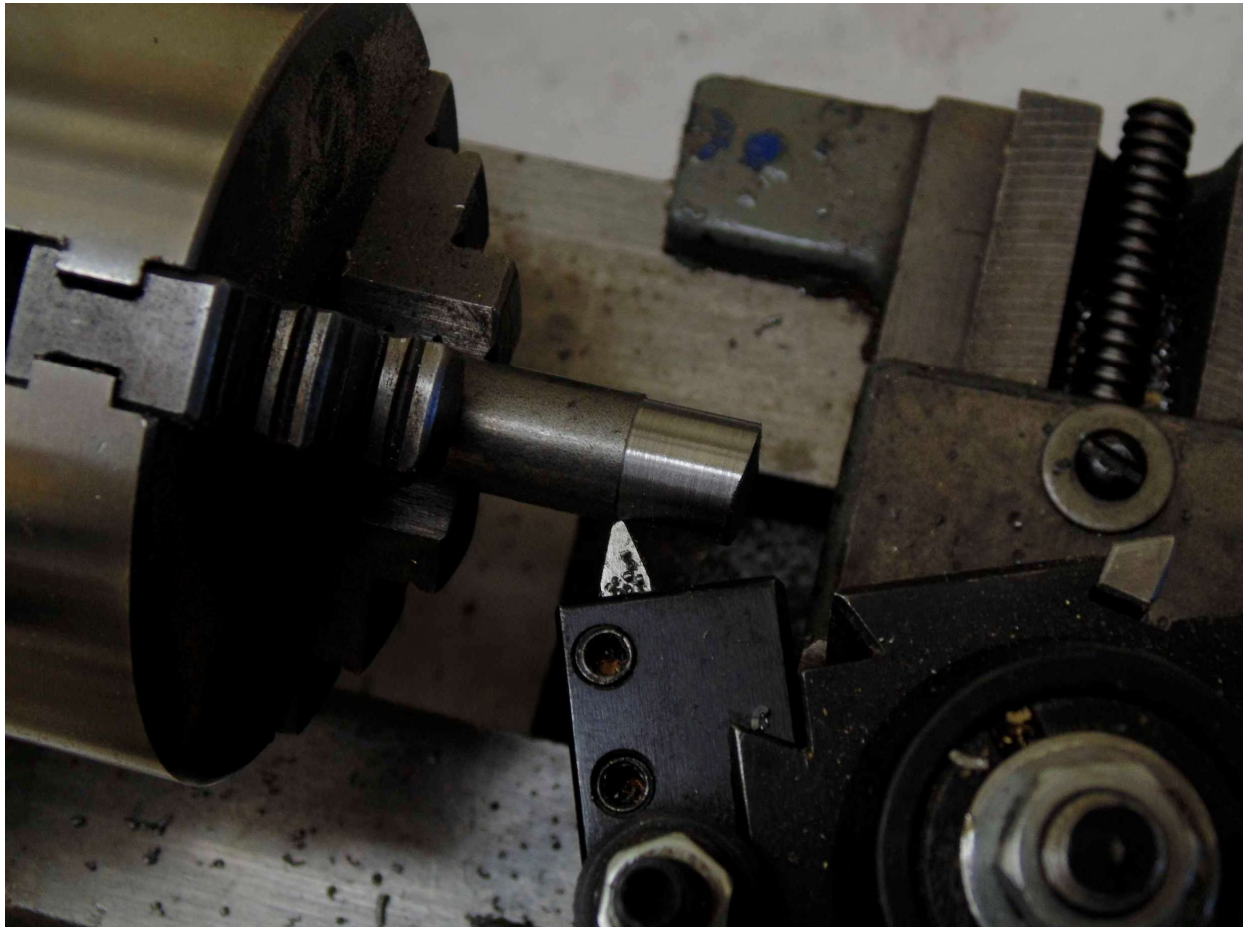
Basic Cutting Tools

- Square nose tool -- .062" thickness



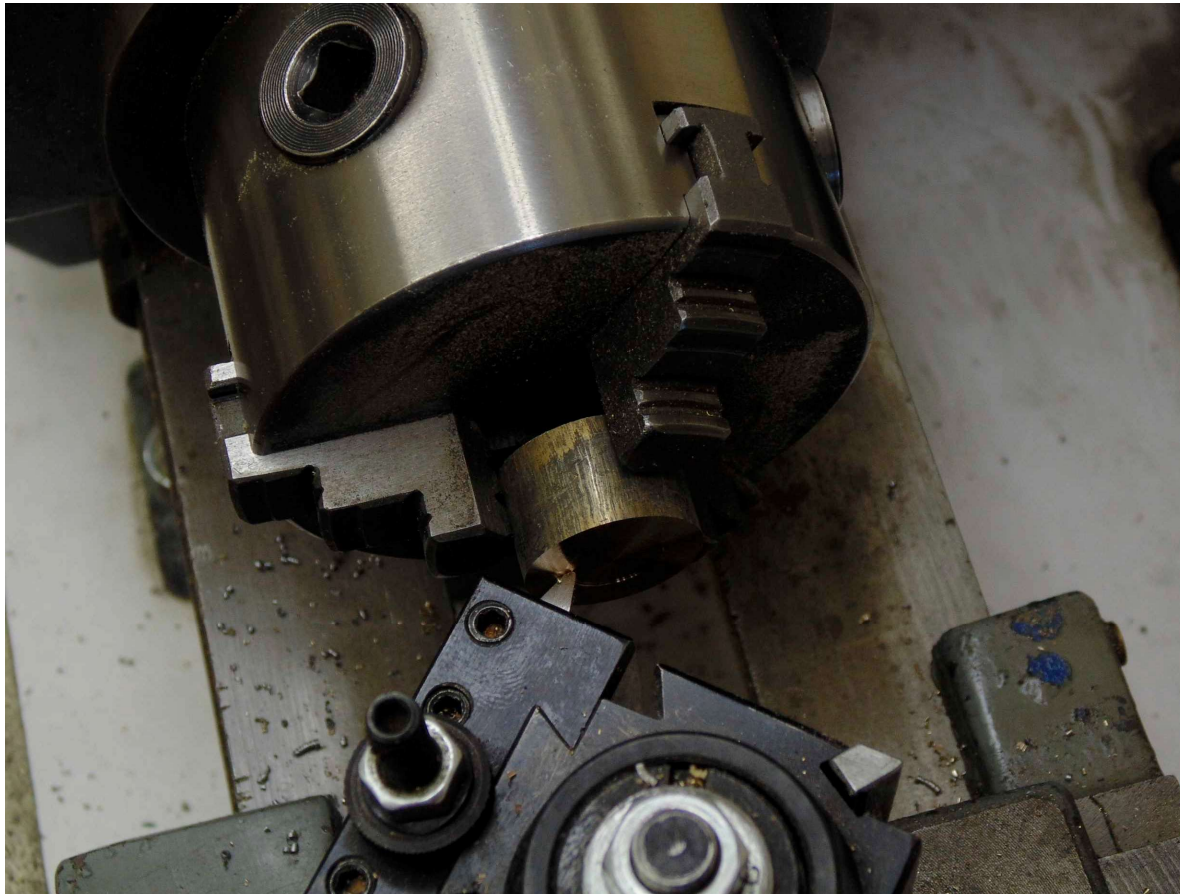
Longitudinal Cuts

- Depth of cut -- 0.010" to 0.015"



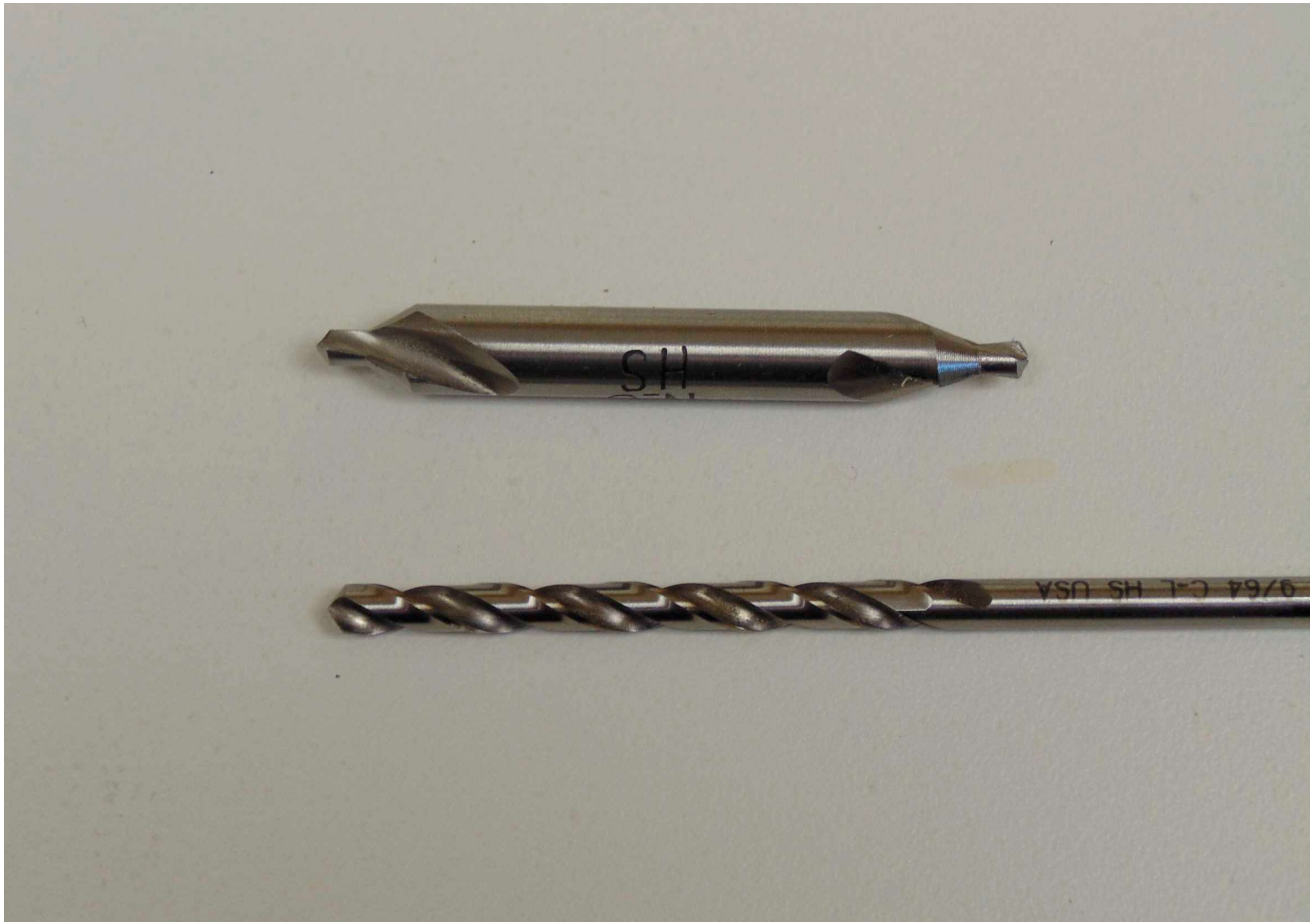
Facing Cuts

- Depth of cut -- 0.010" to 0.015"



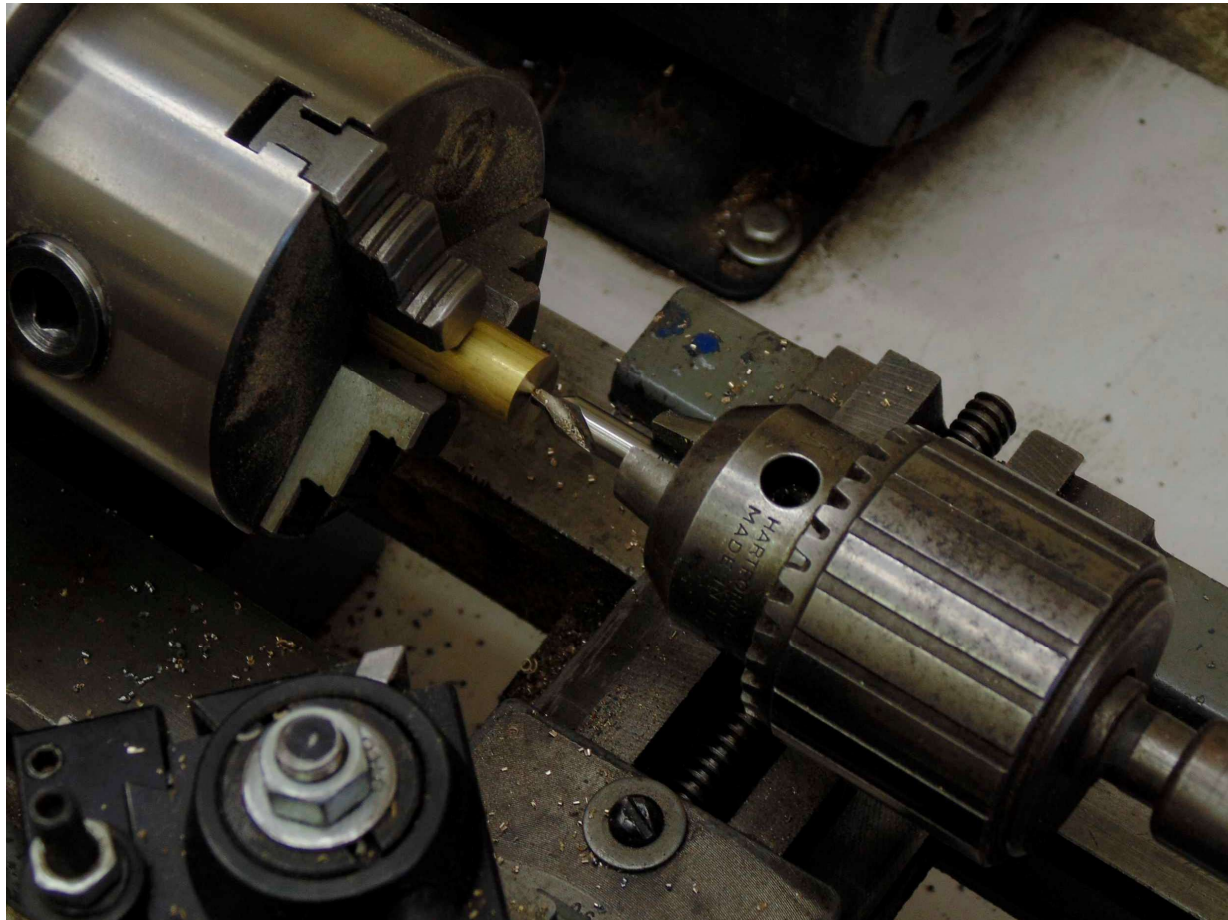
Drilling

- Center drill or hole starting bit



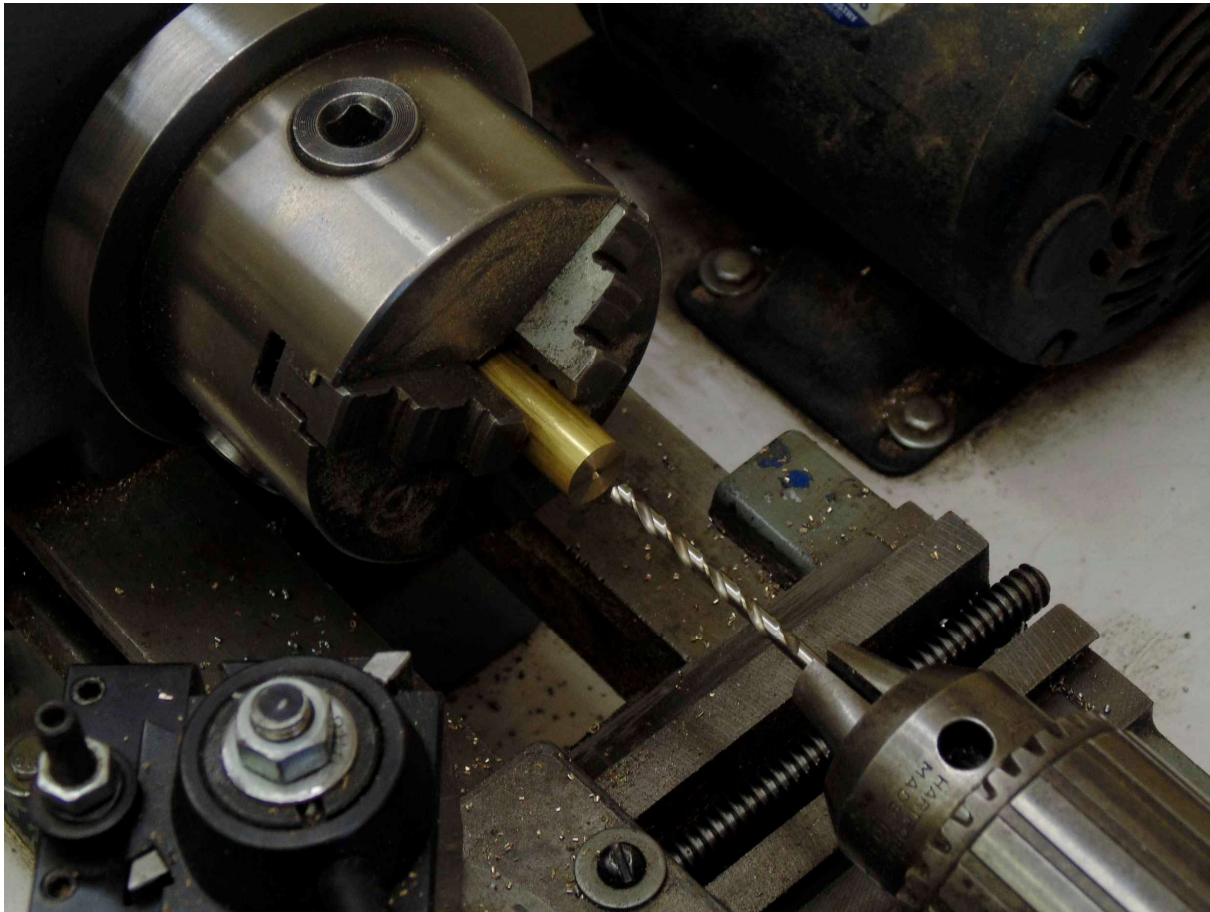
Drilling

- Always use center drill bit first



Drilling

- Clear chips frequently. Use cutting oil.



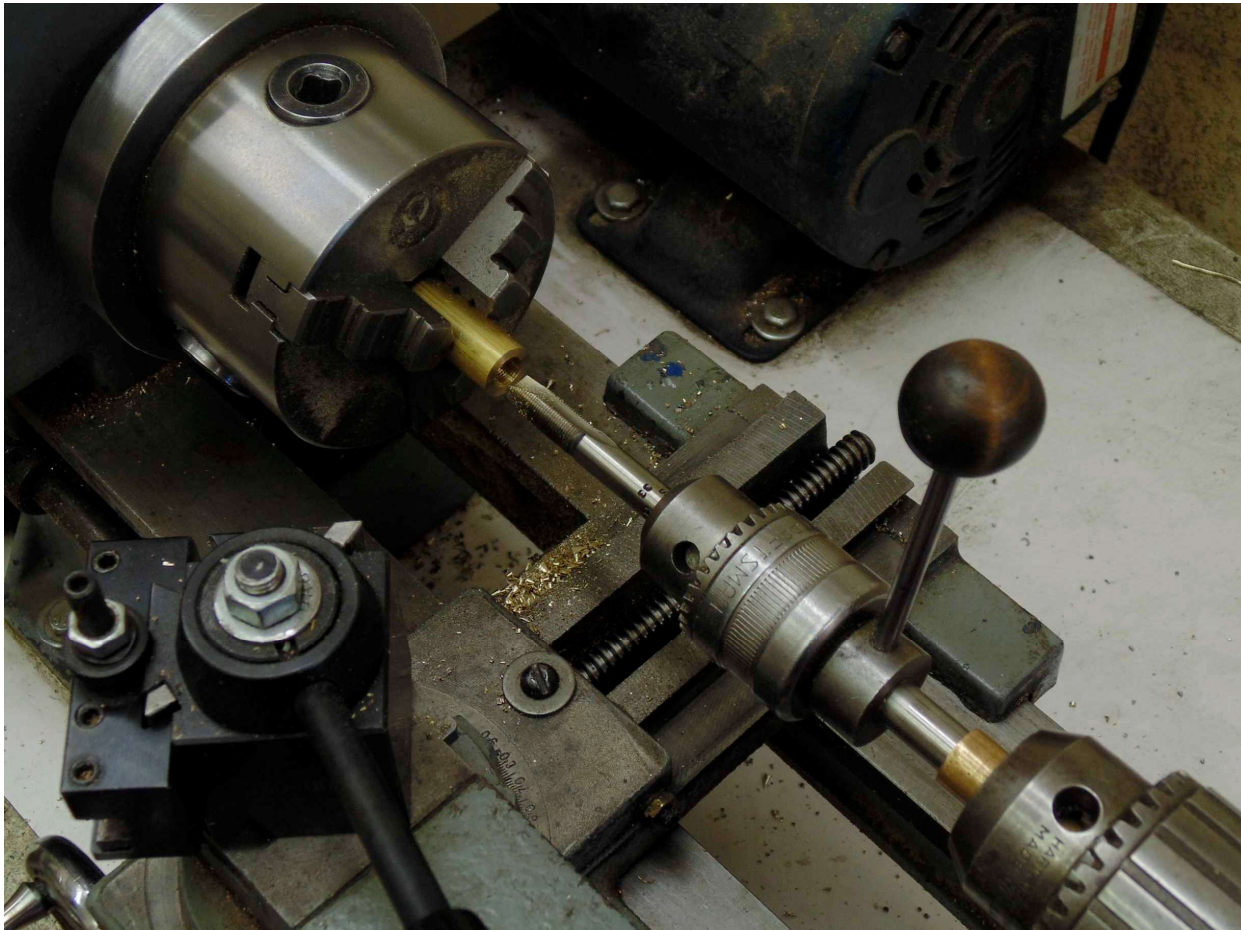
Cutting Threads with a Tap

- Always use a sliding tap handle



Cutting Threads with a Tap

- Turn lathe chuck by hand. Use cutting oil.



Cutting Threads with a Tap

- 0 x 80 (0.060" dia) tap into steel.

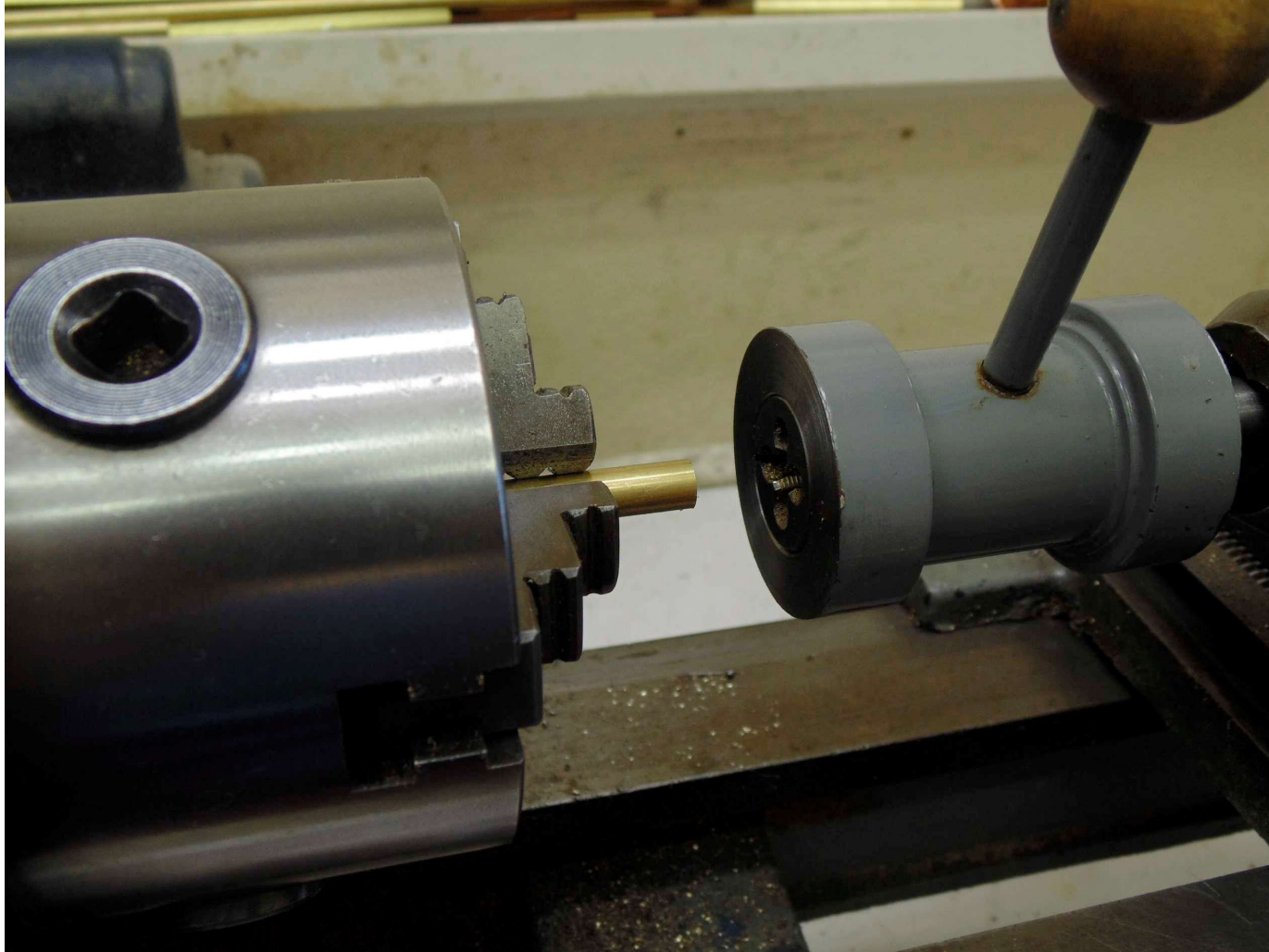


Cutting Threads with a Die

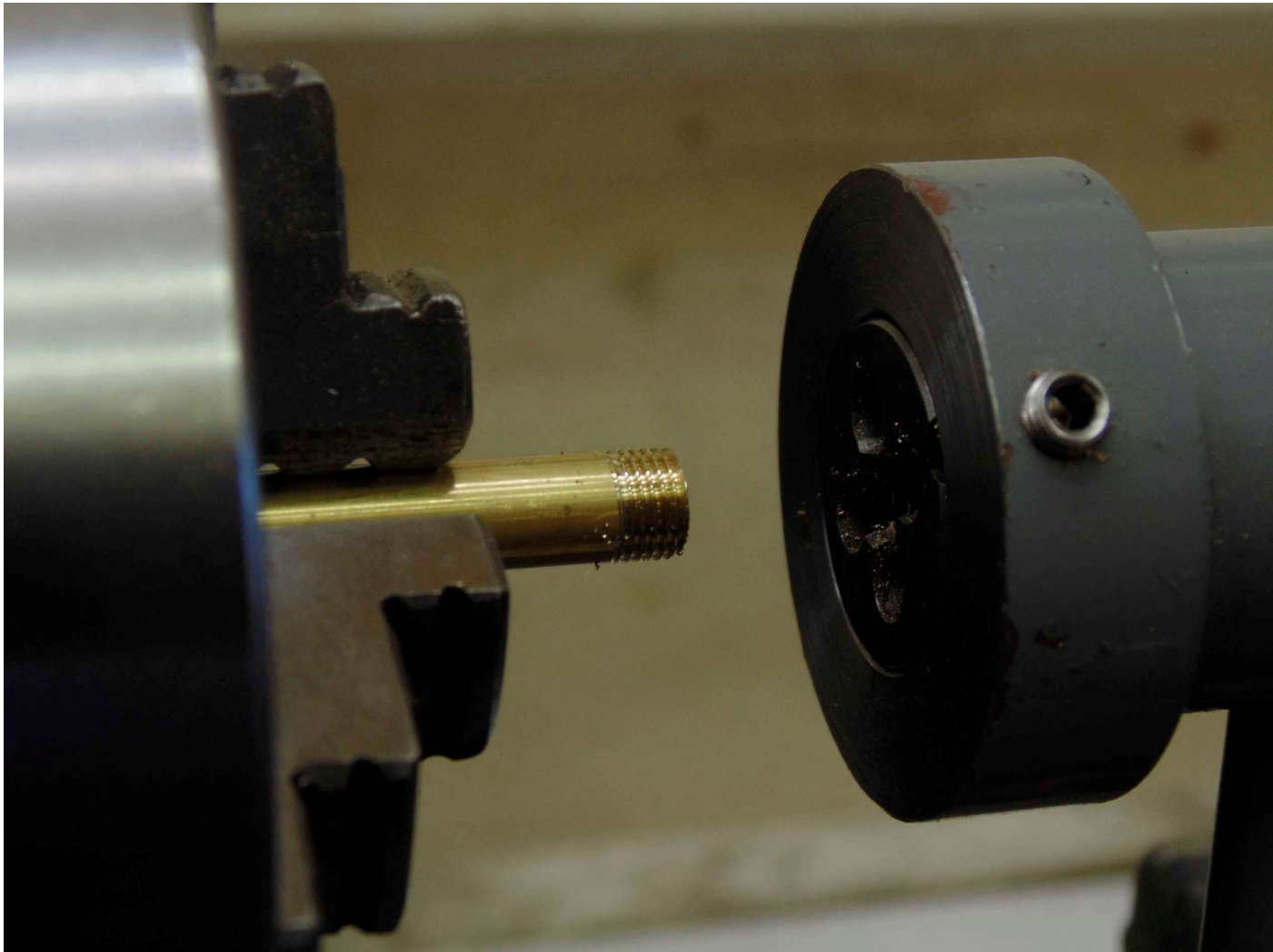
- Use a sliding die holder



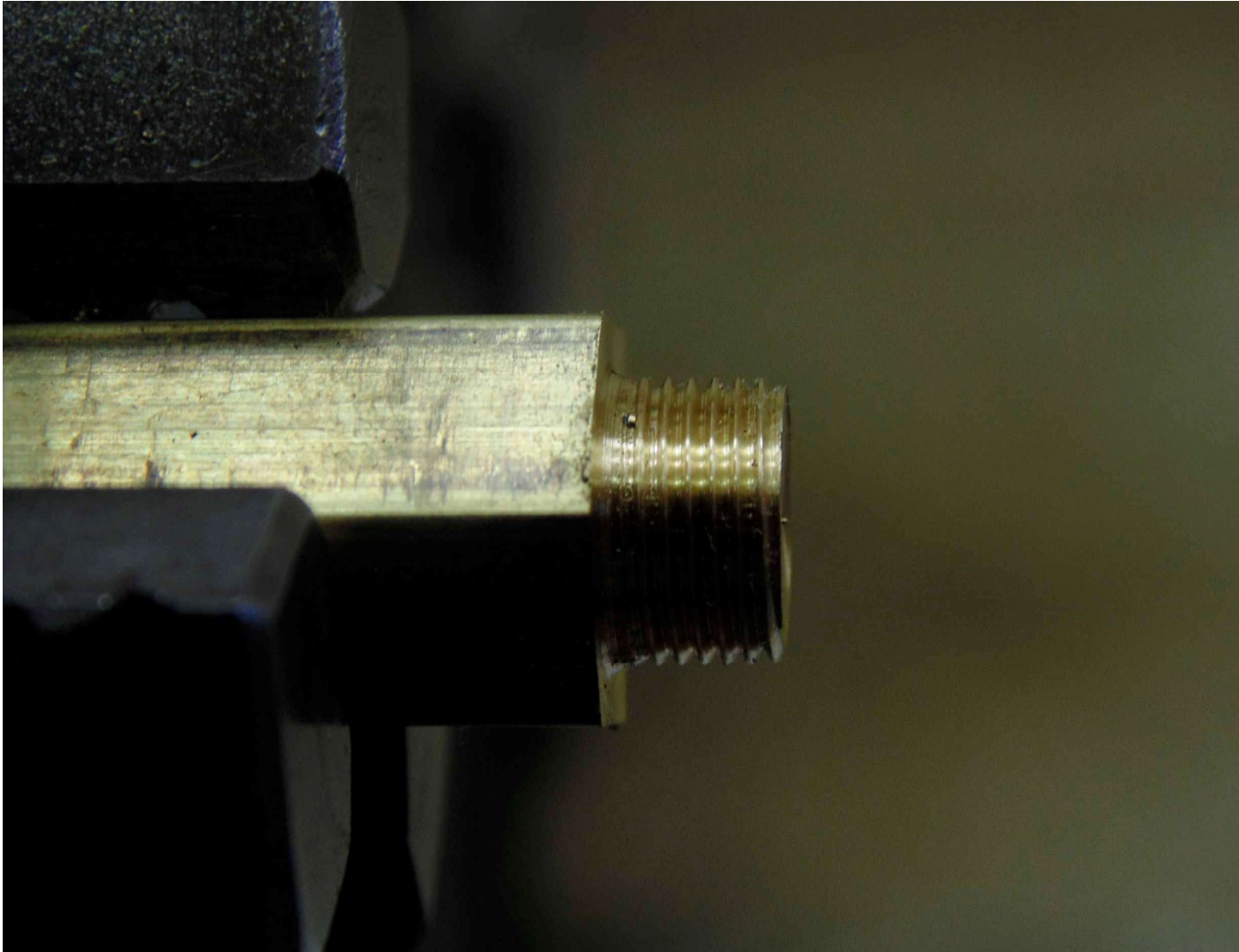
Cutting Threads with a Die



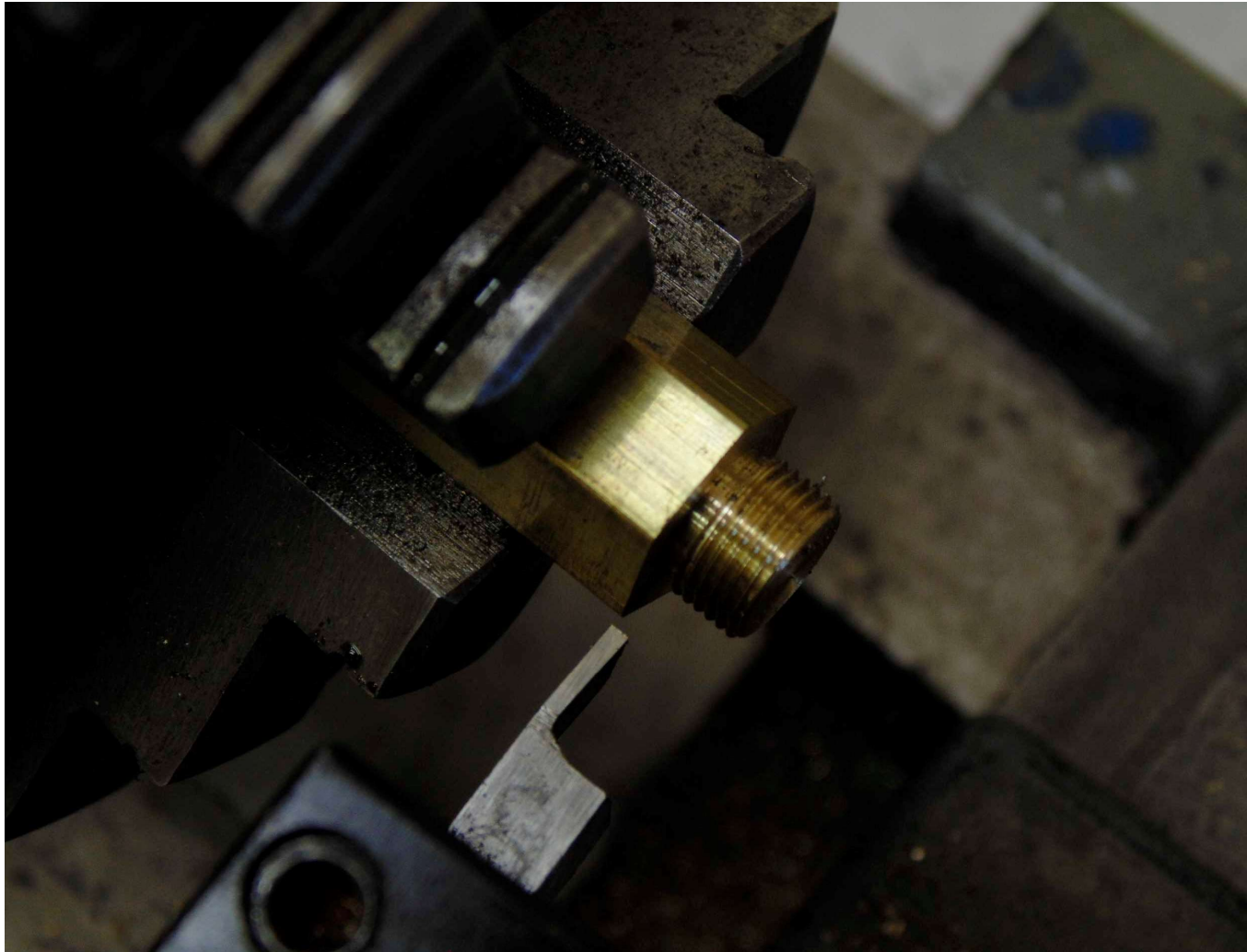
Cutting Threads with a Die



Cutting Threads with a Die

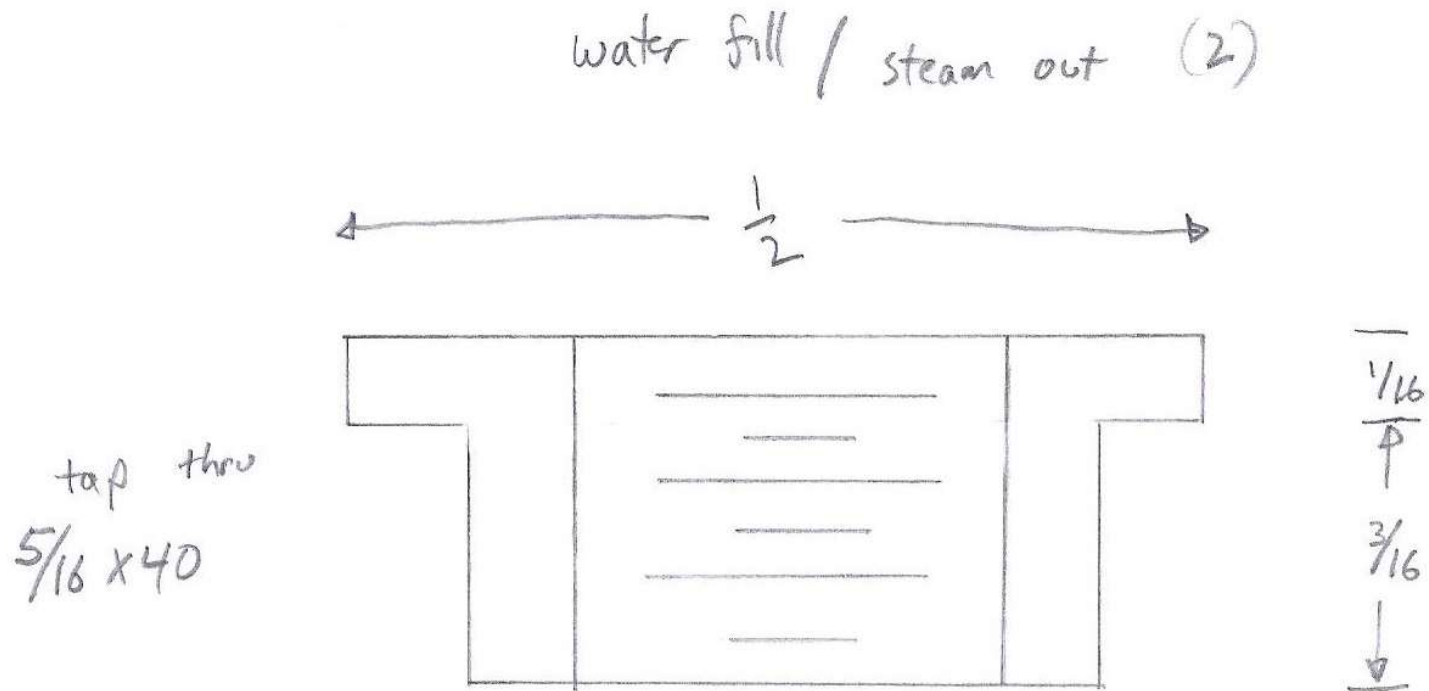


Cutting Threads with a Die



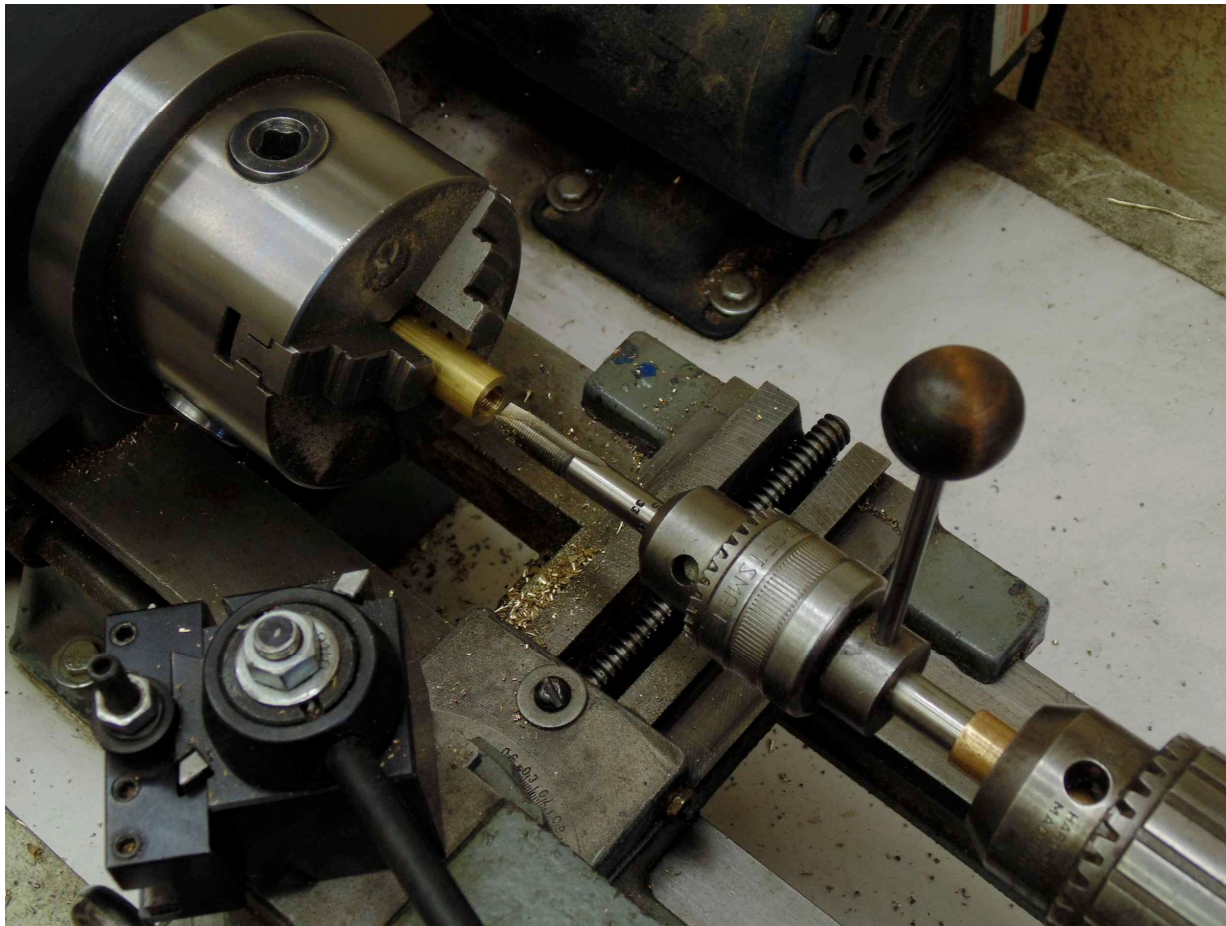
Turning a Boiler Bushing

- Draw the plan.



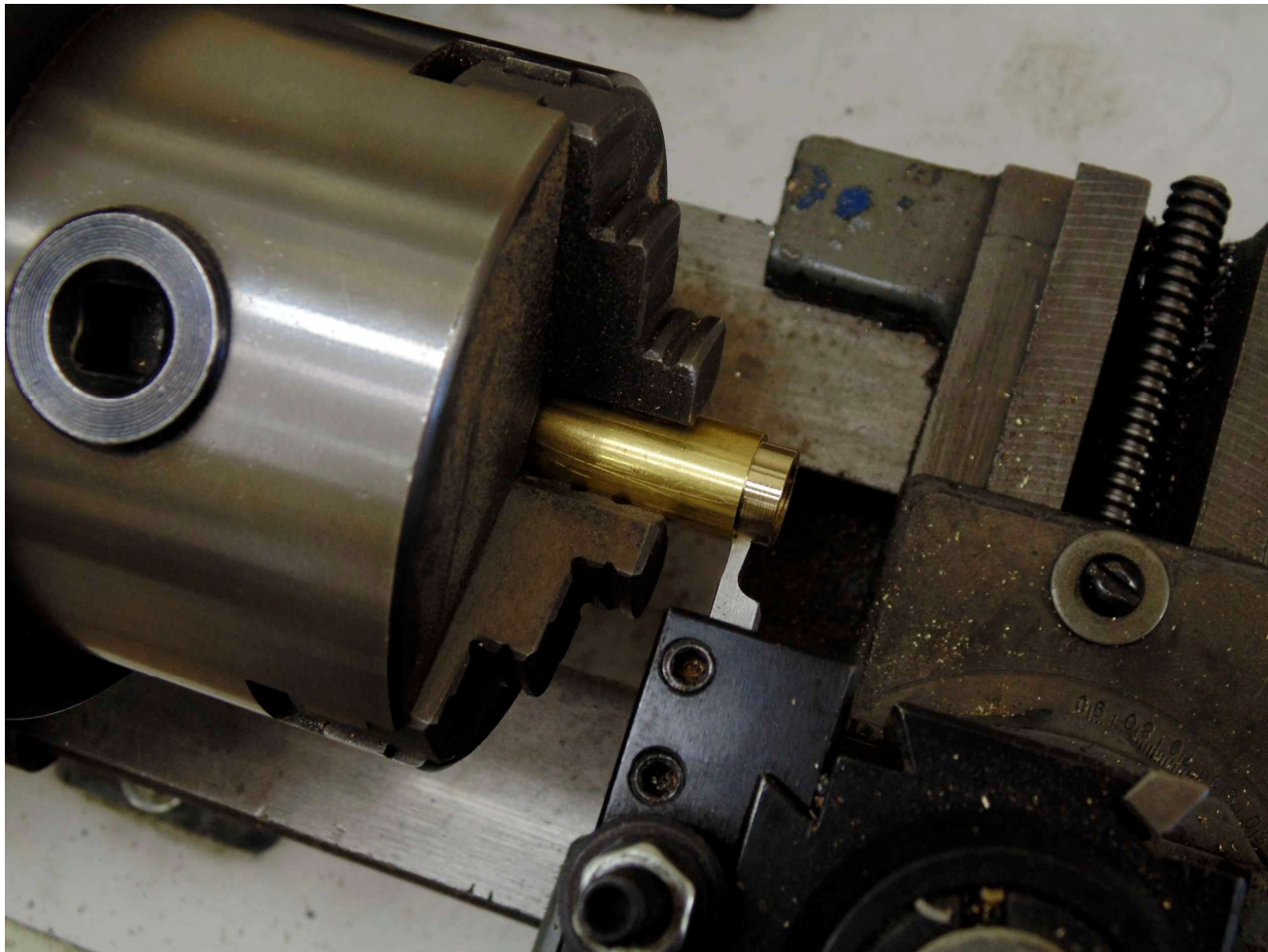
Turning a Boiler Bushing

- Face end, center drill, drill $9/32$ " and tap $5/16$ " x 40 thread



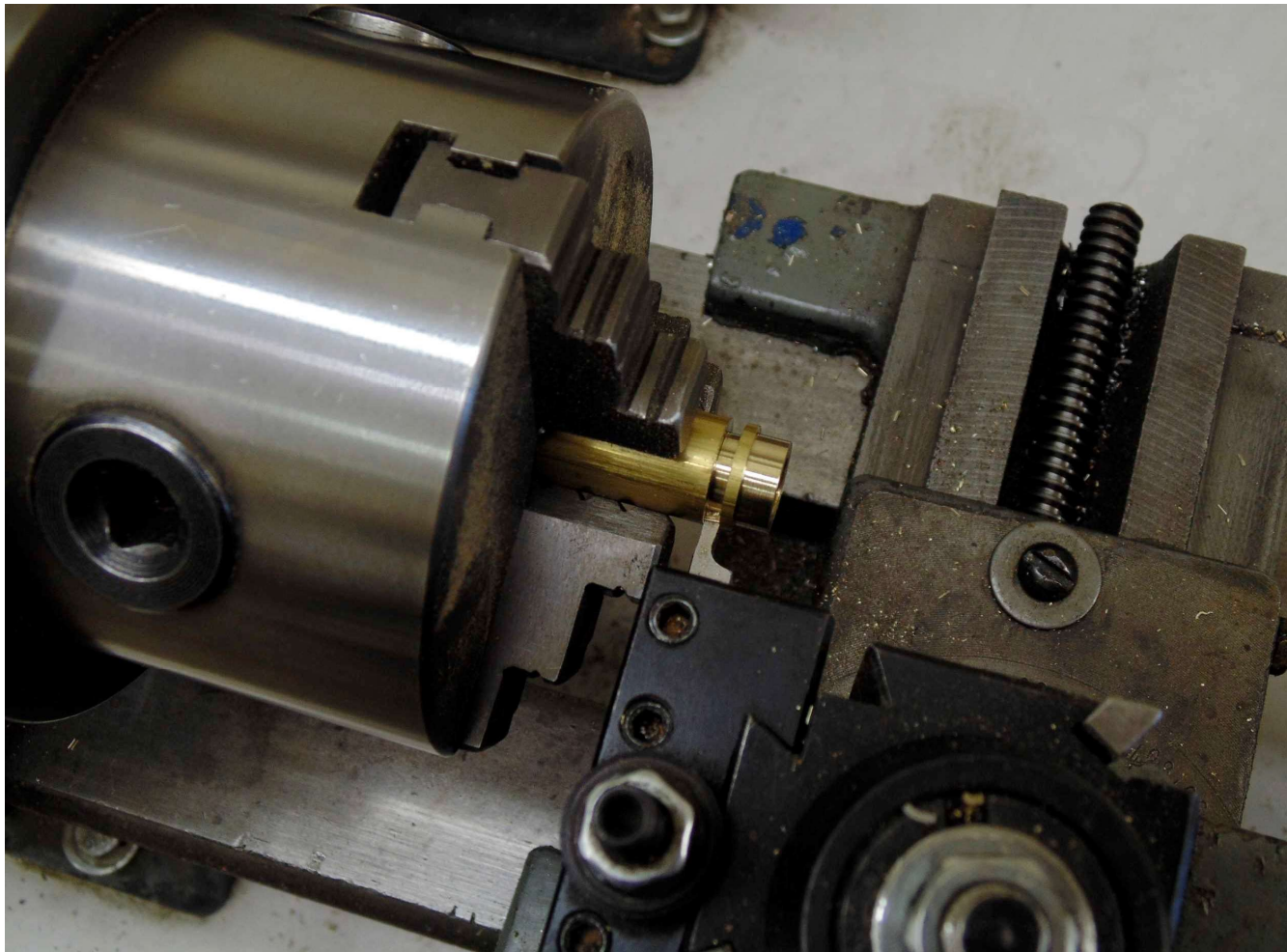
Turning a Boiler Bushing

- Turn shoulder with parting tool.



Turning a Boiler Bushing

- Part bushing off stock.



Turning a Boiler Bushing

- Parting leaves a burr.



Turning a Boiler Bushing

- Make a mandrel.



Turning a Boiler Bushing

- Screw bushing onto mandrel. Face the burr.



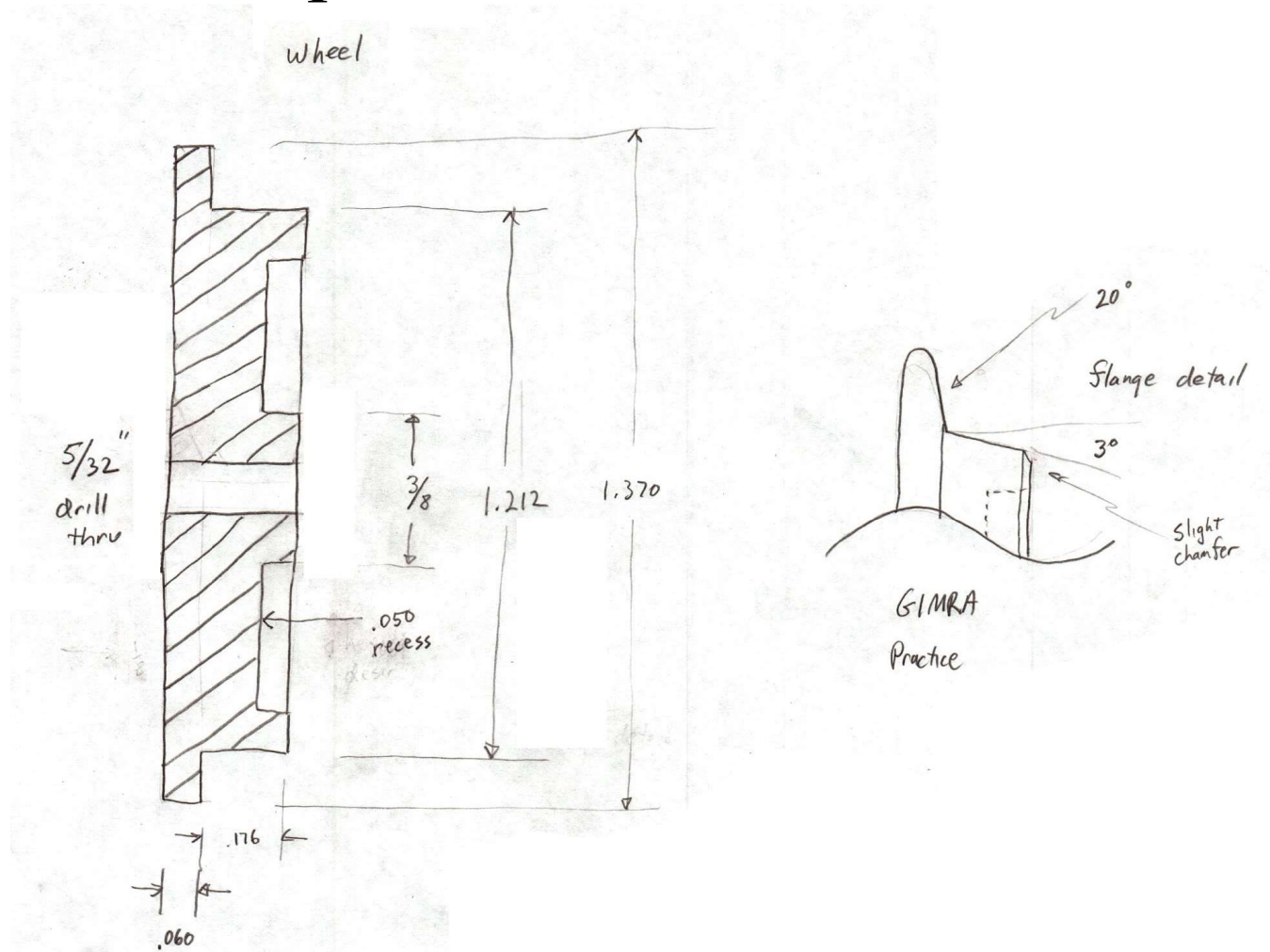
Turning a Boiler Bushing

- Finished bushing.



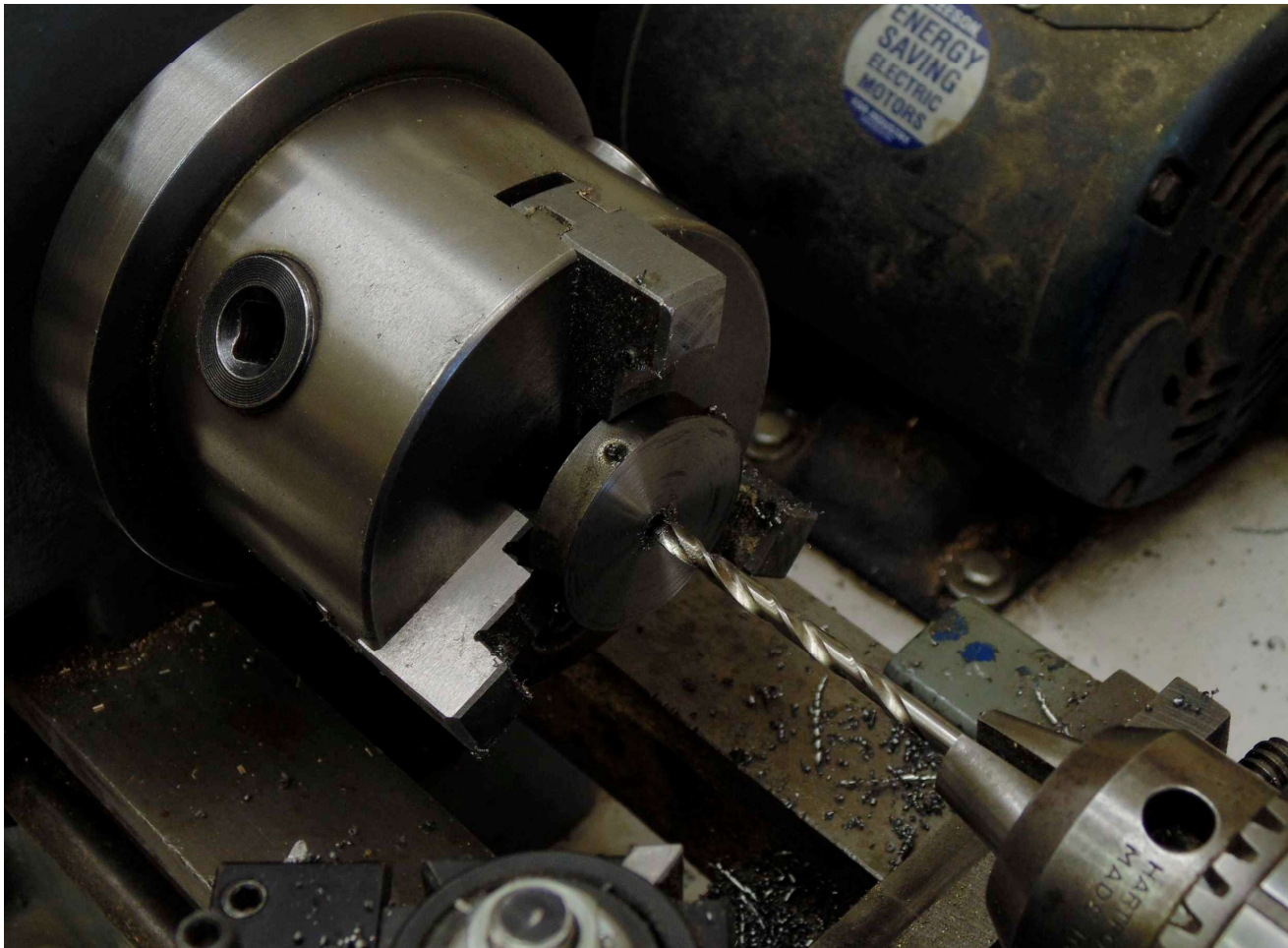
Turning a Wheel

- Draw the plan.



Turning a Wheel

- Drill for axle and face the front.



Turning a Wheel

- Turn tread blank on front.



Turning a Wheel

- Turn decorative recess.



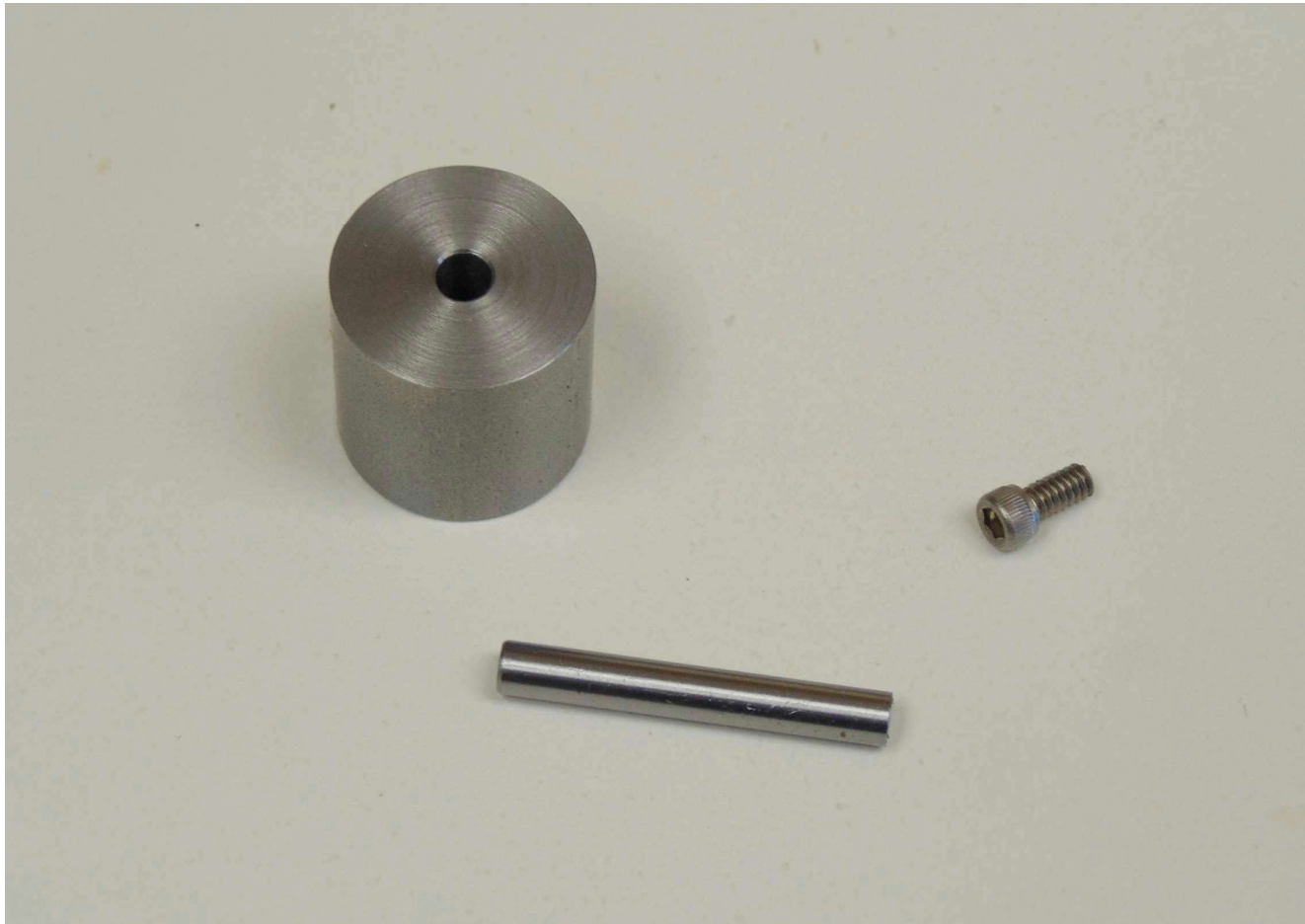
Turning a Wheel

- Face backside of wheel.



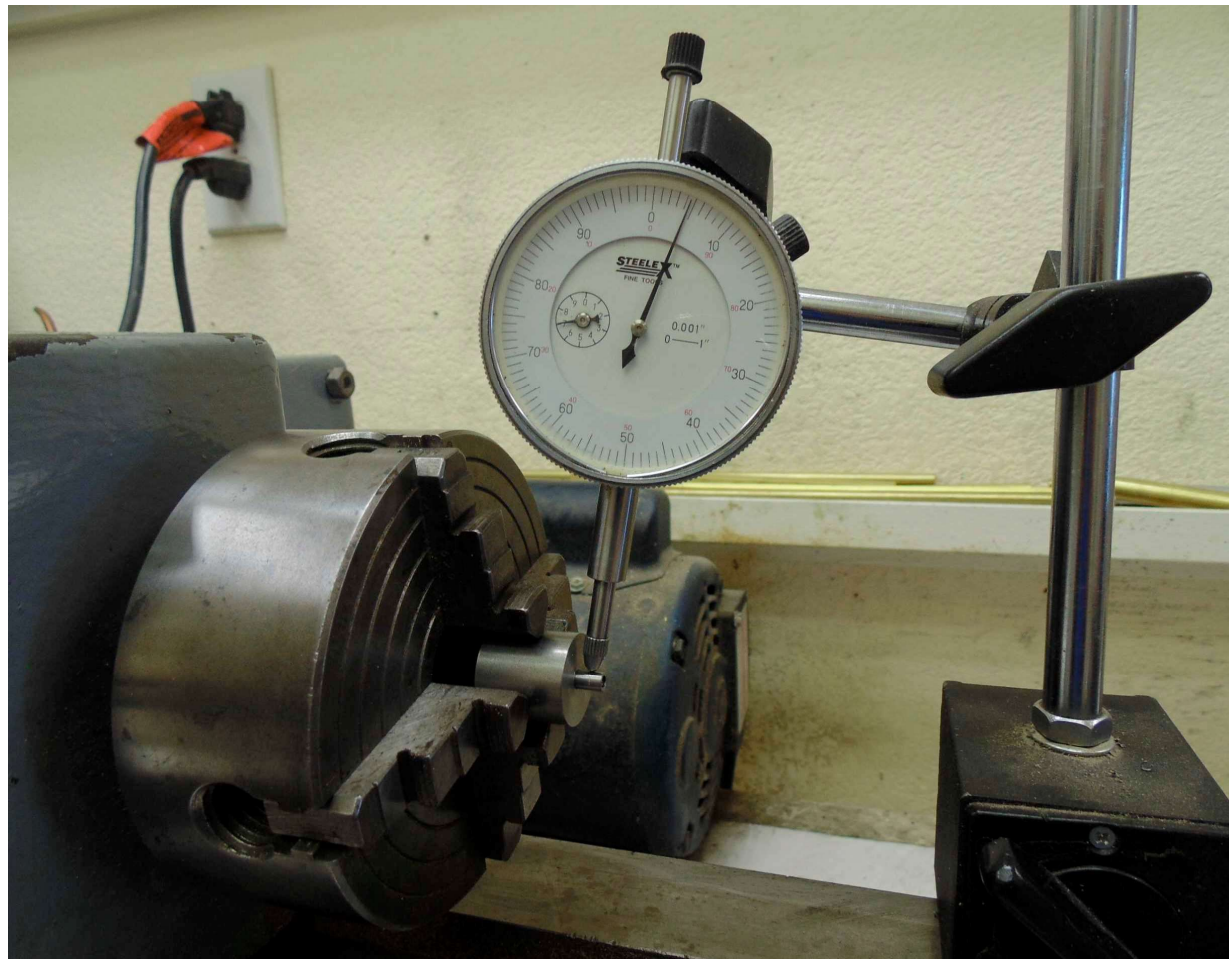
Turning a Wheel

- Fabricate a wheel turning mandrel.



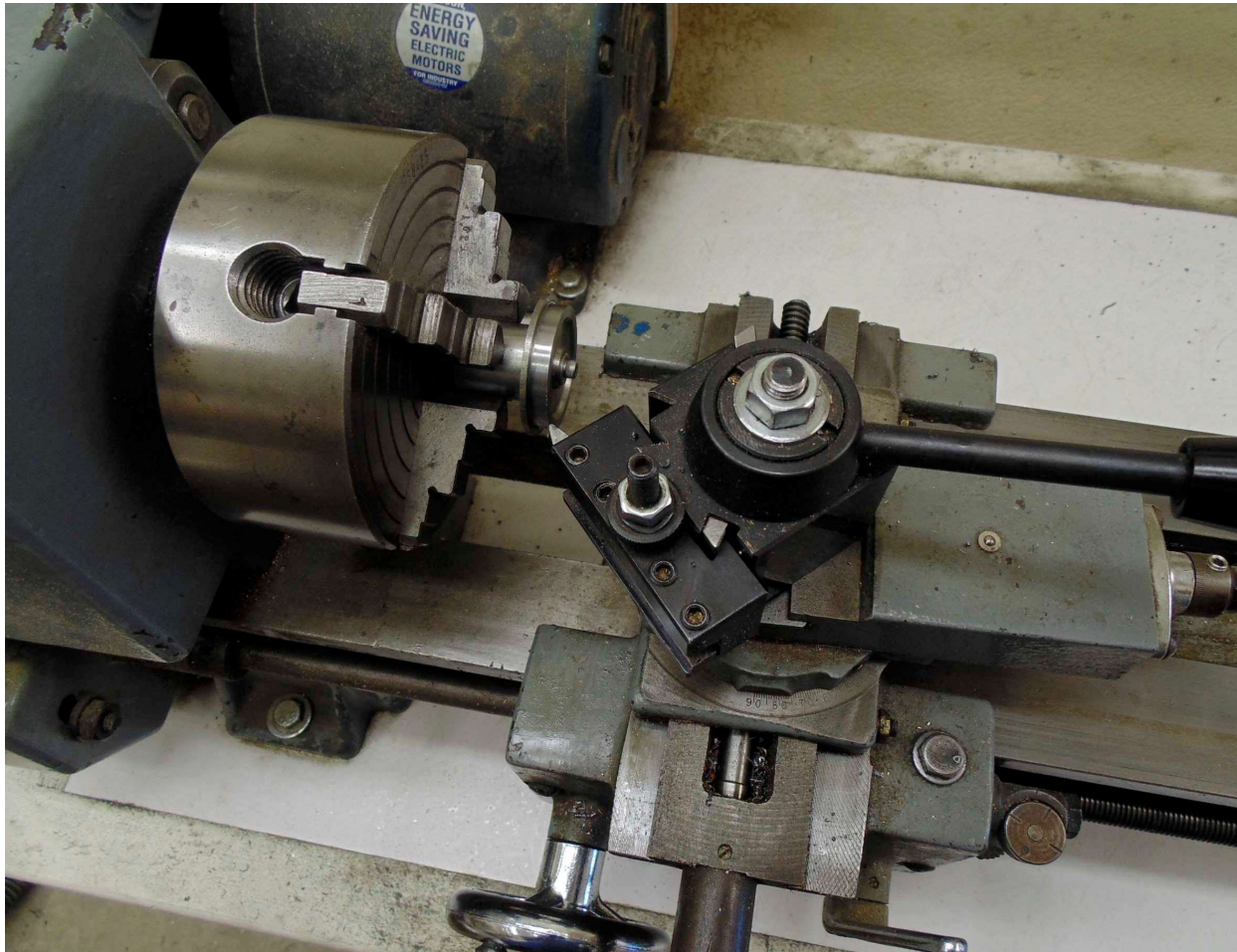
Turning a Wheel

- Center the wheel turning mandrel.



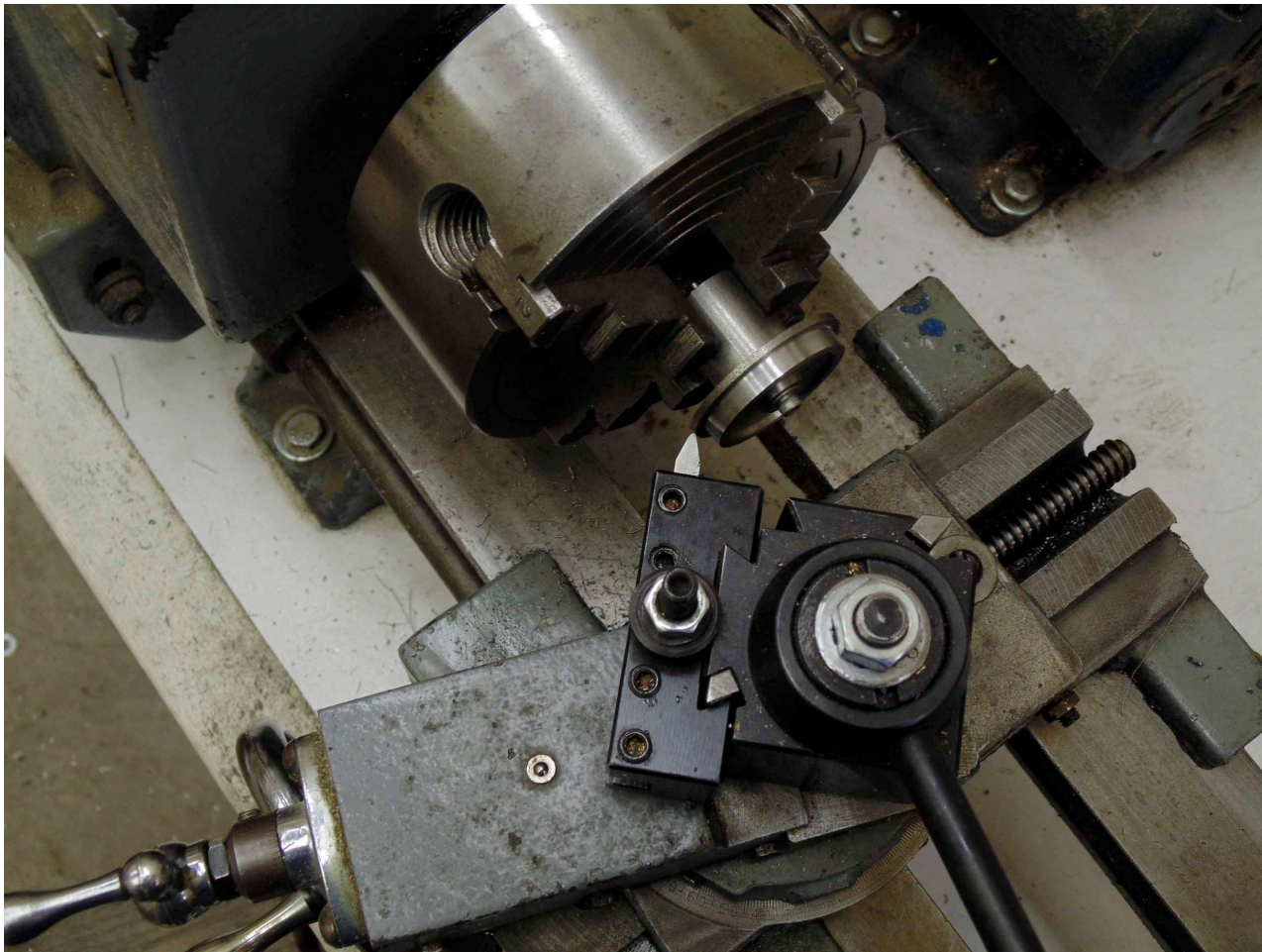
Turning a Wheel

- Turn 3° wheel tread.



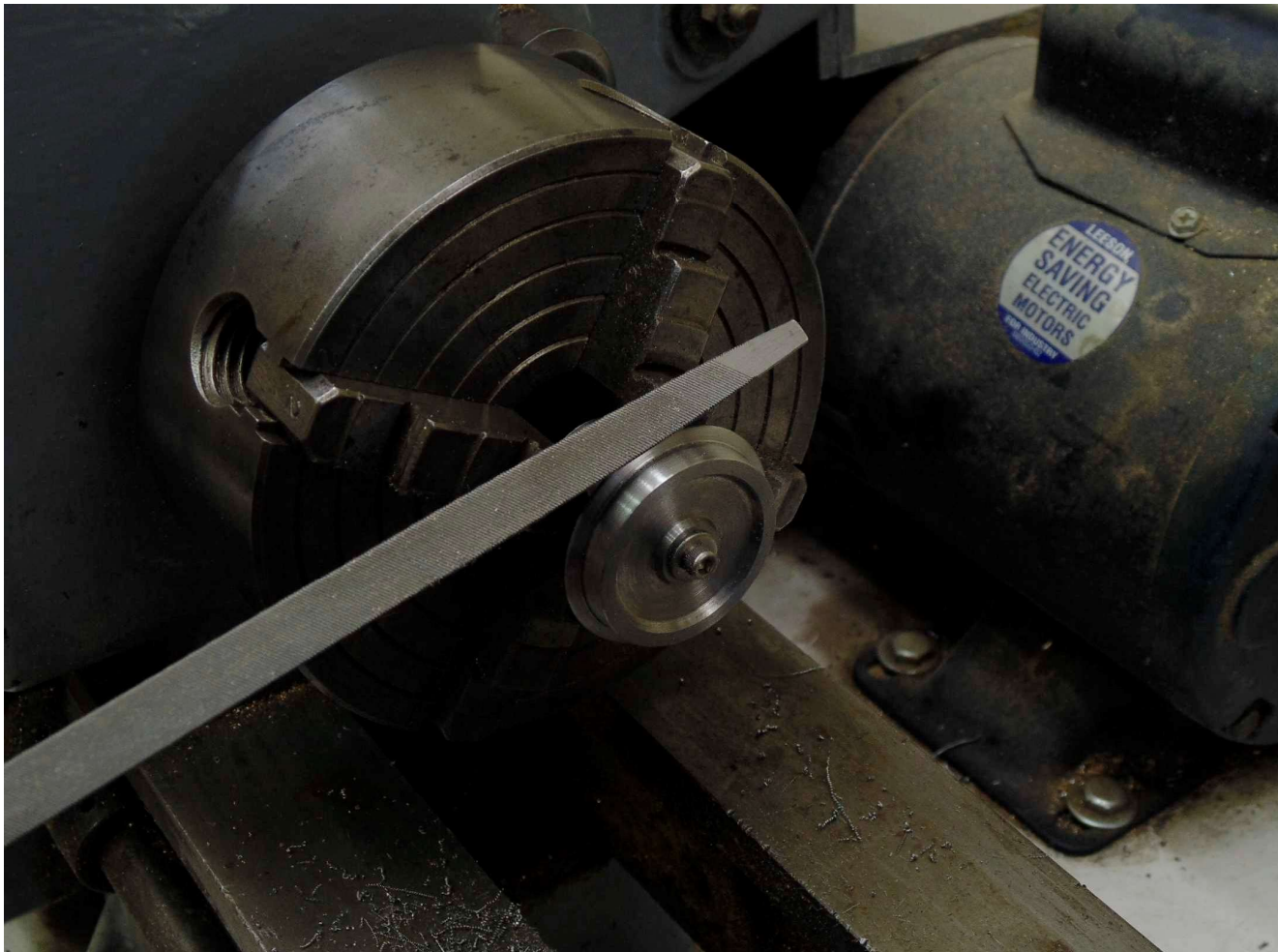
Turning a Wheel

- Turn 20° wheel flange.



Turning a Wheel

- Chamfer wheel edge and round over flange.



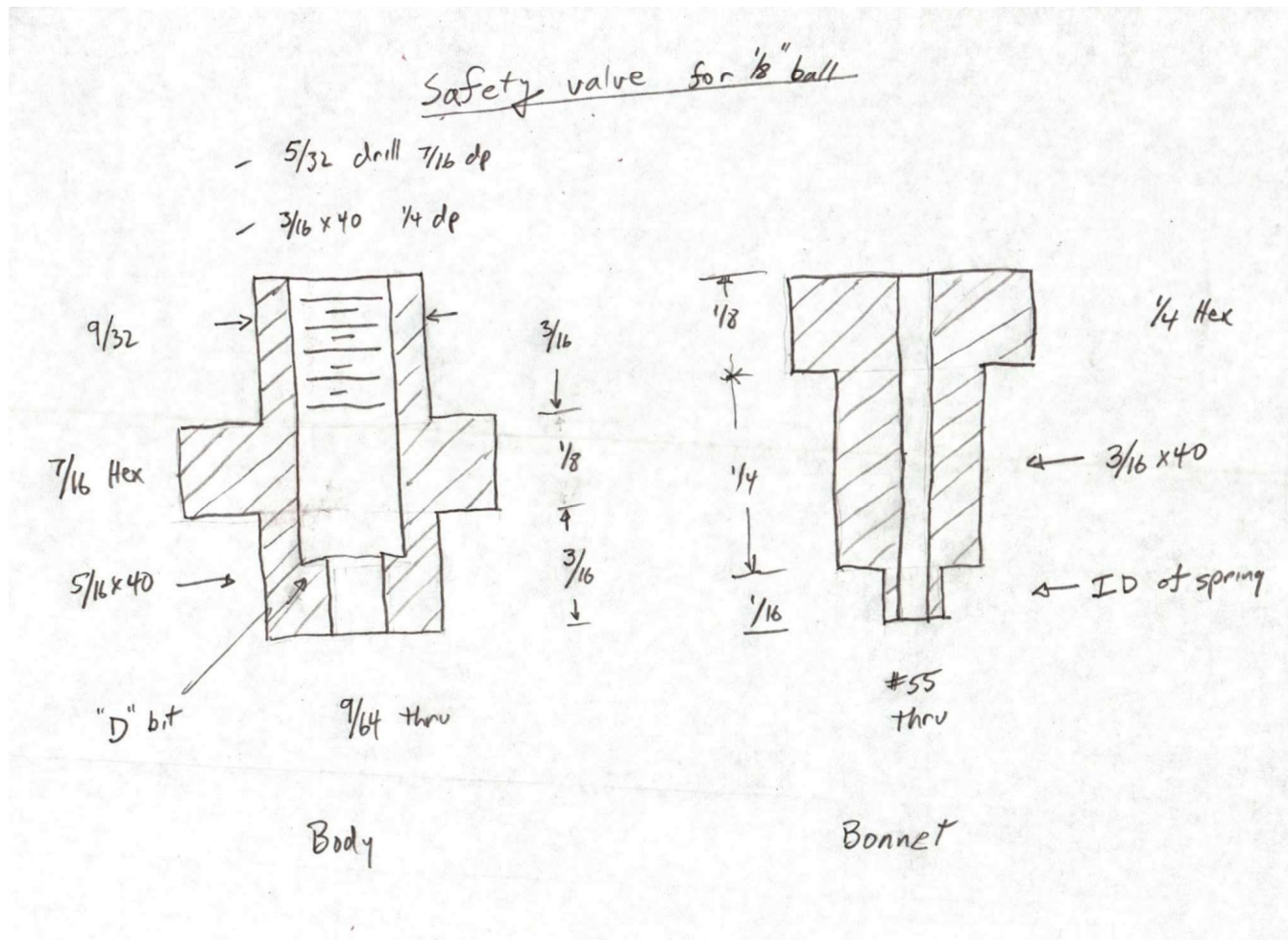
Turning a Wheel

- Finished. Repeat many times.



Making a Safety Valve

- The plan.



Making a Safety Valve

- Valve body start.



Making a Safety Valve

- Mandrel for the valve body.



Making a Safety Valve

- Turn outside of the valve body.



Making a Safety Valve

- Drill the valve body.



Making a Safety Valve

- The “D” bit.



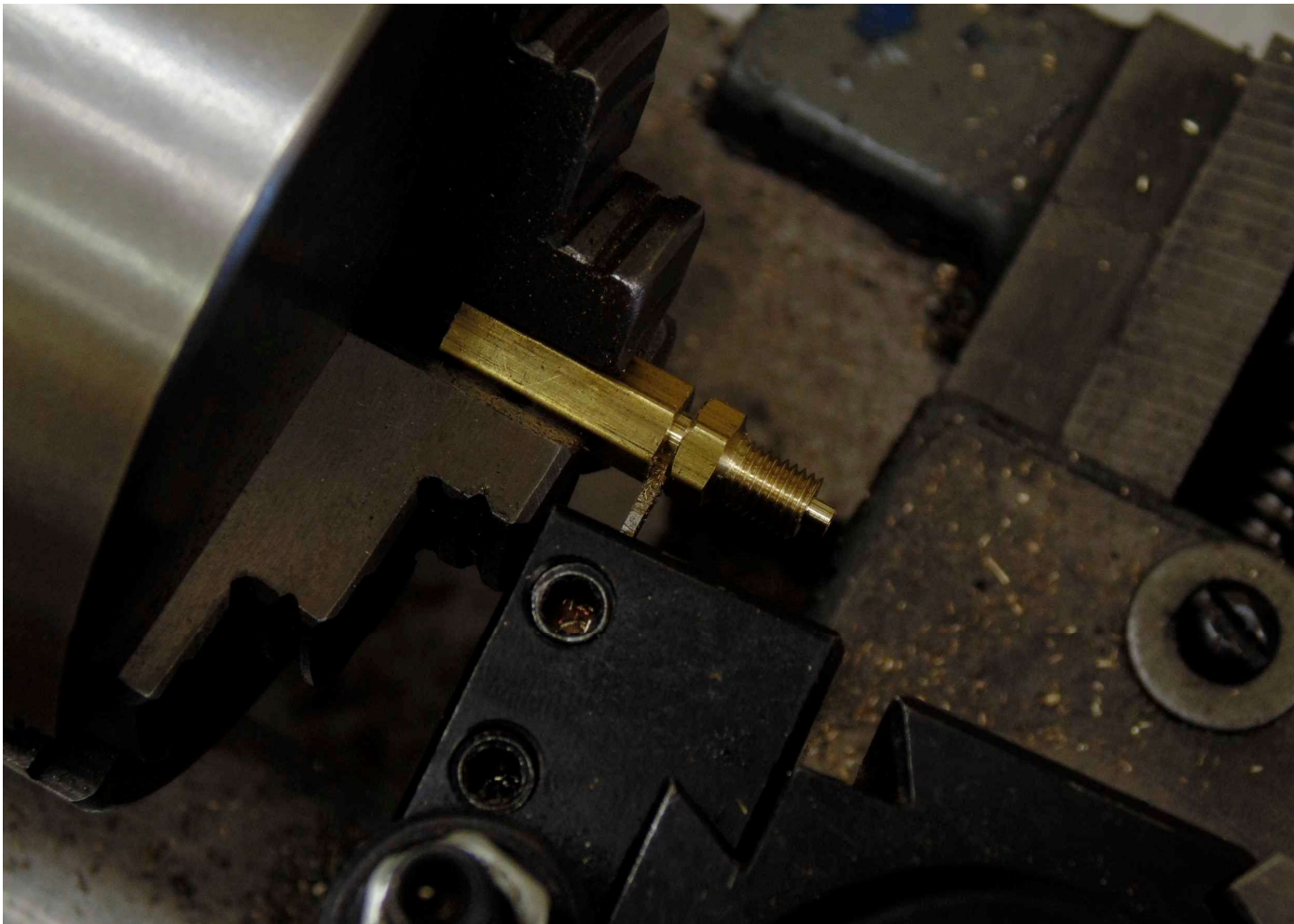
Making a Safety Valve

- Tapping the valve body.



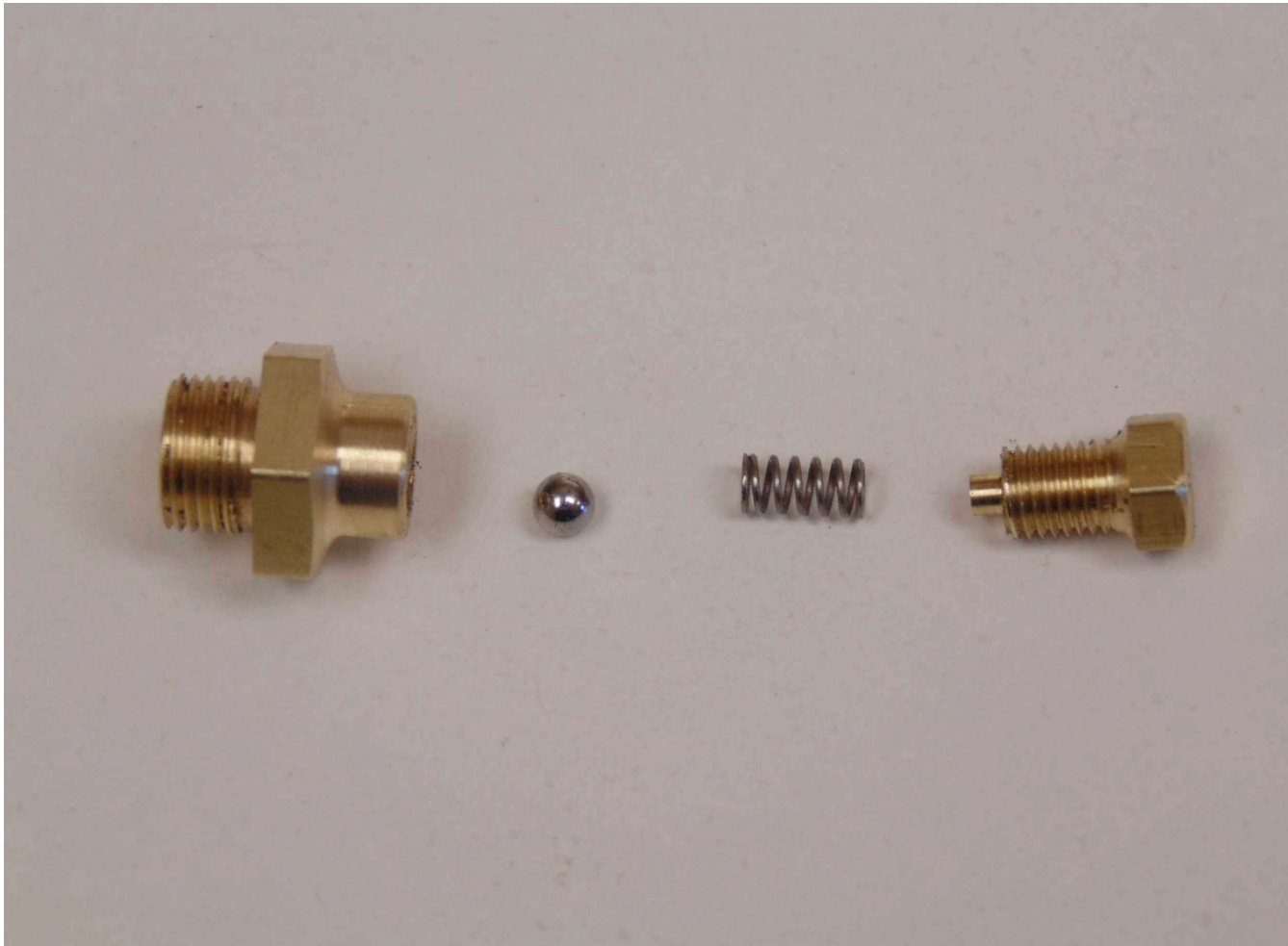
Making a Safety Valve

- Machining the bonnet.



Making a Safety Valve

- All the parts.



Making a Safety Valve

- Finished valve.



Questions??