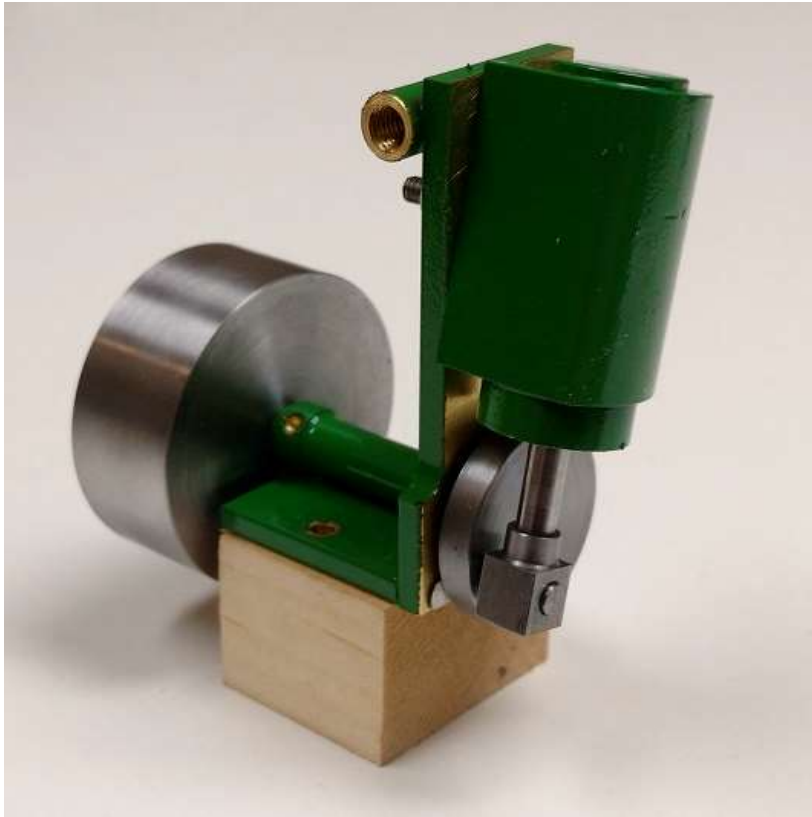


# Building a Simple Steam Engine

Bob Sorenson

# Objective

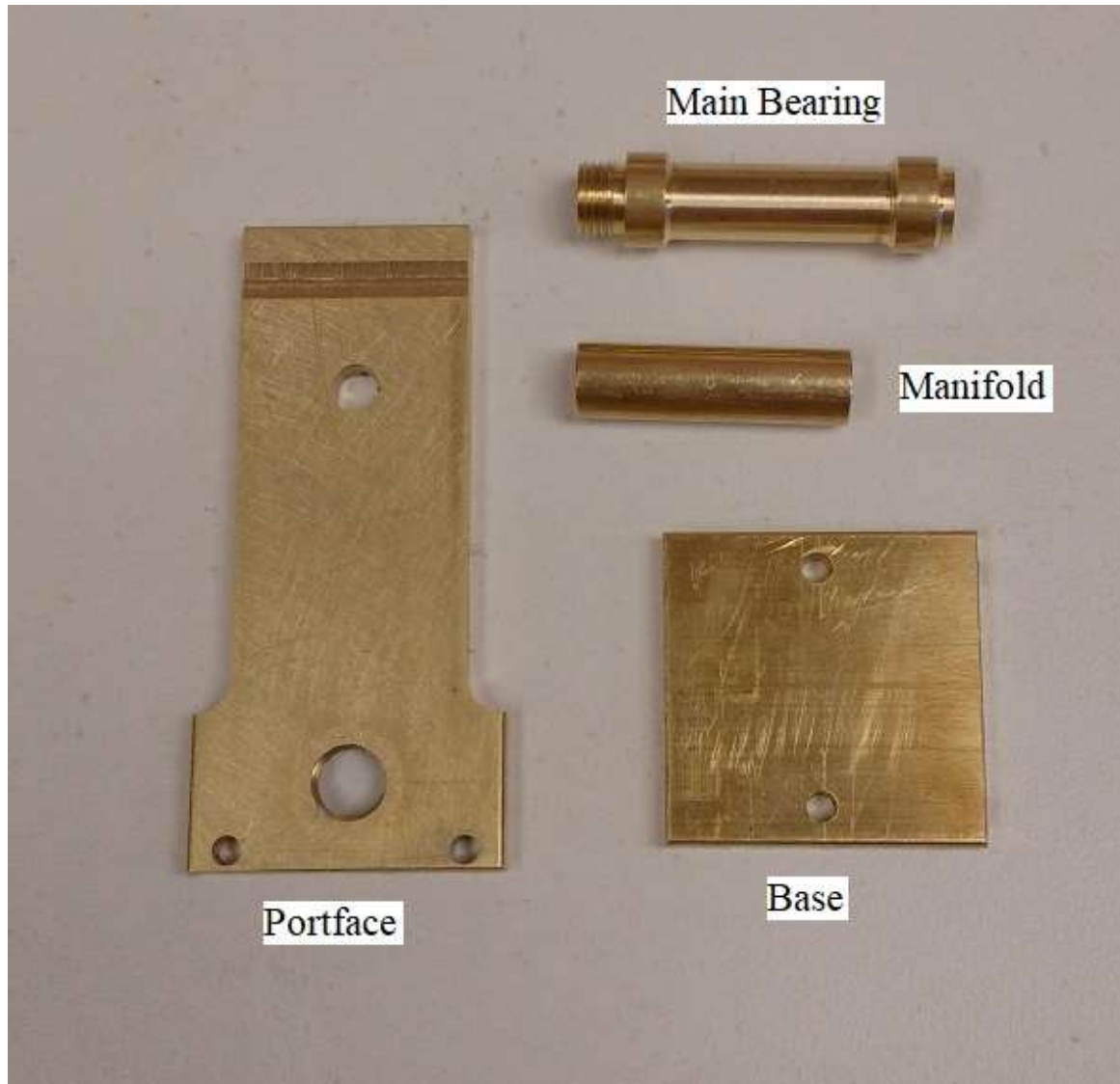


Single Acting Oscillating,  $7/16$ " bore,  $5/8$ " stroke

# Engine Standard

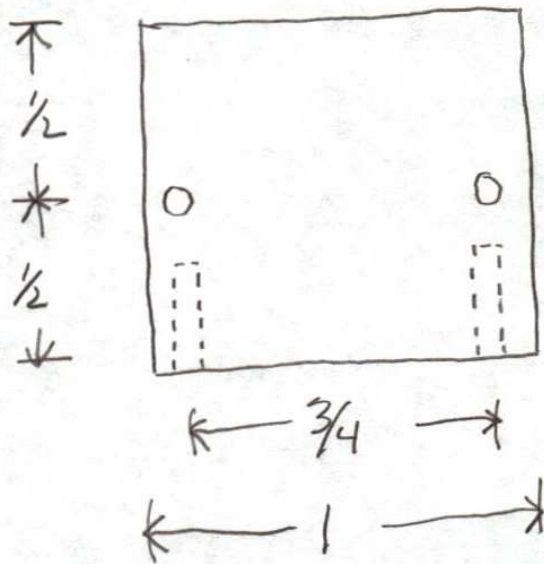


# Engine Standard



# Engine Base

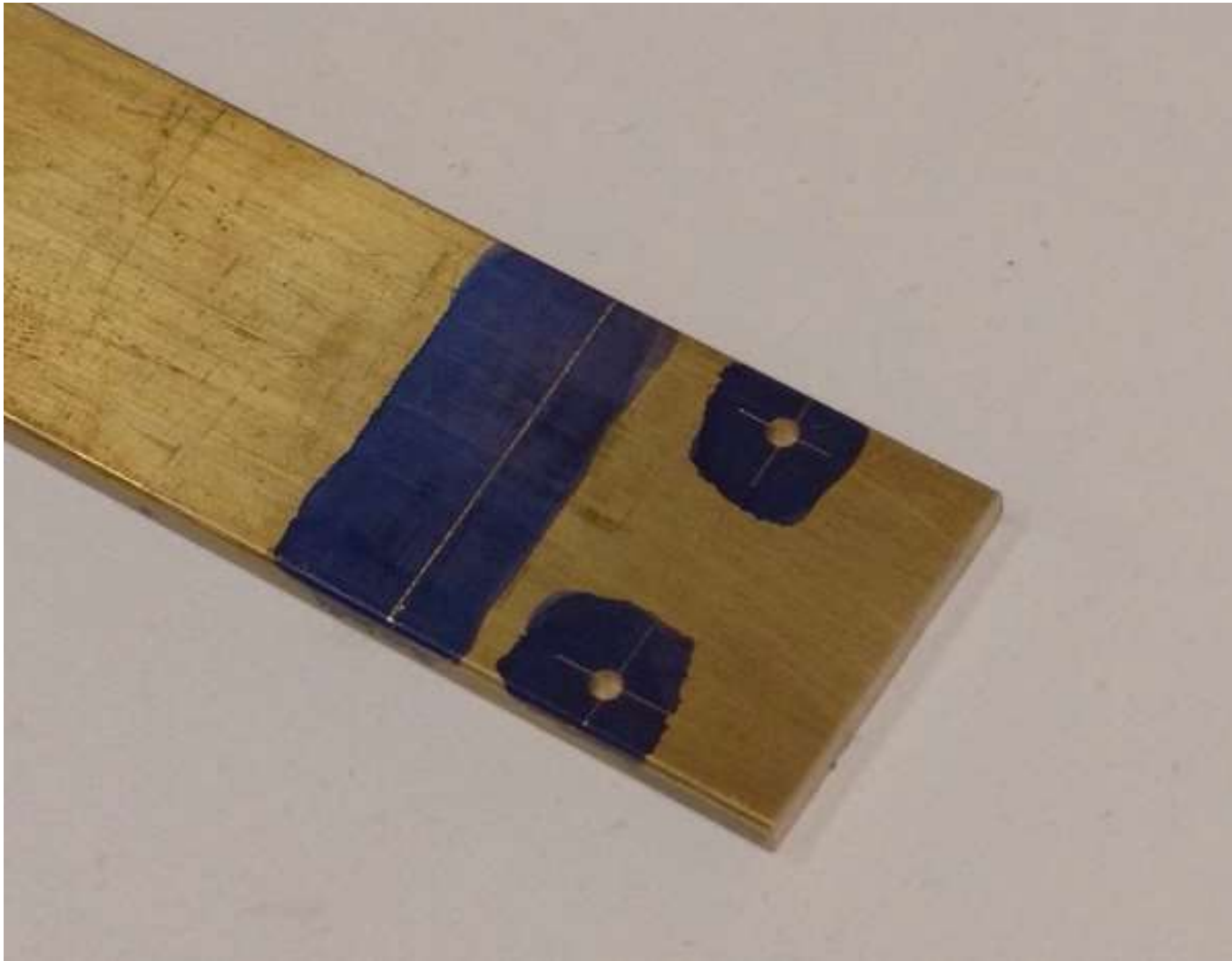
Base 1/8" Brass



#42 Drill 2 places

2x56 1/4 dp  
2 places

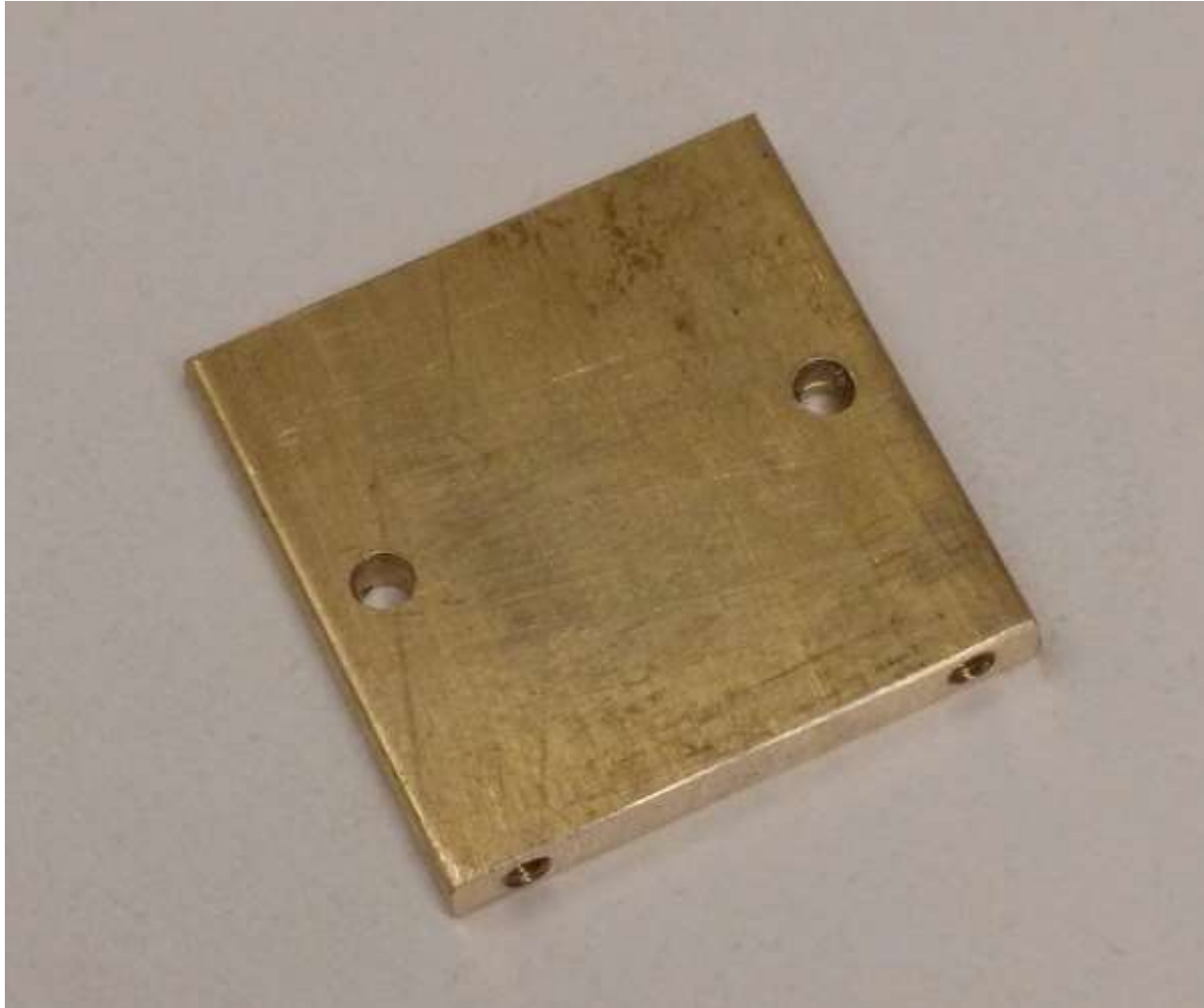
# Engine Base



# Engine Base



# Engine Base

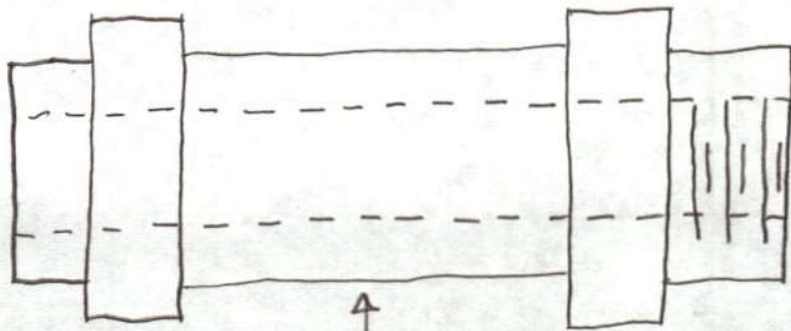




# Main Bearing

main bearing  $\frac{5}{16}$  Round Brass

$\frac{1}{16}$  |  $\frac{1}{8}$  |  $\frac{3}{4}$  |  $\frac{1}{8}$  |  $\frac{5}{32}$



$\frac{1}{4} \times 40$

#21 Drill thru

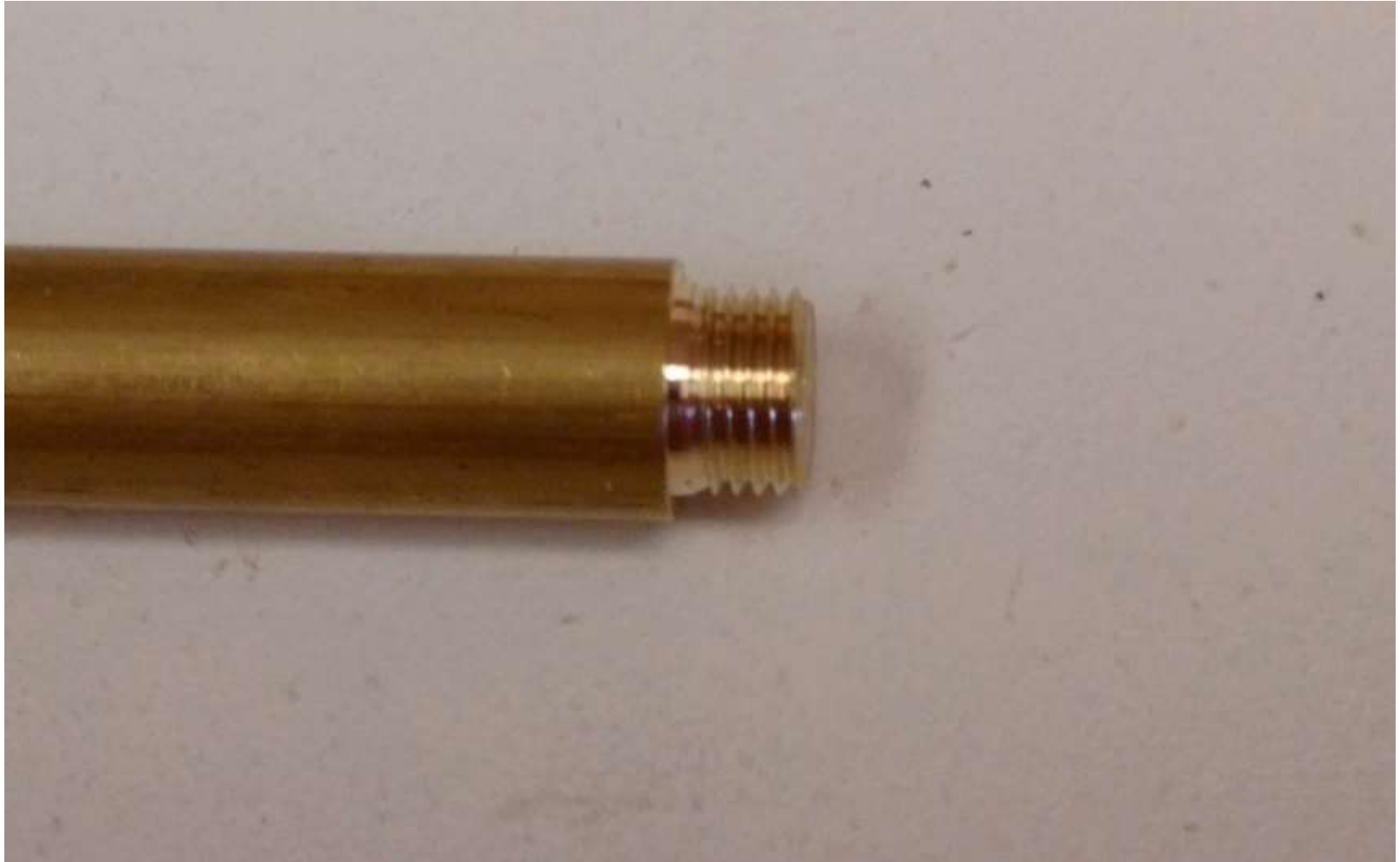
# Main Bearing



# Main Bearing



# Main Bearing



# Main Bearing



# Main Bearing



# Main Bearing



# Main Bearing

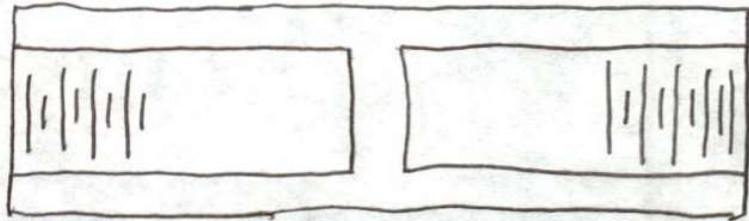
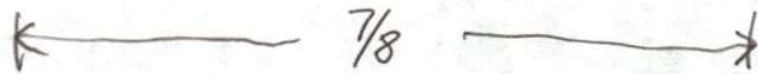




# Steam Manifold

manifold  $\frac{1}{4}$  Round Brass

$\frac{7}{8}$



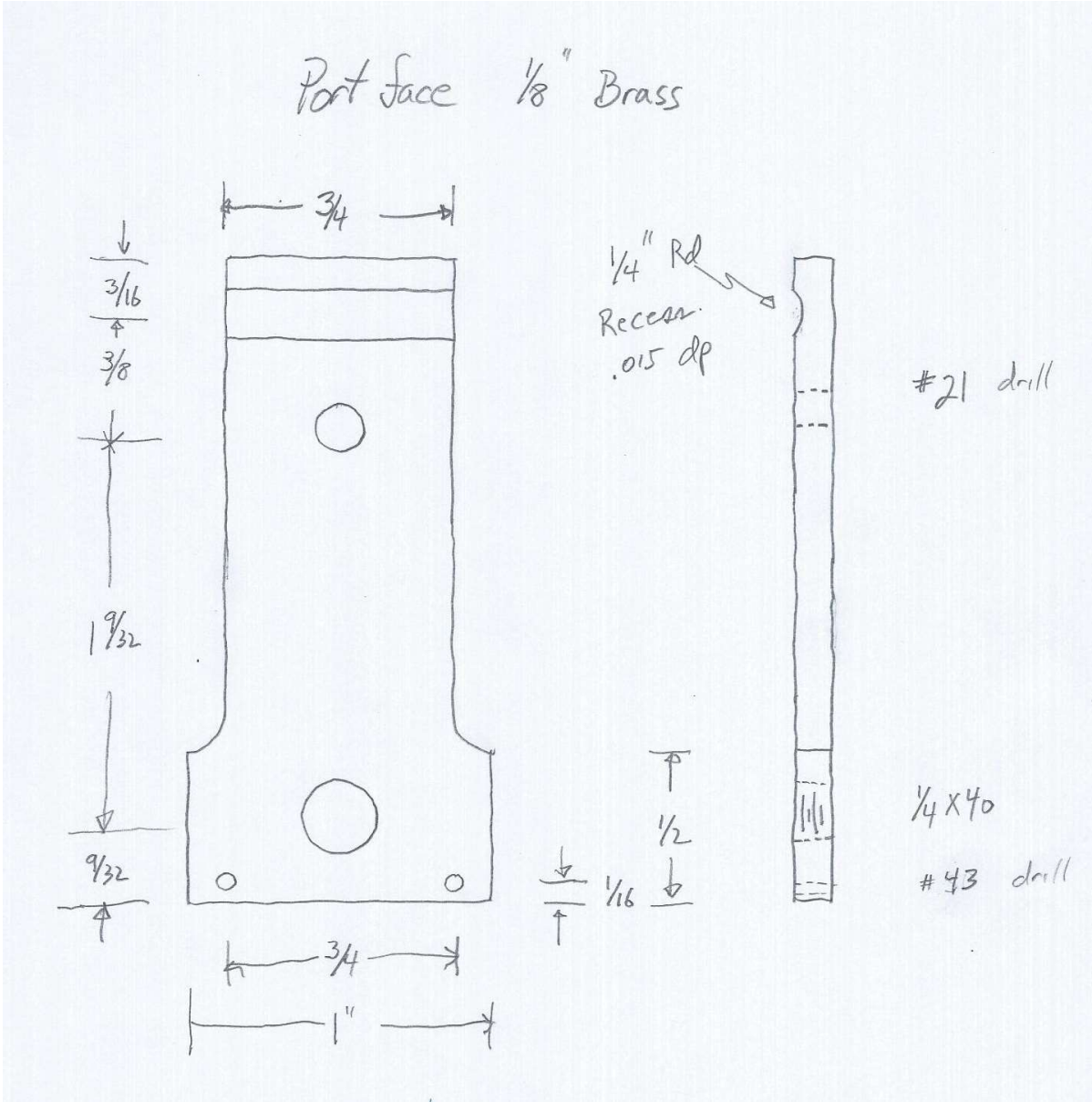
- Tap  $\frac{3}{16} \times 40$  Both ends  
 $\frac{17}{32}$  dp

- Do not break thru

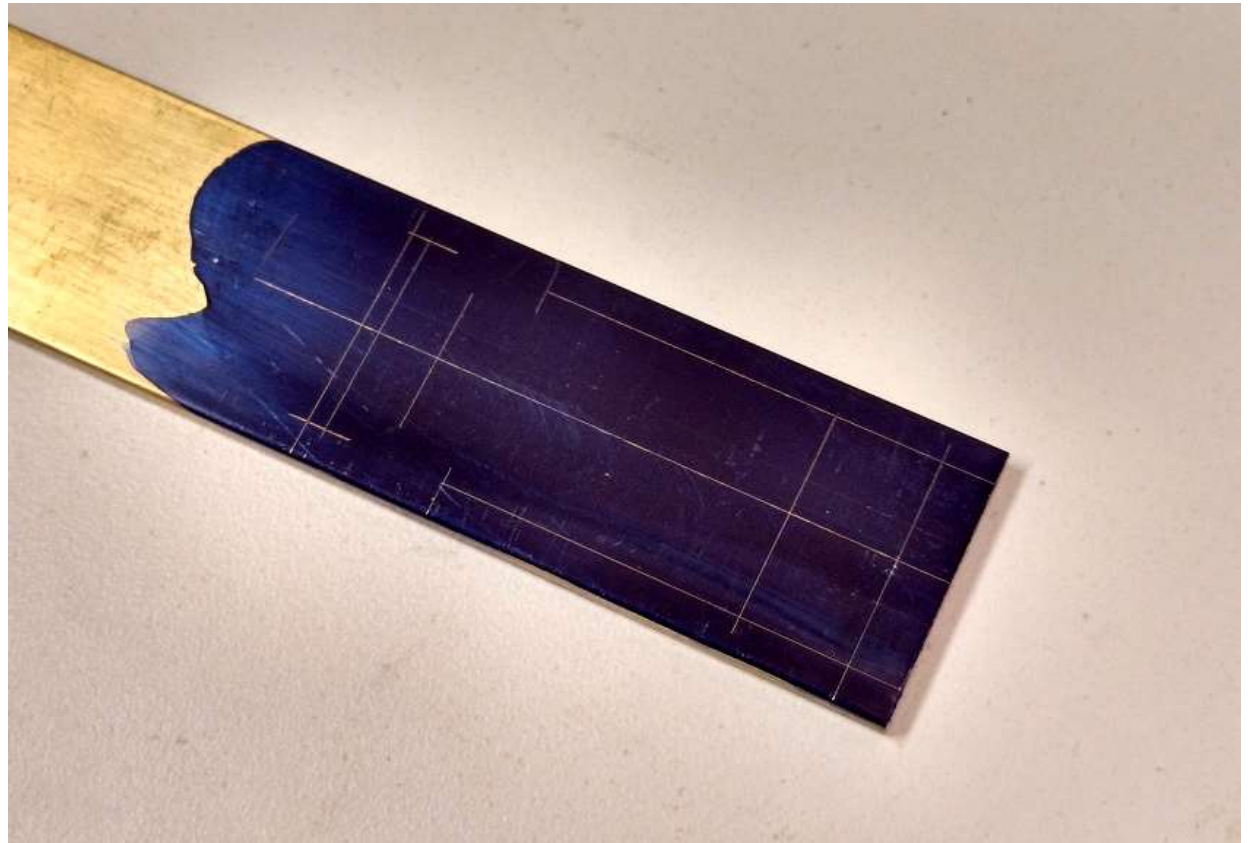
# Steam Manifold



# Portface



# Portface



Homework Assignment: Study “Machinist Layout Techniques”

# Portface



# Portface



# Portface



# Portface





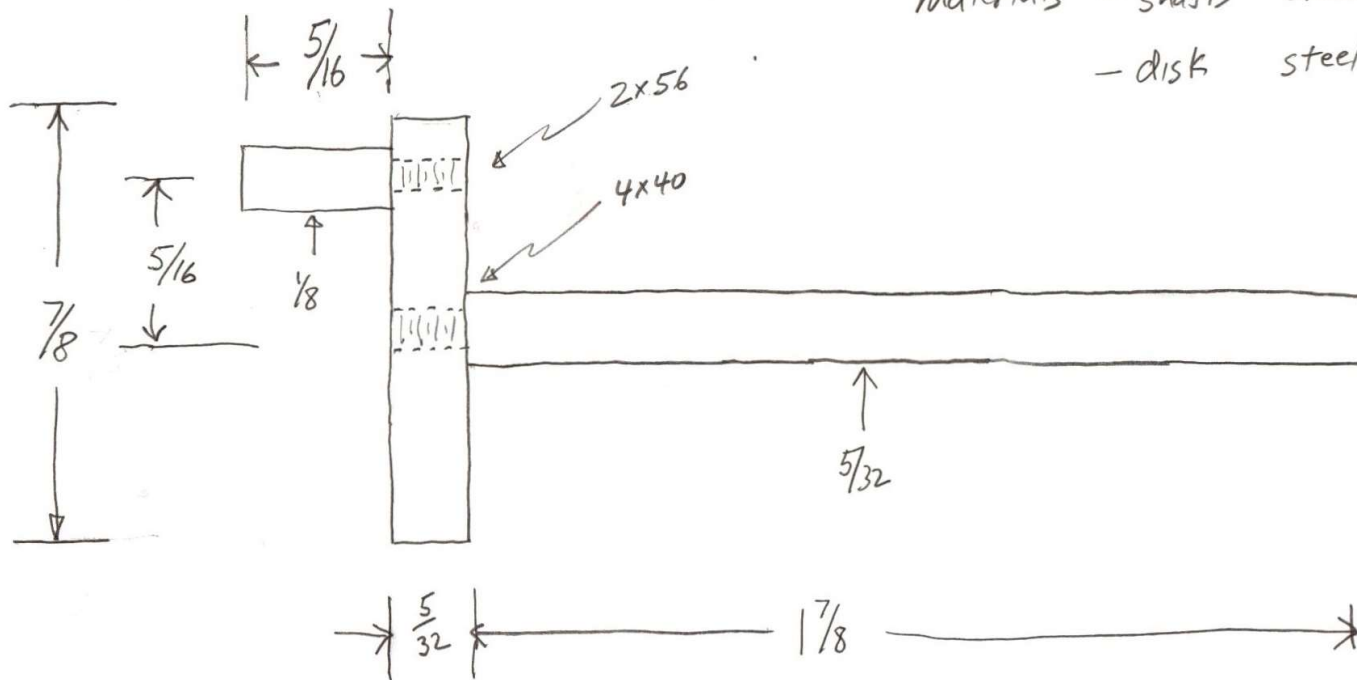
# Engine Standard



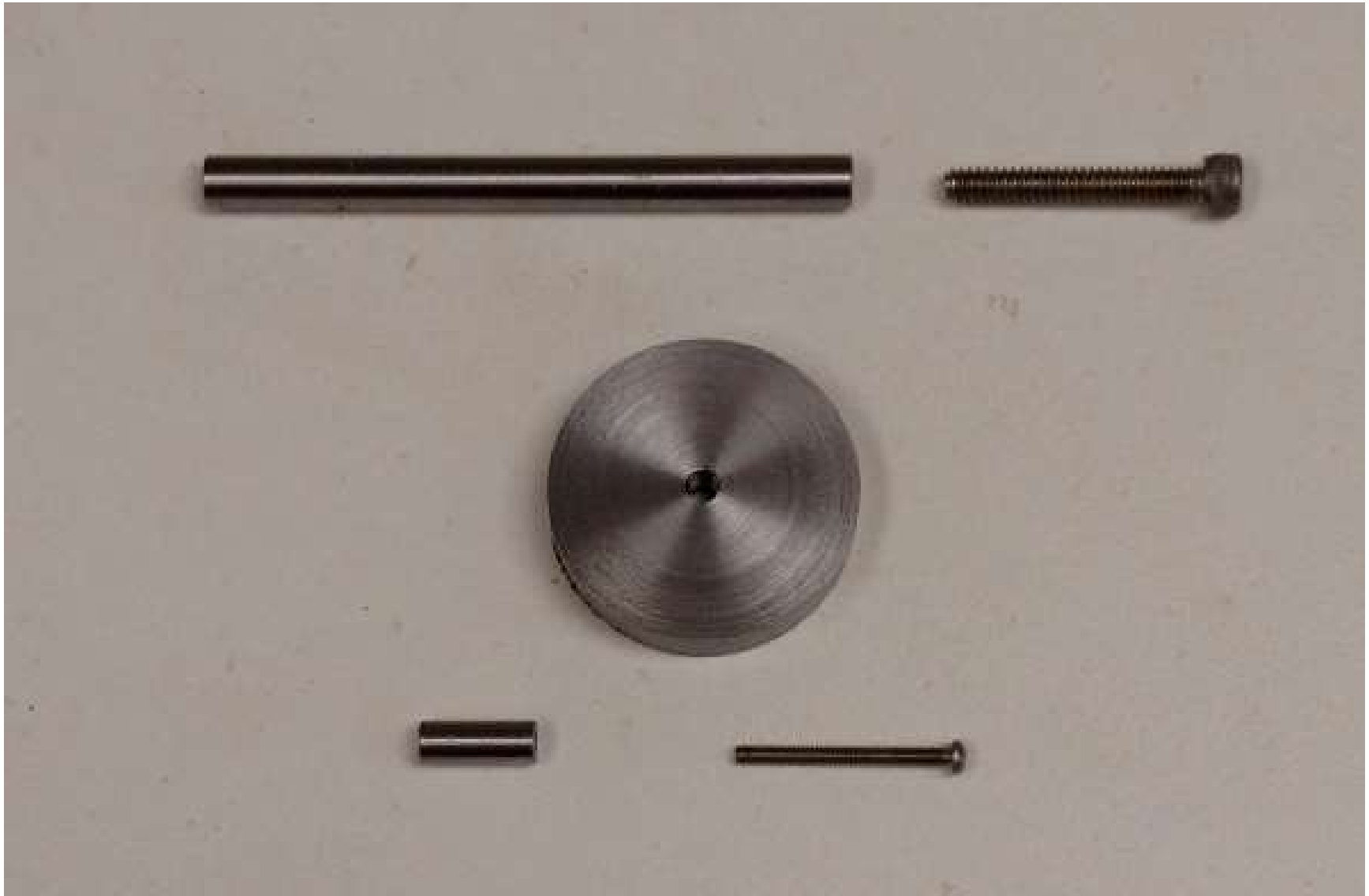
# Crankshaft

Crankshaft

materials - shafts Ground & Polished  
- disk steel, brass



# Crankshaft



# Crankshaft



# Crankshaft

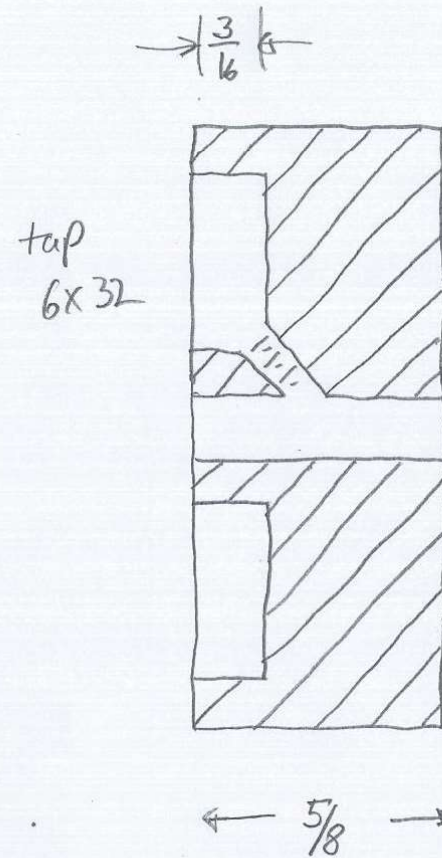
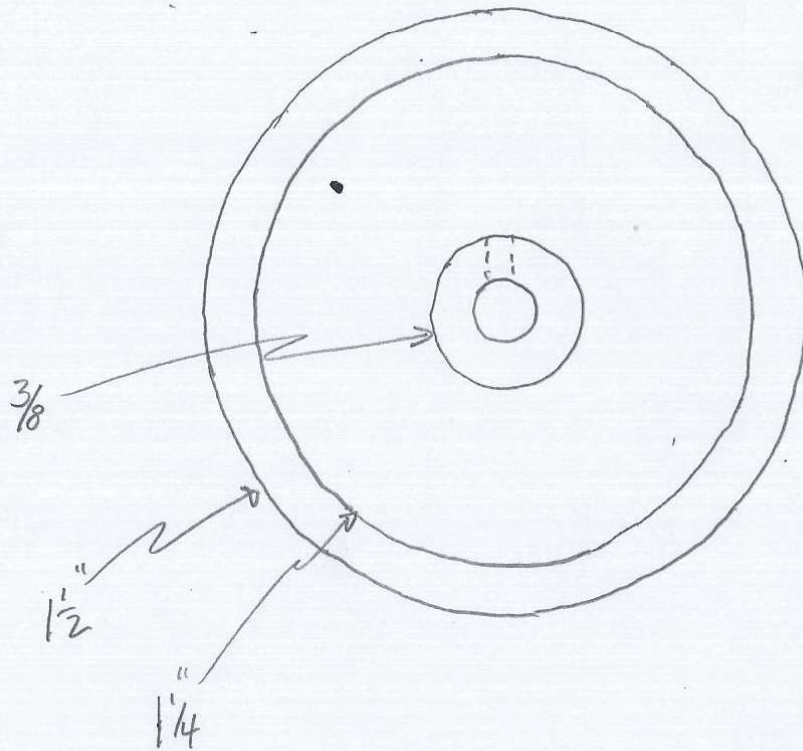


# Crankshaft



# Flywheel

Flywheel steel, Brass, Cf, SS



# Flywheel

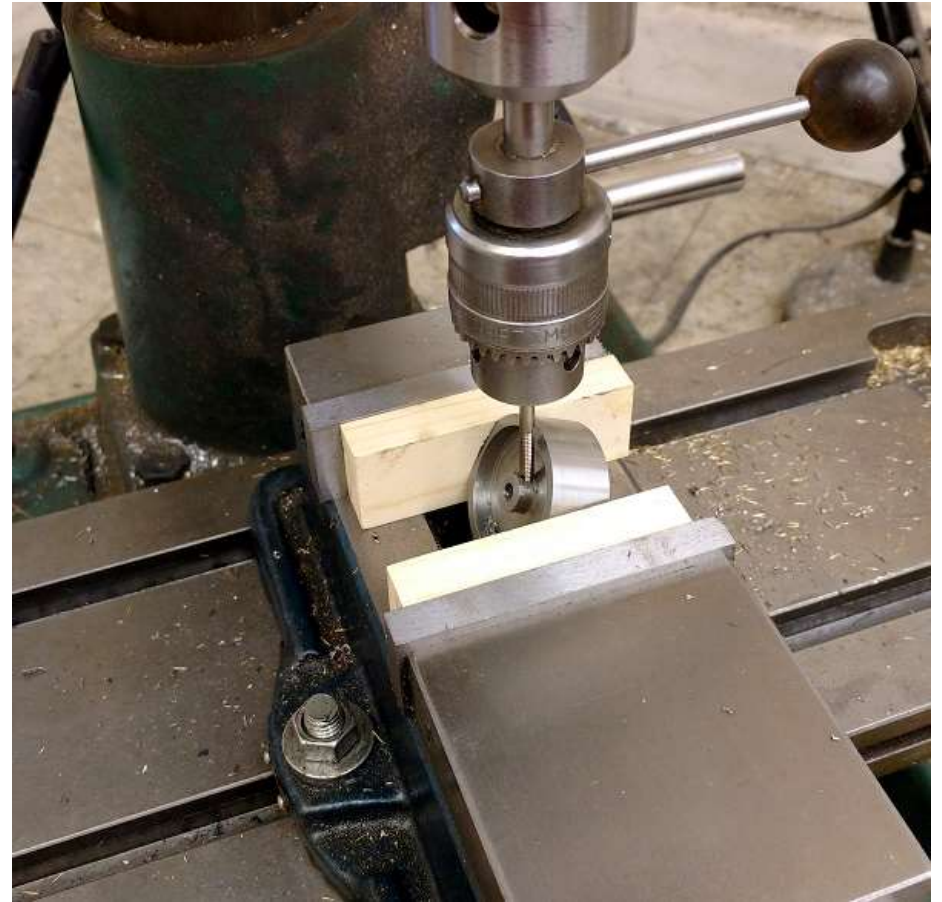




# Flywheel



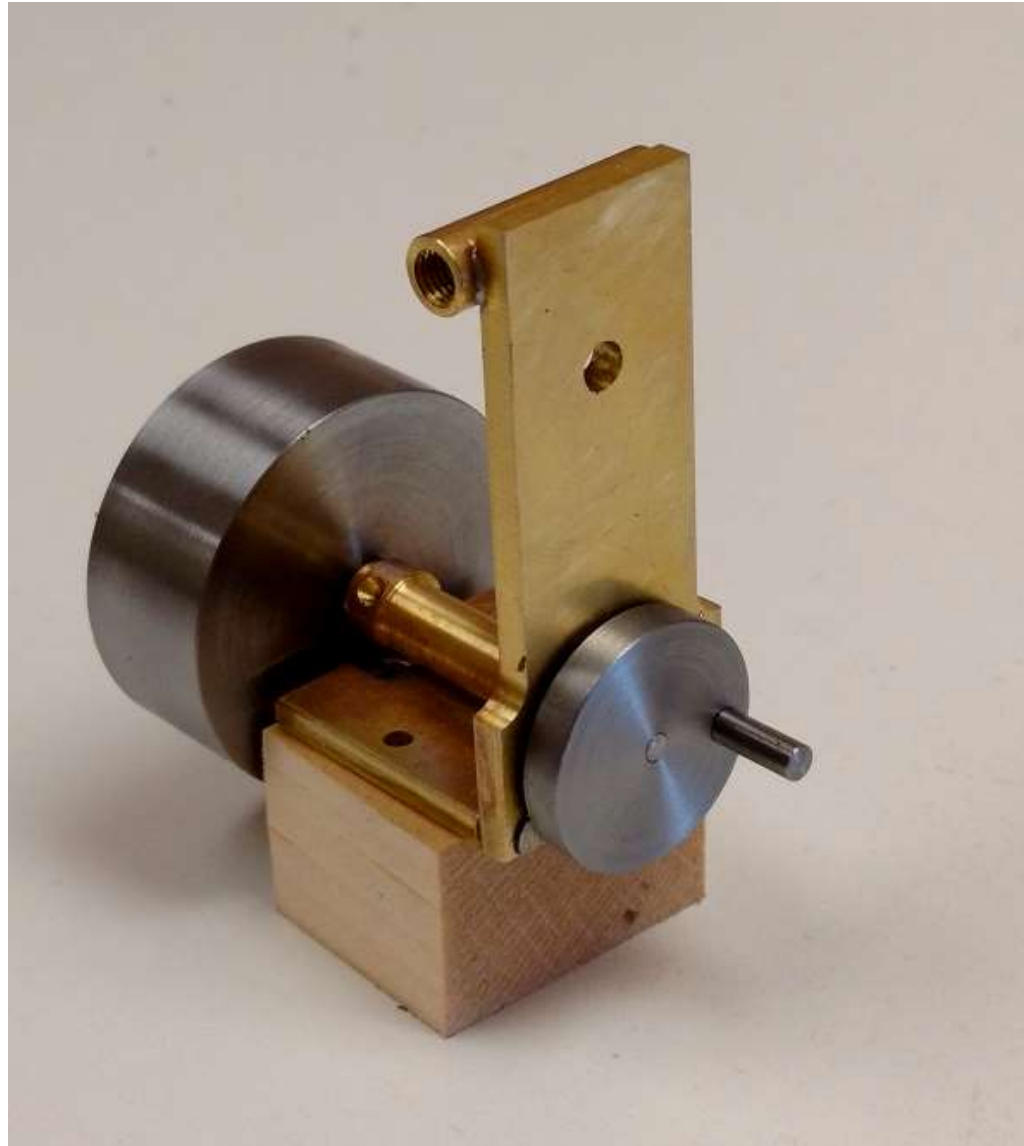
# Flywheel



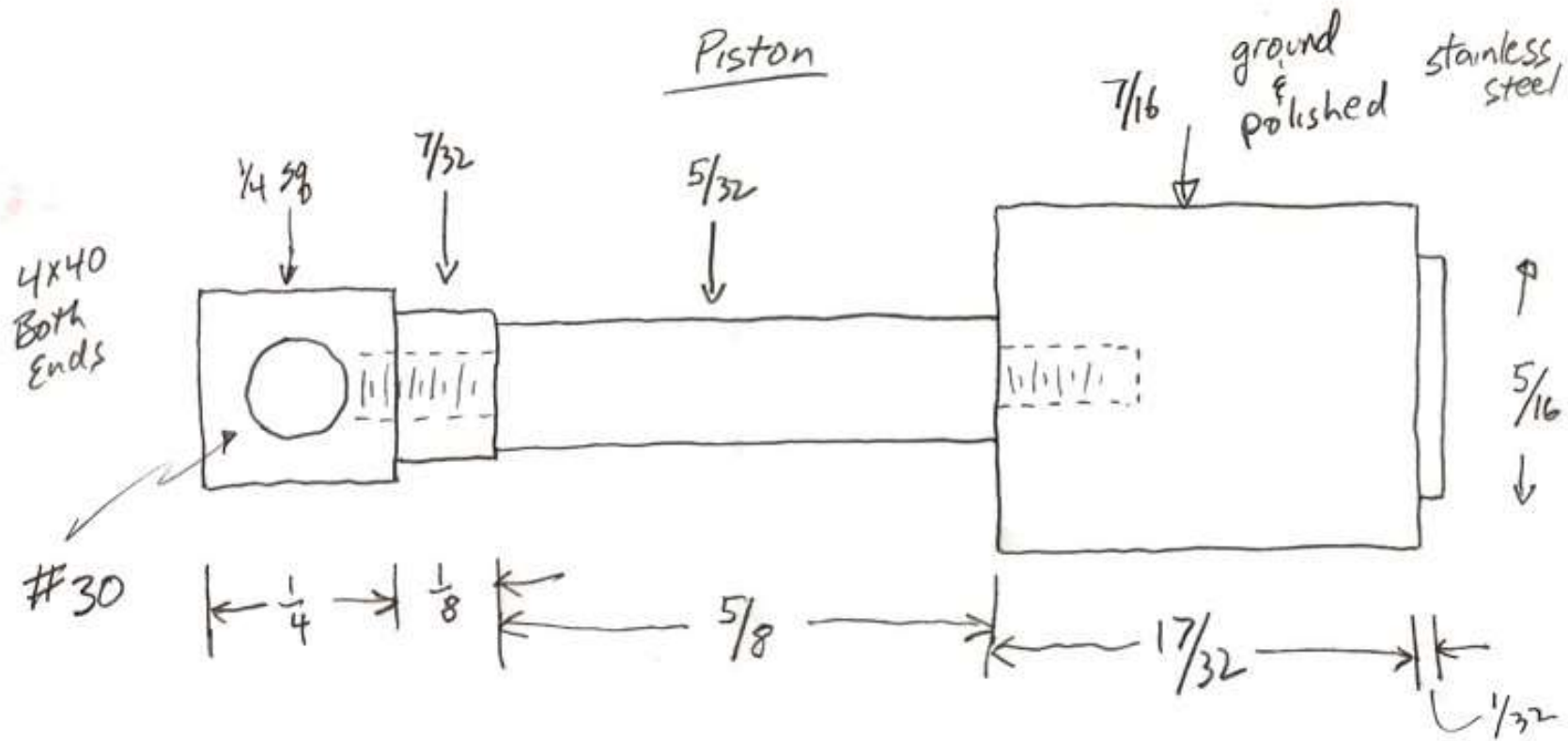
# Flywheel



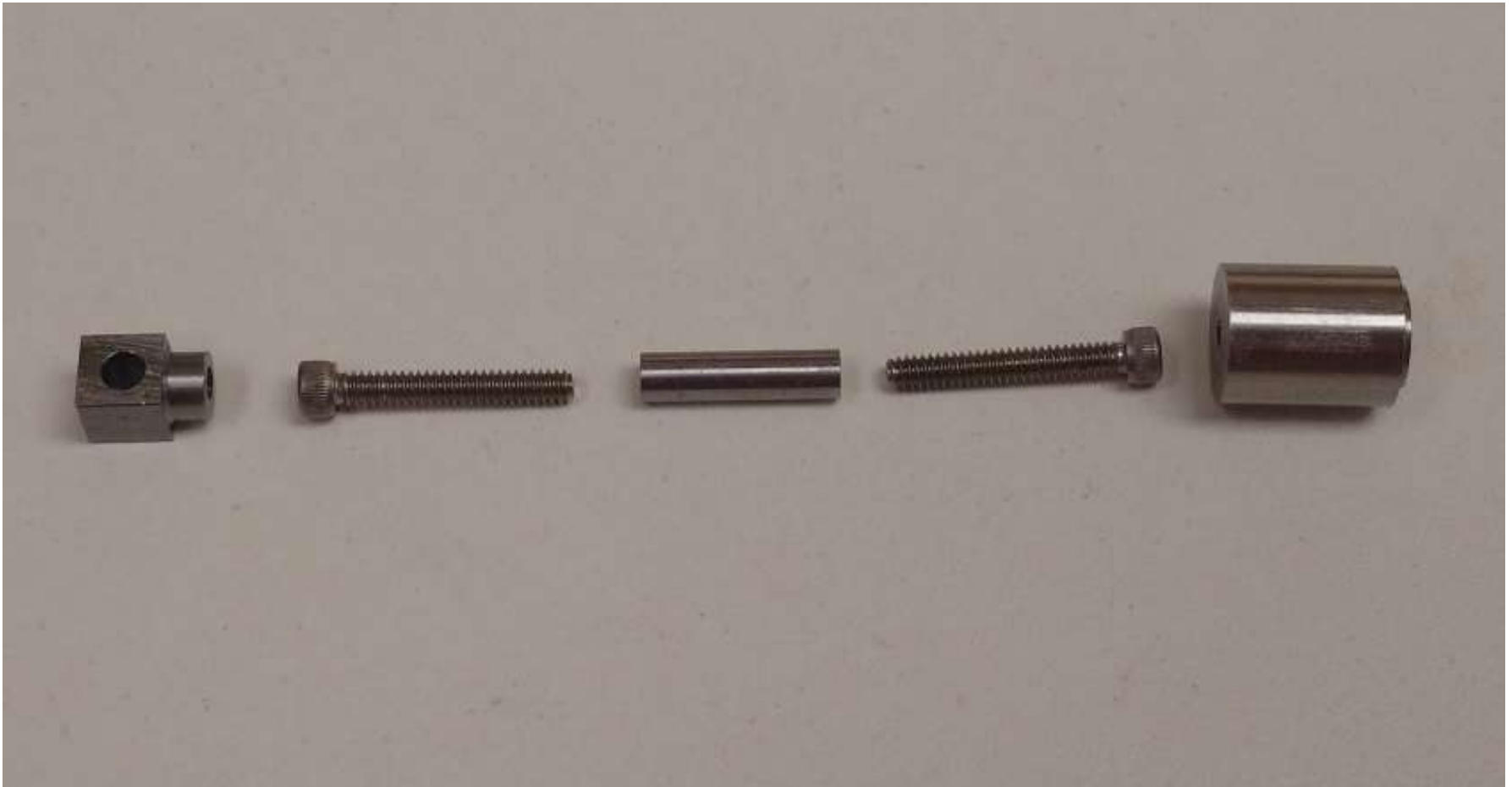
# Rotating Assembly



# Piston



# Piston



# Piston



# Piston



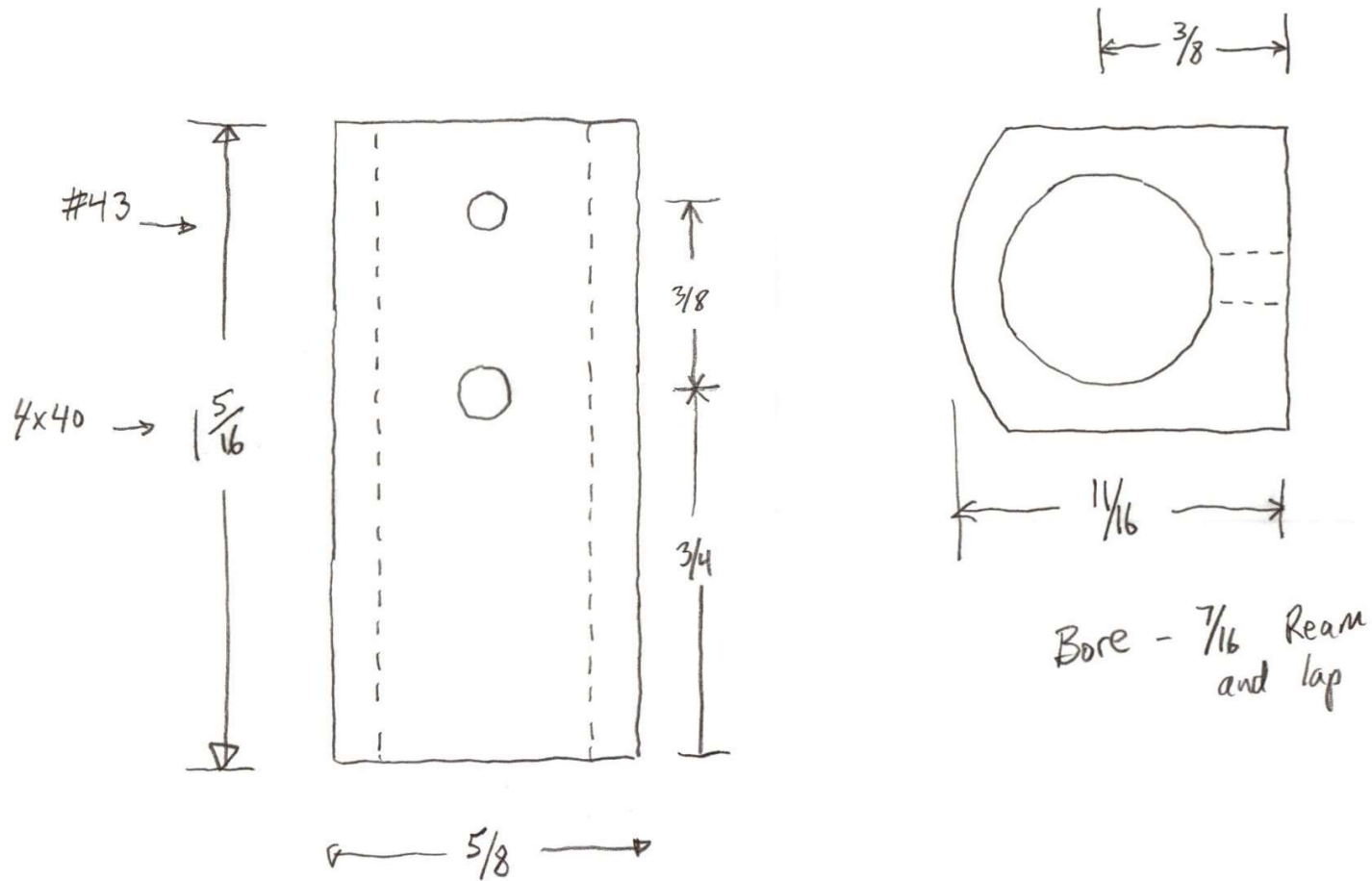


# Piston



# Cylinder

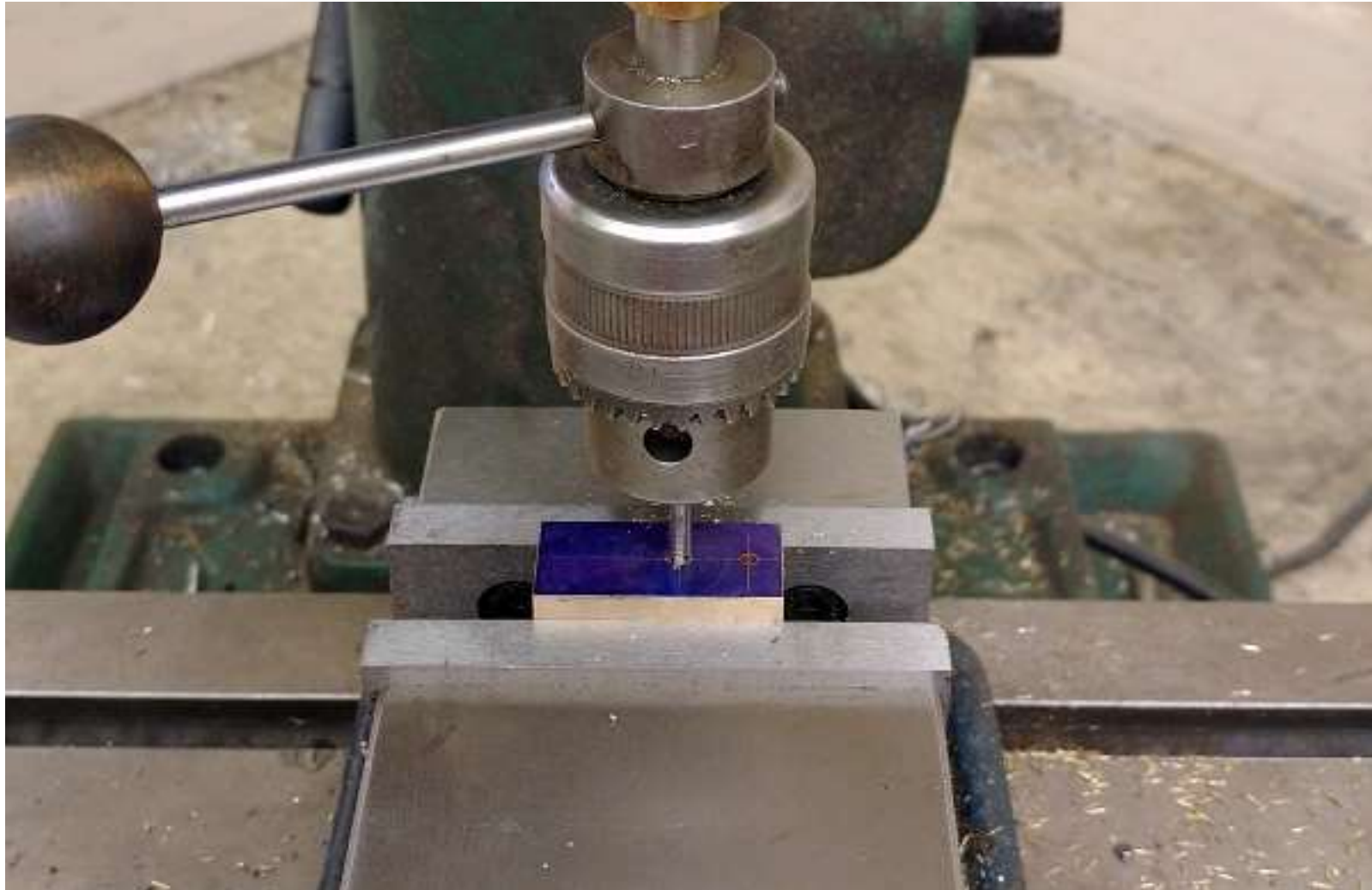
Cylinder Bronze



# Cylinder



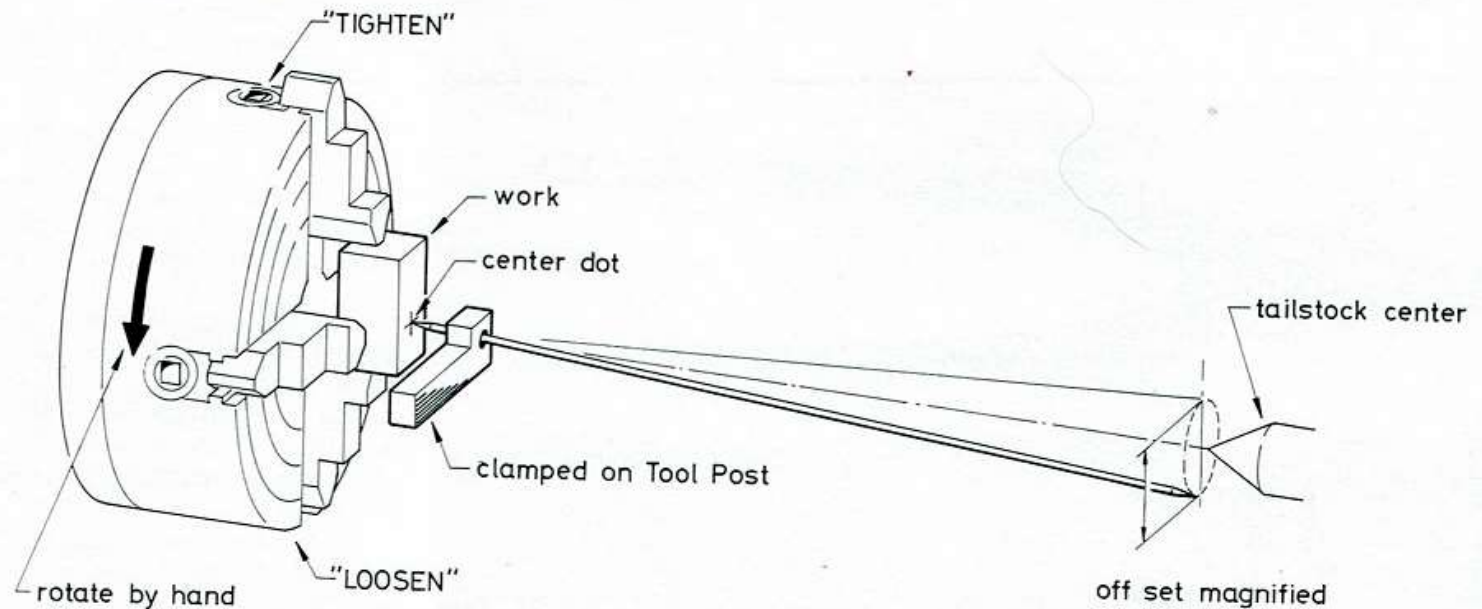
# Cylinder



# Cylinder

For accurate workpiece mounting, build a

## Center Test Indicator



Setting a work by means of Center Test Indicator

Homework Assignment: Kozo Center Test Indicator

Starrett Universal Test Indicator 64

# Cylinder



# Cylinder



# Cylinder





# Cylinder

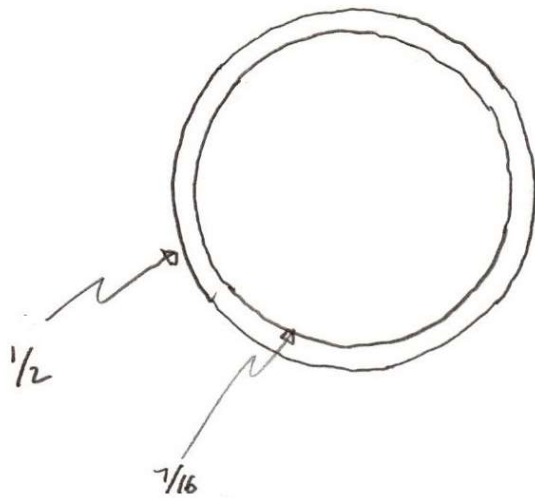


# Cylinder



# Cylinder

Top cover Brass



$\frac{1}{32}$



$\frac{1}{16}$

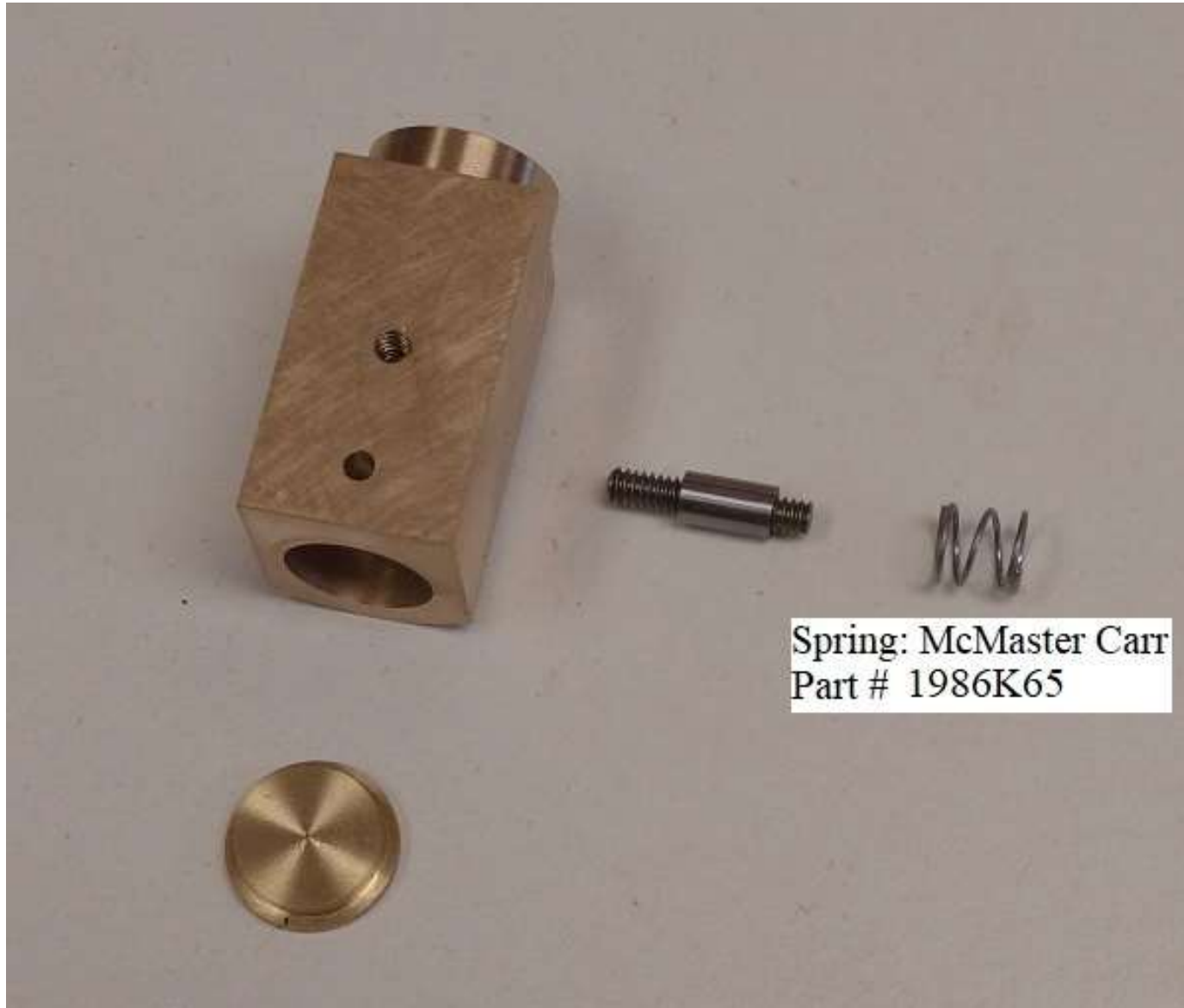
Pivot pin steel 4x40 Both ends

$\frac{5}{32}$



$\frac{1}{8}$   $\frac{1}{4}$   $\frac{3}{16}$

# Cylinder

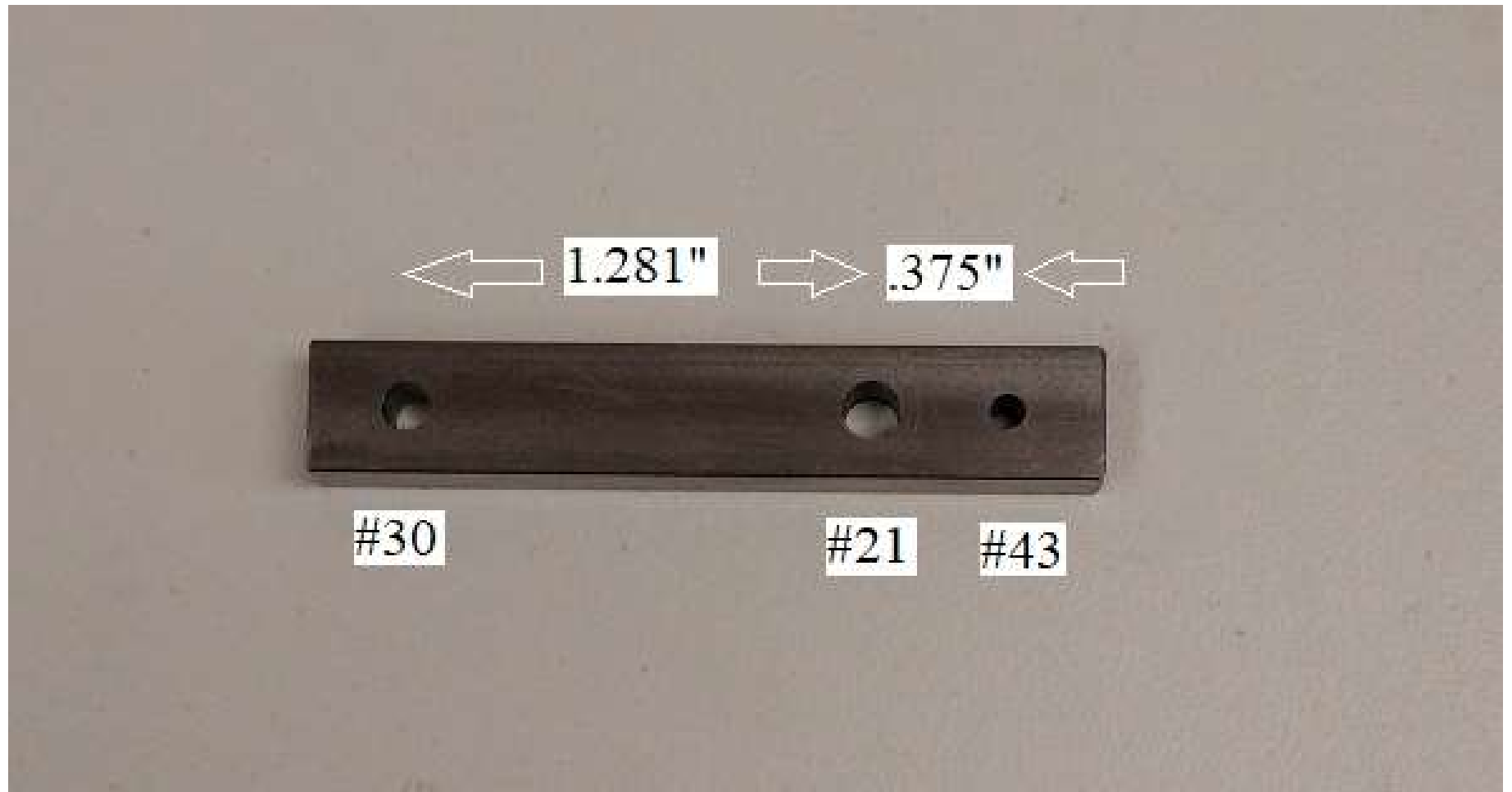


Spring: McMaster Carr  
Part # 1986K65

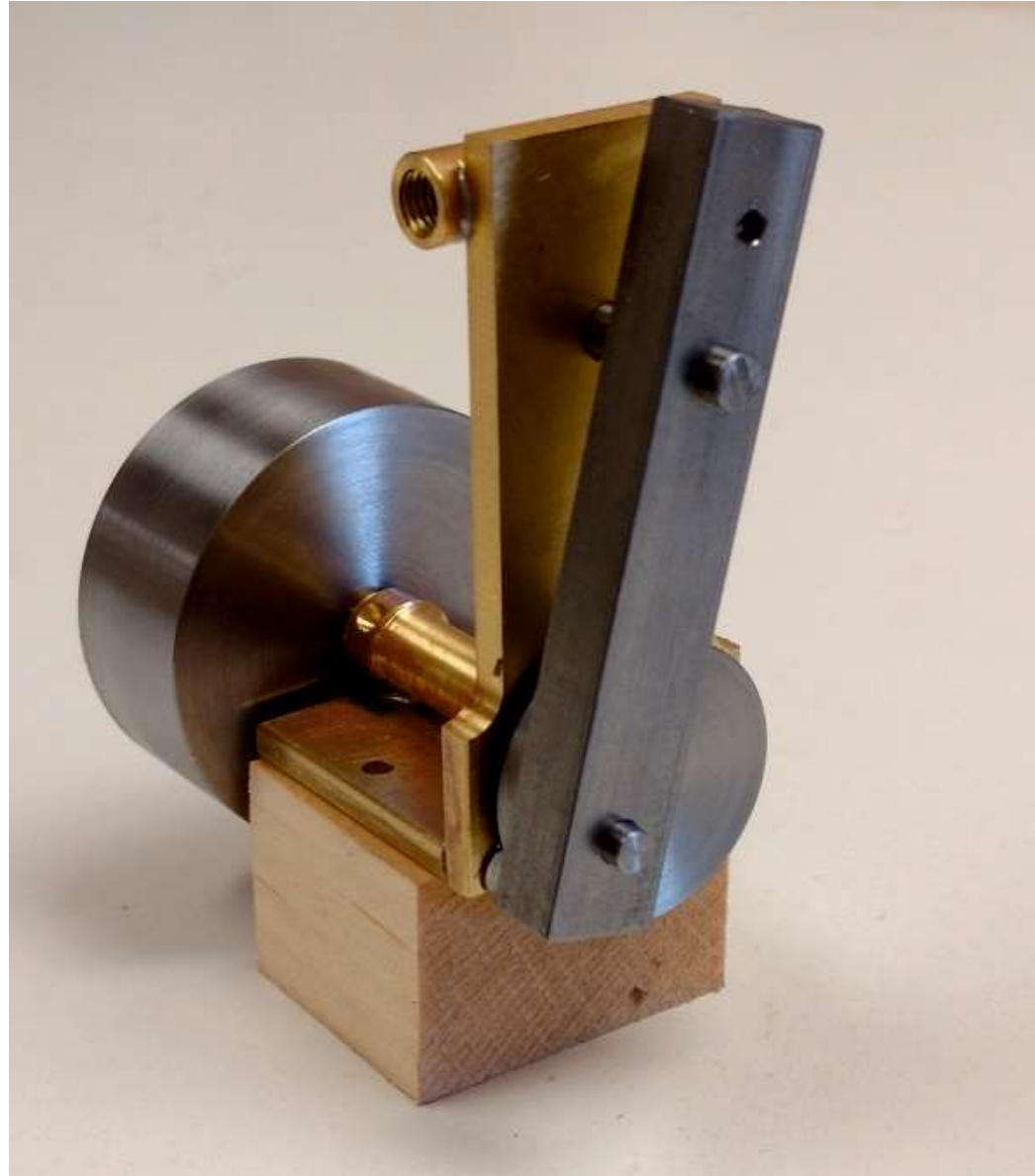
# Drilling the Portface



# Drilling the Portface



# Drilling the Portface

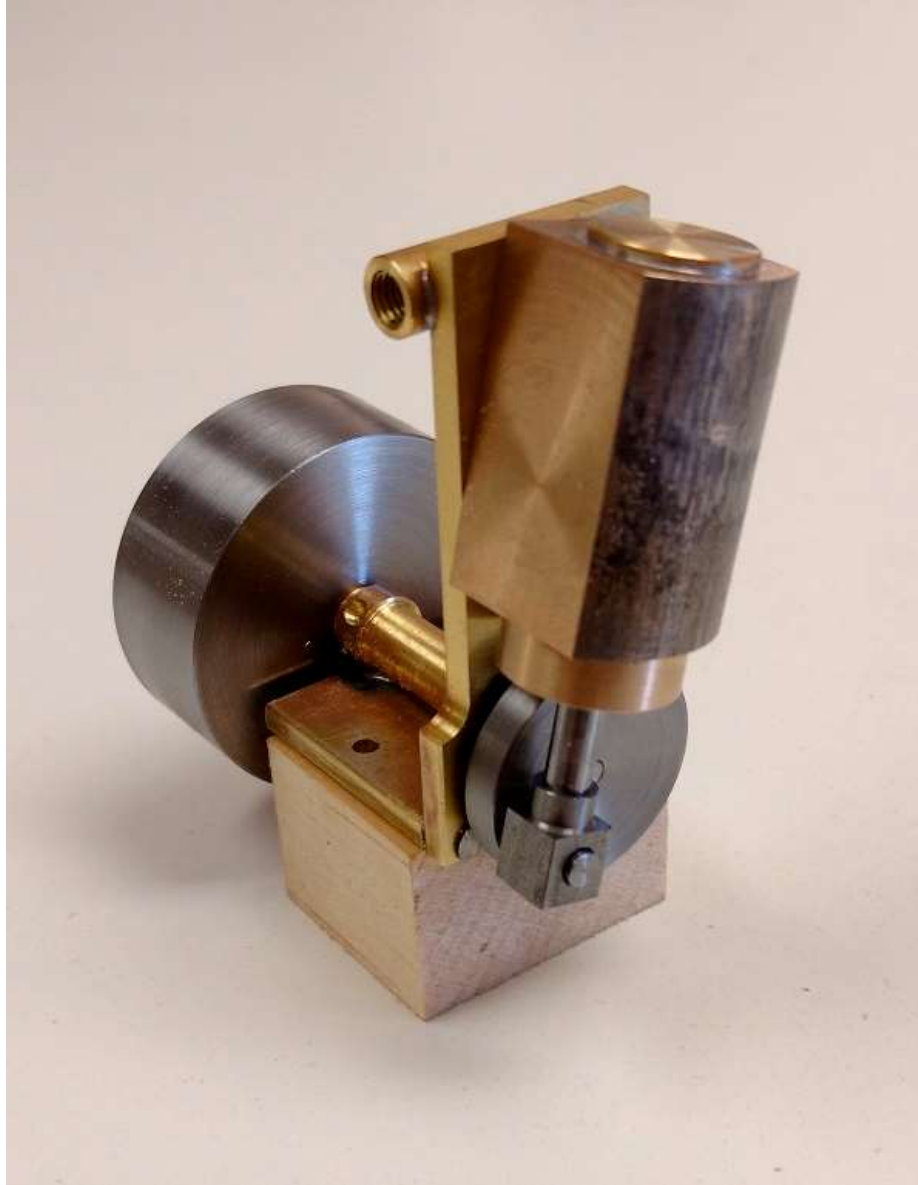


# Drilling the Portface





# Final Assembly



Questions??