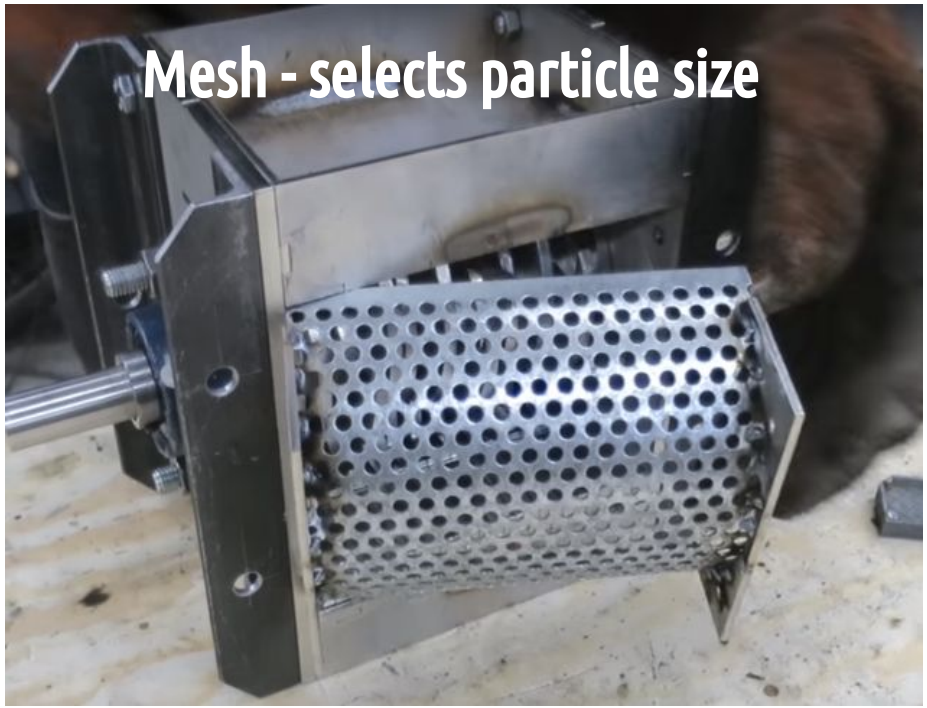
Plastic Shredder

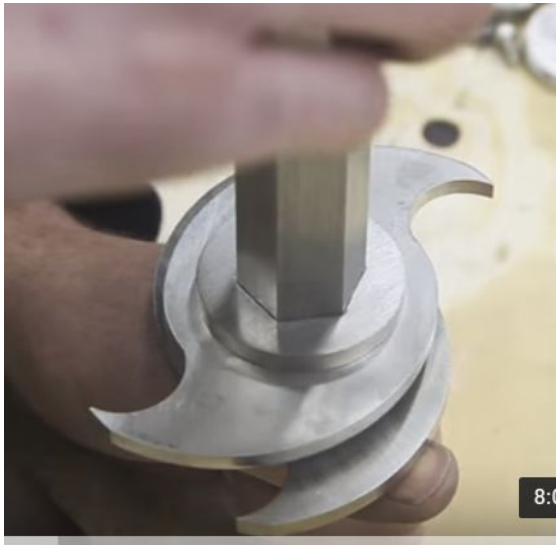
- Take the shredder from Precious Plastic



CNC Cut Parts and Hex Shaft

- Hex shaft is good
- Can do DIY by welding
  - Value add - use stock sections of steel?

Blade-Spacer Combination



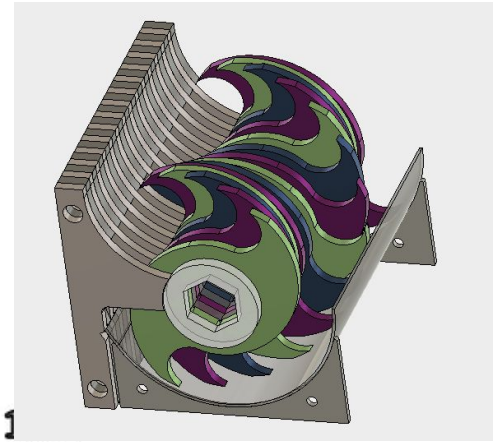
Staggered by 60 Degrees

Breaker is Vertical Slots with Spacers

- Cutter appears 7” wide

Blade-Spacer Combination

Blades are Slightly Narrower than Spacer - 5 mm vs 6 mm

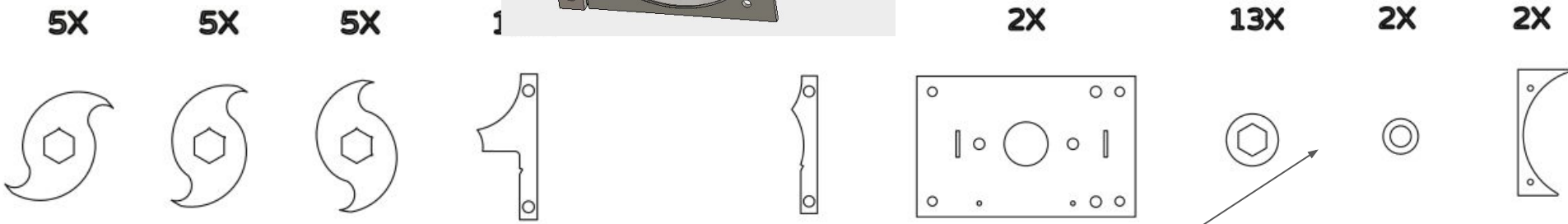


Narrow Blade and Breaker

5MM

Wide Spacers (for blade and breaker)

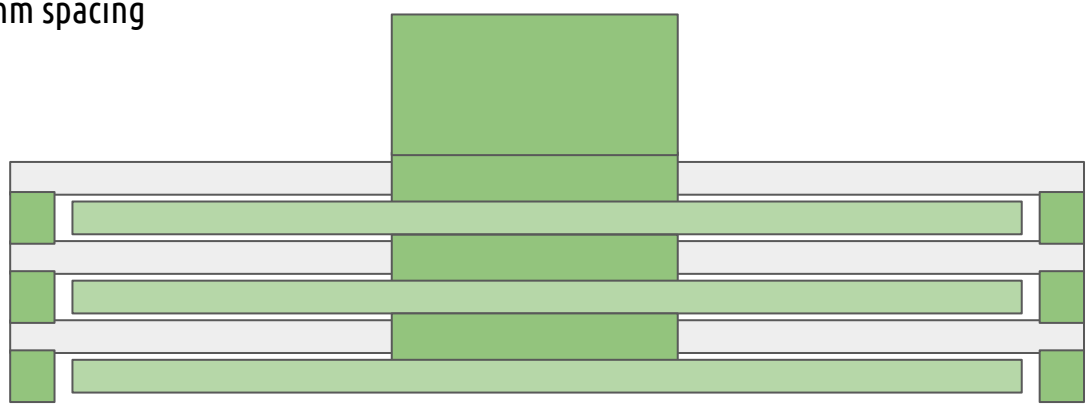
6MM



Locates Shaft in Hole of Box

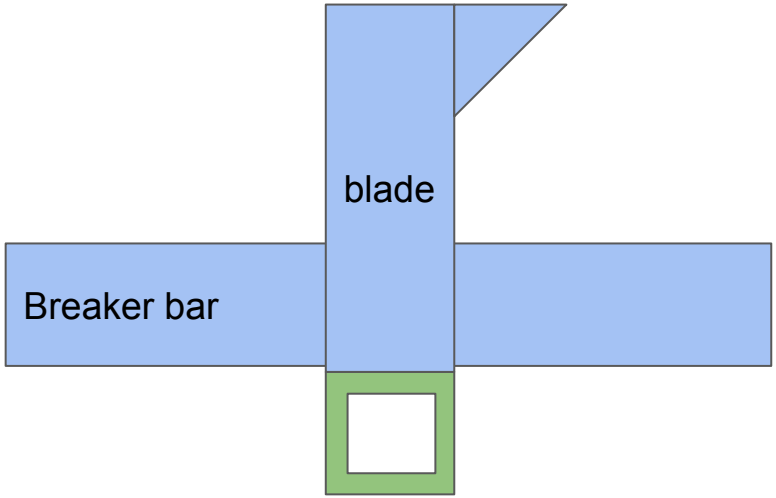
With Welding, It is Easy

- 5 vs 6 mm is only 1 mm spacing
- ⅜” and ½” is 3 mm spacing
- Pattern:



Simple Design

- Side view:
  - 2” Square tube to locate a shaft



Simple Design

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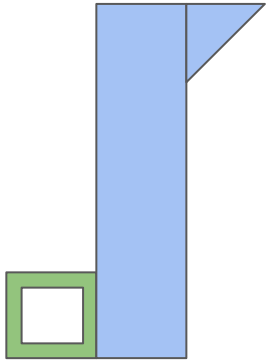
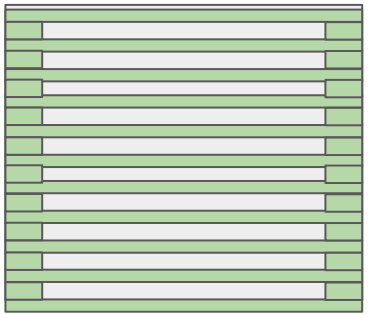


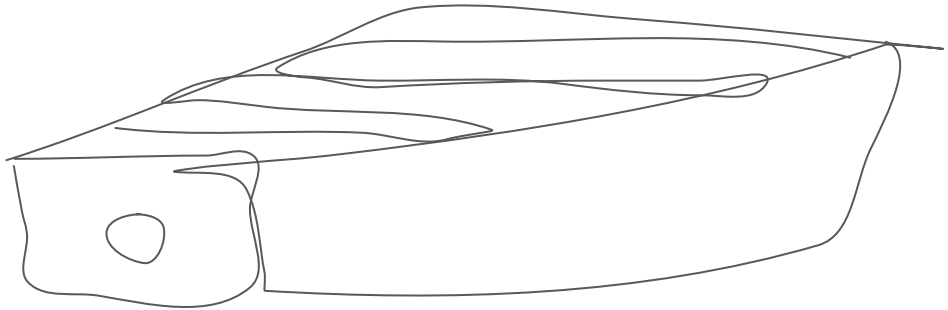
Design For Fabrication

- Start with even frame, 2” high

- Weld in slats

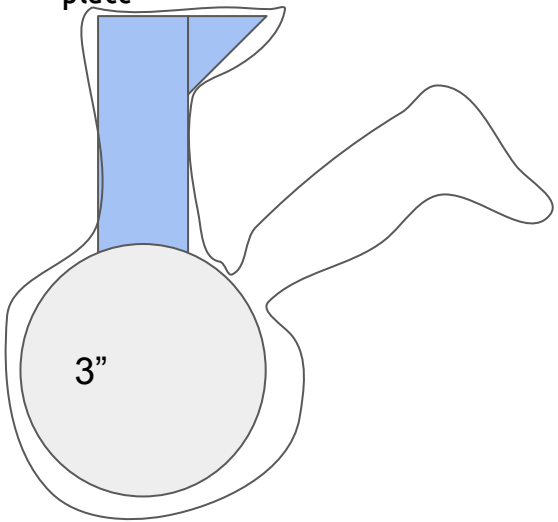


- 3D print spacers for blades

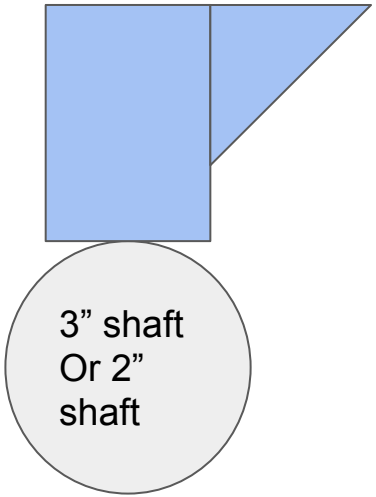


Round Design - build in Place vs not

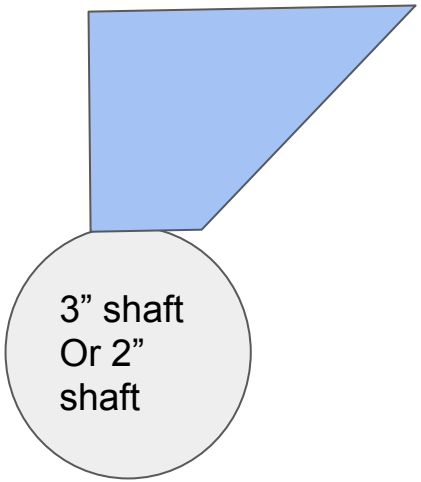
- Side view:
  - 4” round tube for attaching tines
  - 3D printed form for placing tines in place



- 3” pipe
  - 3” tines



- 3” pipe
  - 45 deg 1-piece tines

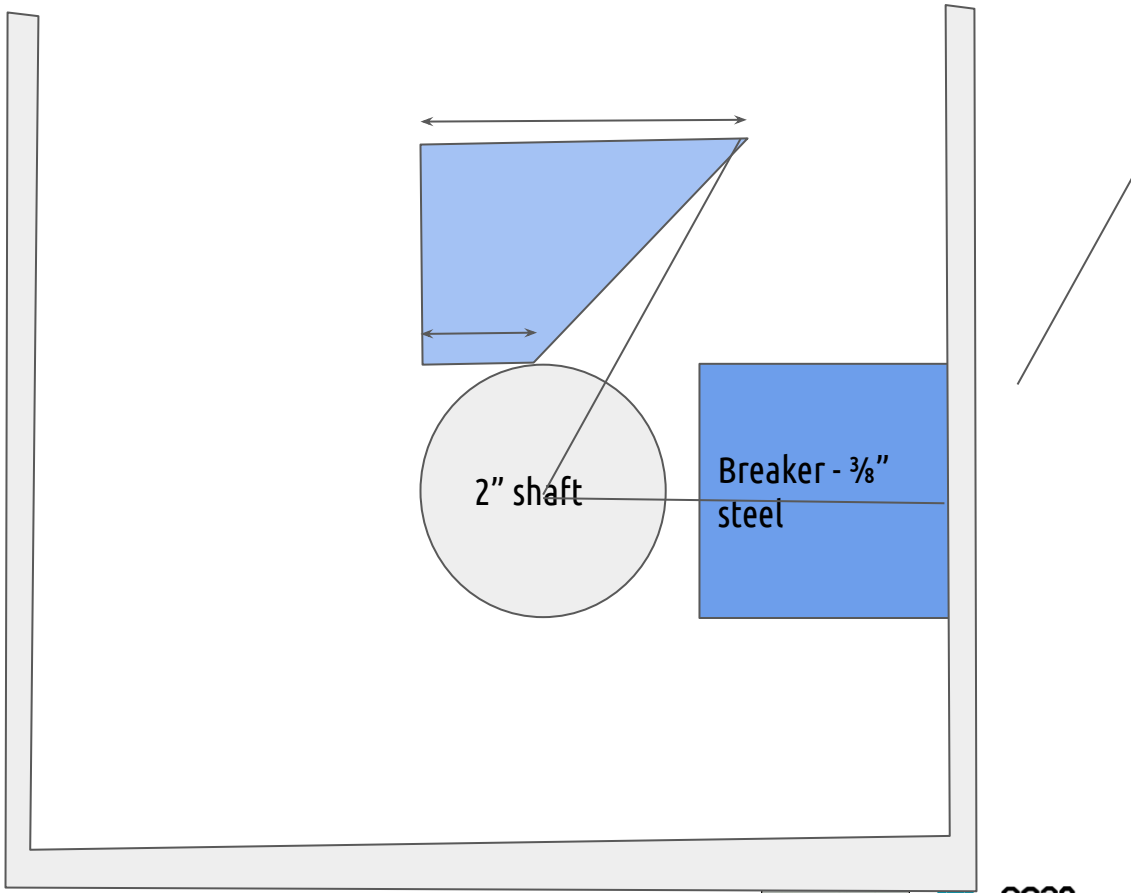


Simplicity

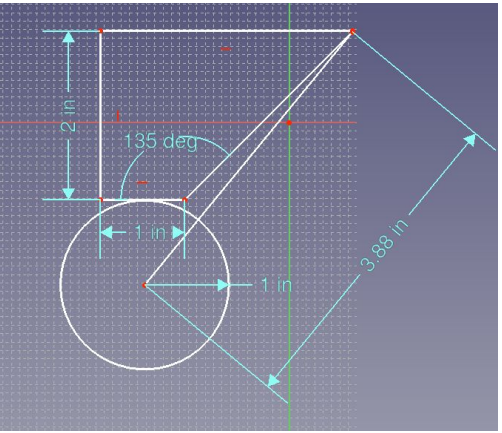
- Use Lyman or Recyclebot geared down motors for simplicity
- This allows simplicity of alignment - if we use single tine - tine passes through only once per breaker
    - 45 deg 1-piece tines, ¼” steel
- Start with modular design for torque testing

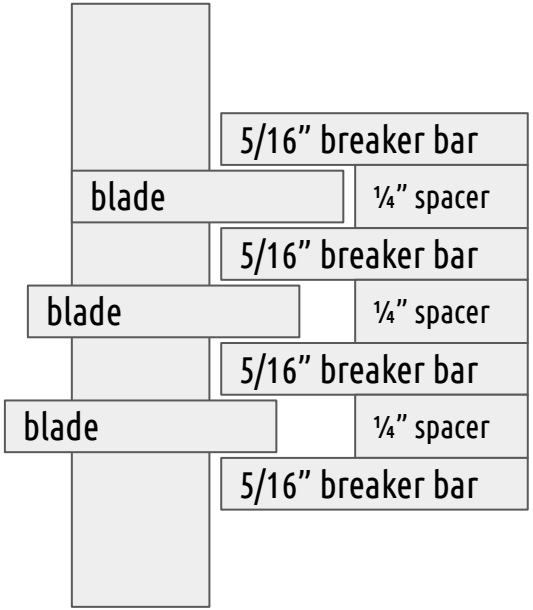
5/16” breaker bar

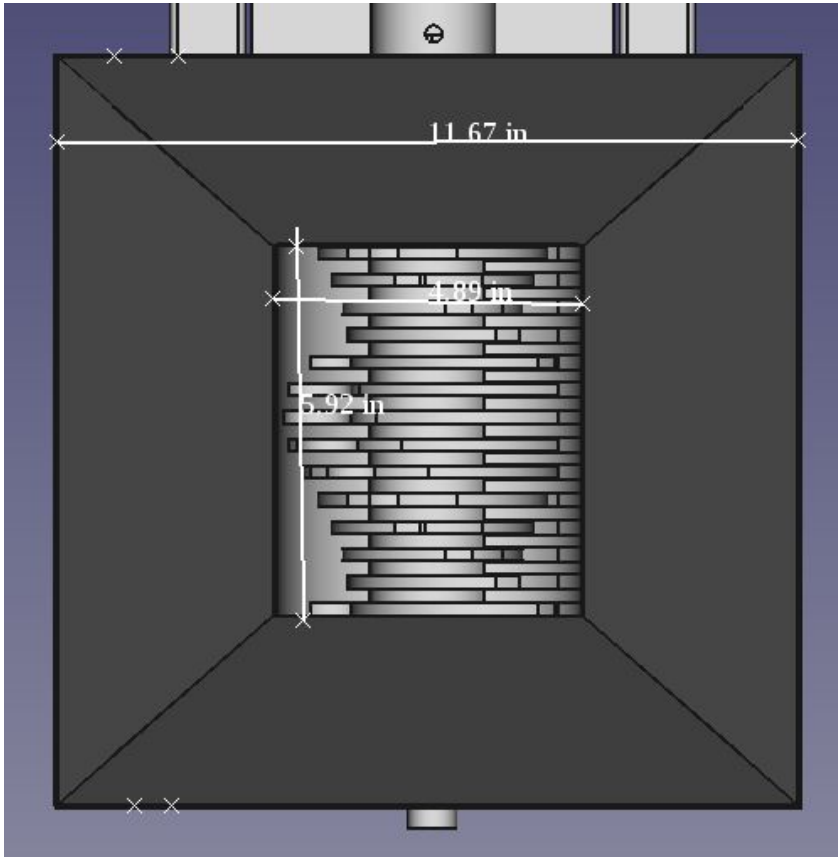
¼” spacer



Test Driven Design

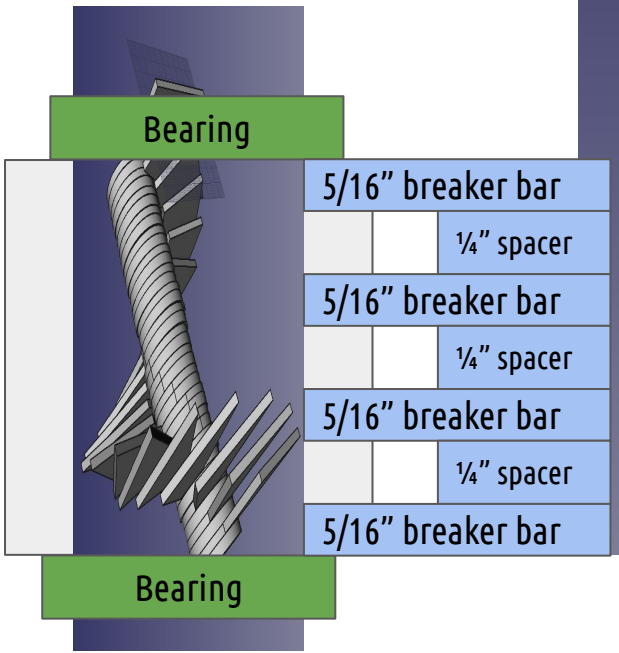


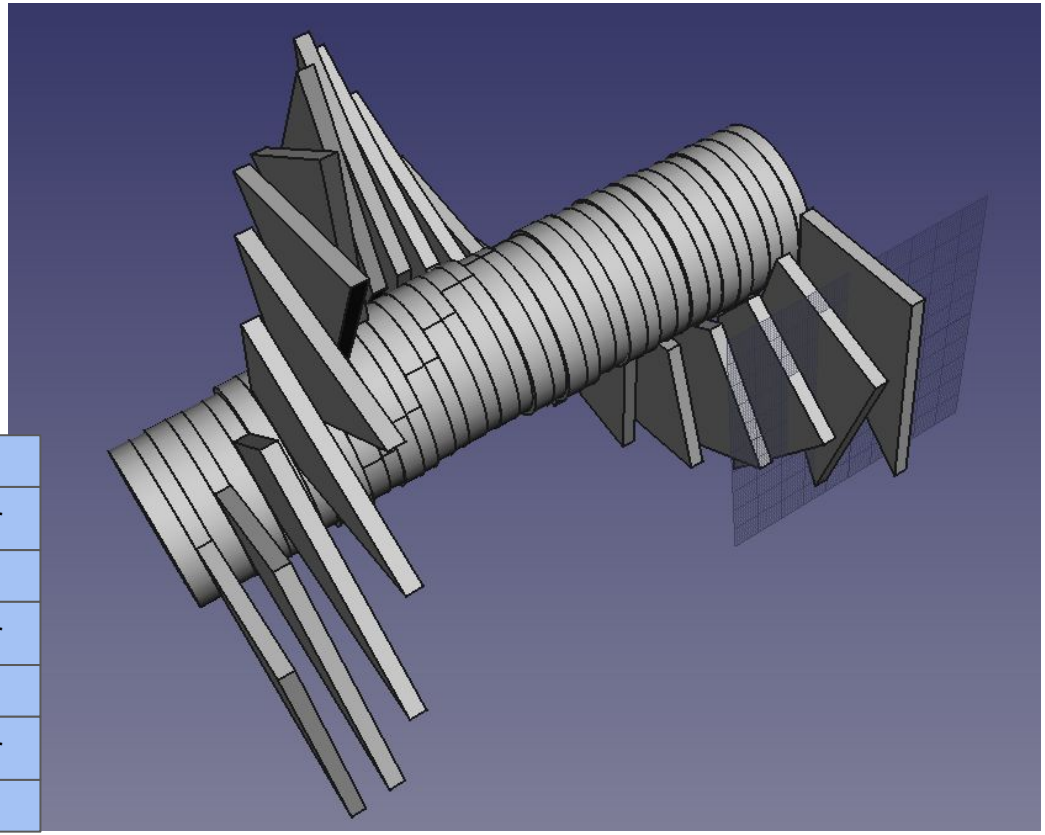




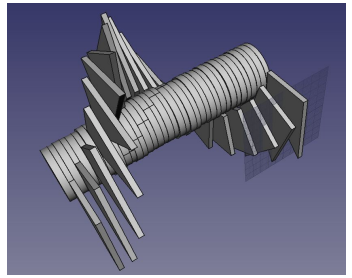
Basic Unit

- Take simple one-tooth units and build from there
- Additional teeth may be retrofitted based on power available
- CAD file
- Concept: 1260 bites per minute, 76k bites per hour (18 teeth per revolution, 70 rpm)

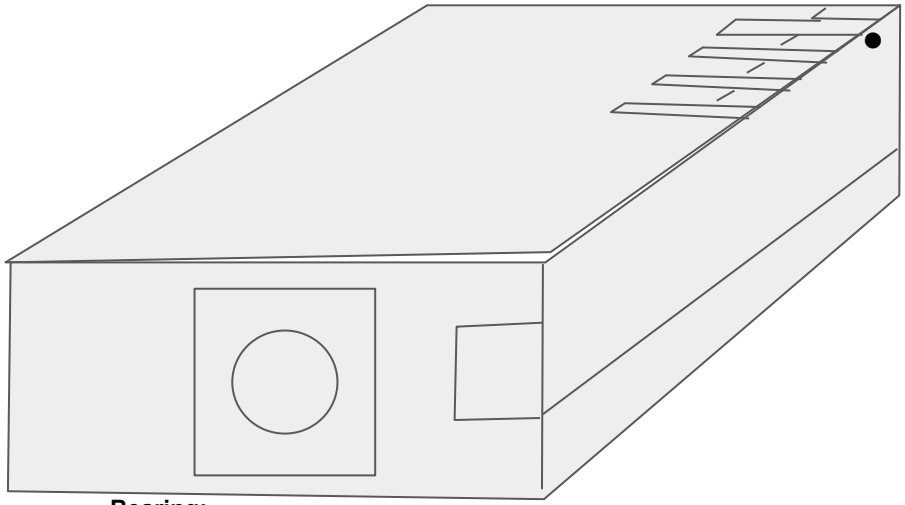




Build Feasibility



- 8” wide, 9” long



8” wide, 9” long

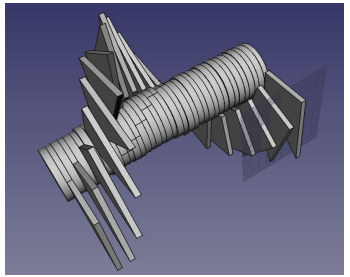
2” tall

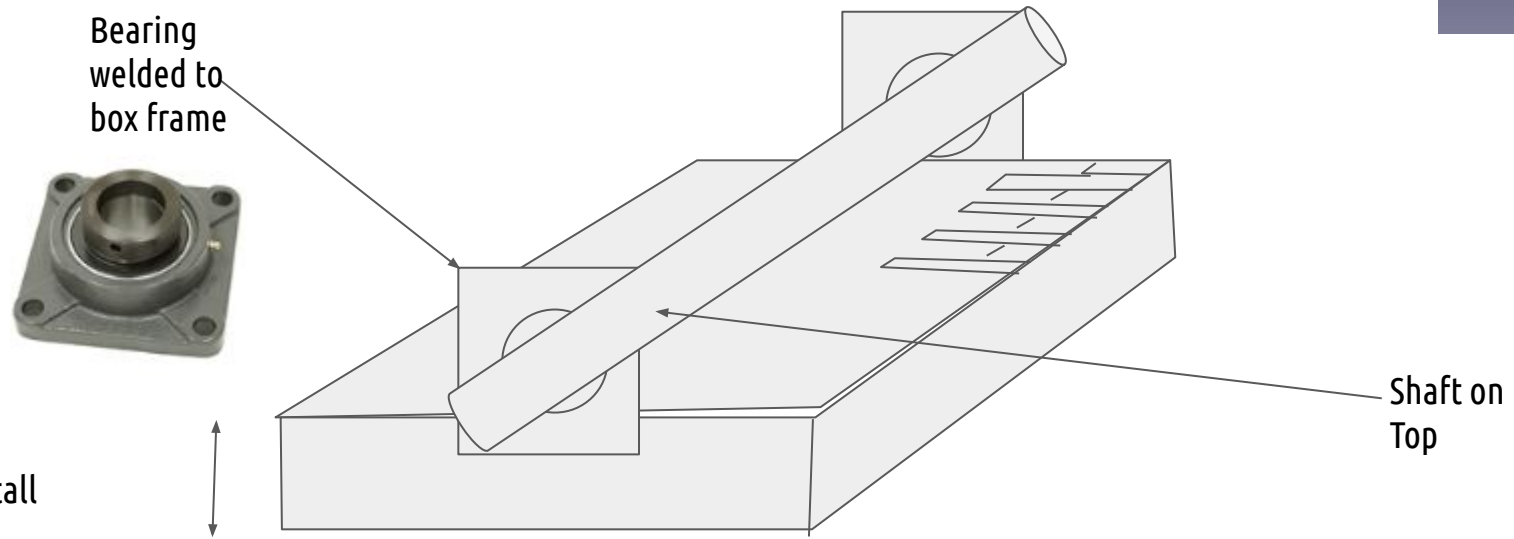
Bearing:

- **Mount** 4.370"
- **Bolt Size** 9/16"
- **Overall Length** 5.630"

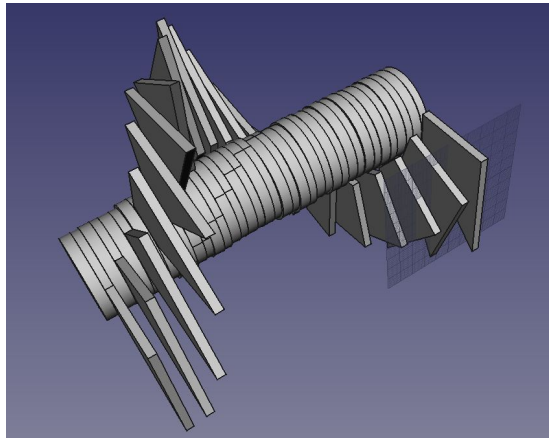
Build Feasibility 2

- Weld in tines, 3/16” x 2” bar cuts
- Weld in breaker bars - 3” long + 1” spacers

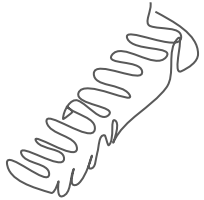


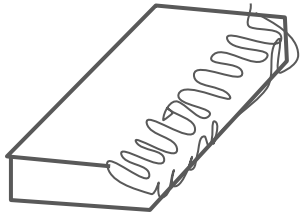


Build Procedure

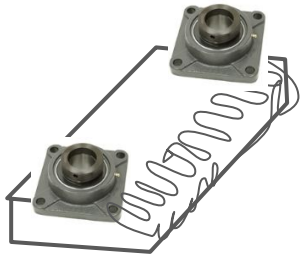


1. Build breaker bar
   a. [18] ¼”x2” flat, 1” long
   b. [18] 3/16”x2” flat, 3” long

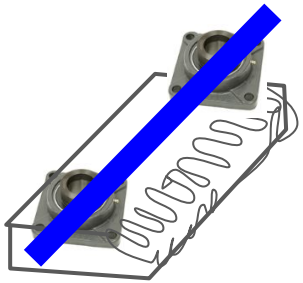




2. Build shallow (2” deep) Box around breaker bar



3. Add bearings



Shaft on Top

4. Add shaft
5. Weld on tines
6. Put a handle on shaft, test it
7. When it works, extend sides up to get a box shape: