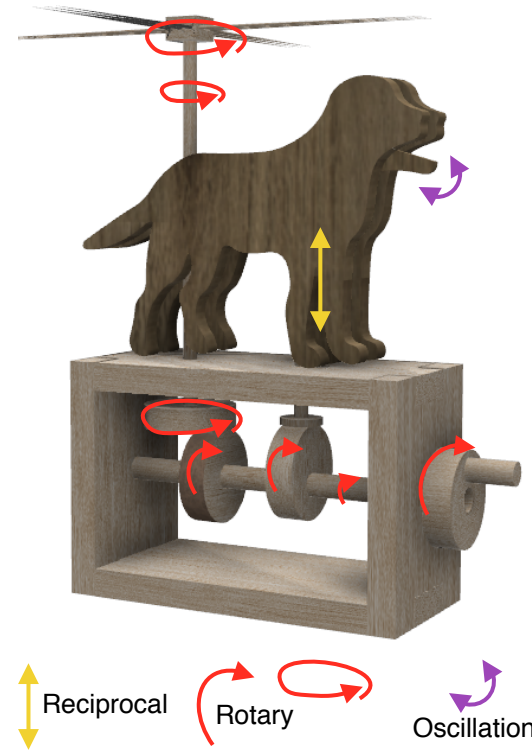
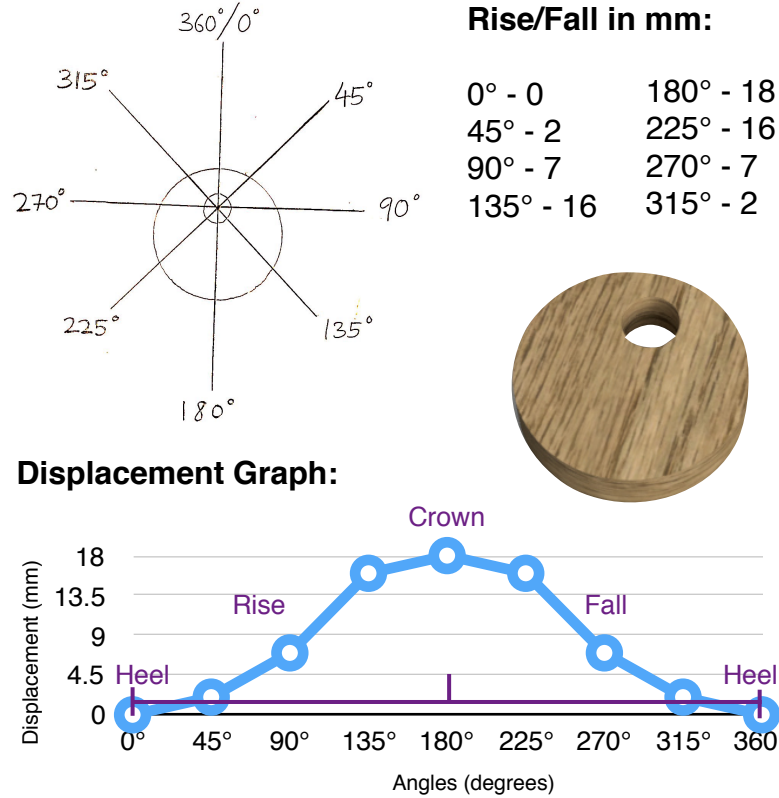


Automaton Project:

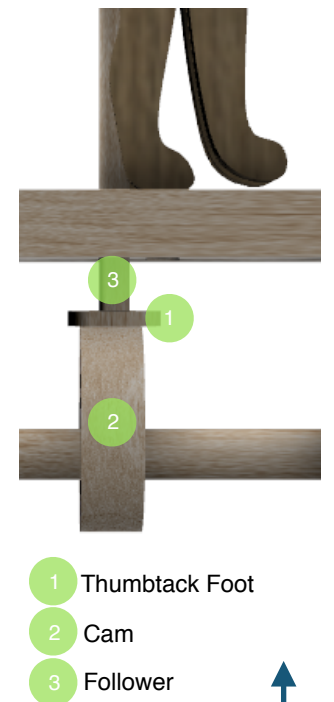
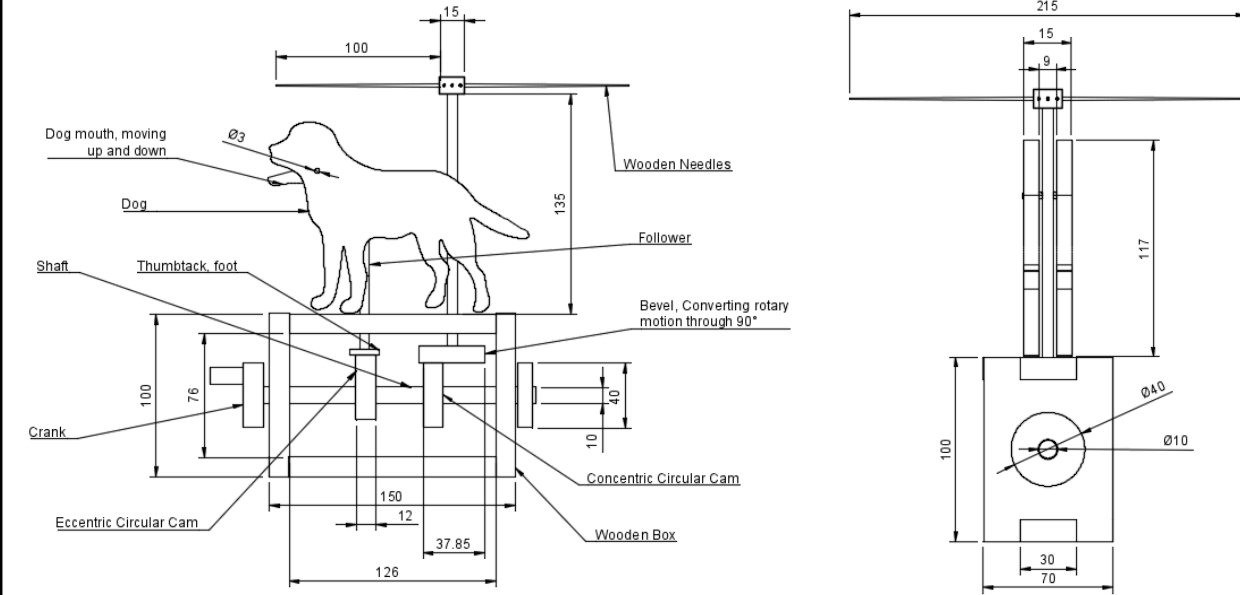
Motions Identified:



Displacement Graph for Cam and Follower Eccentric Circular Cam



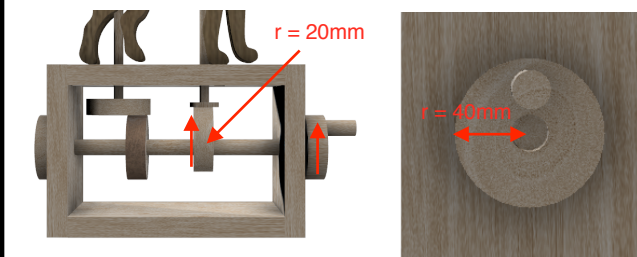
Working Drawing



Velocity Ratio - Crank : Eccentric Cam

$$VR = \frac{\text{Distance moved by Effort (Crank)}}{\text{Distance moved by Load (Cam)}} : 1$$

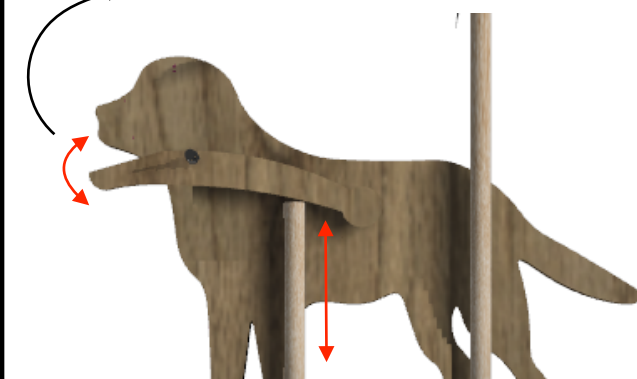
$$VR = \frac{2\pi r}{2\pi R} = \frac{2\pi(40/2)}{2\pi(20)} = 1:1$$



Velocity Ratio - Cam : Dog Mouth

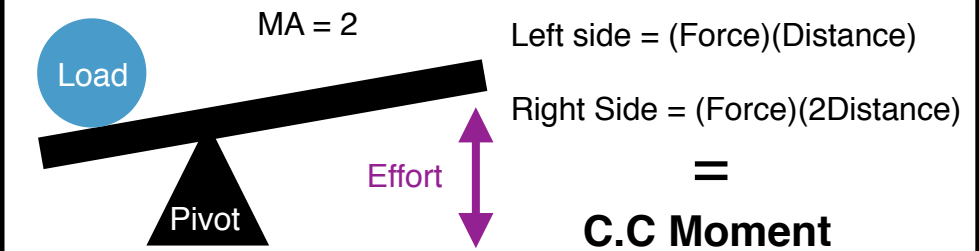
$$VR = \frac{\text{Distance moved by Effort (Cam)}}{\text{Distance moved by Load (Dog M.)}} : 1$$

$$VR = \frac{18\text{mm}}{30\text{mm}} = 0.6:1$$



Mechanisms and Specific Components Identified

Dog mouth moving mechanism = **1st Class Lever**

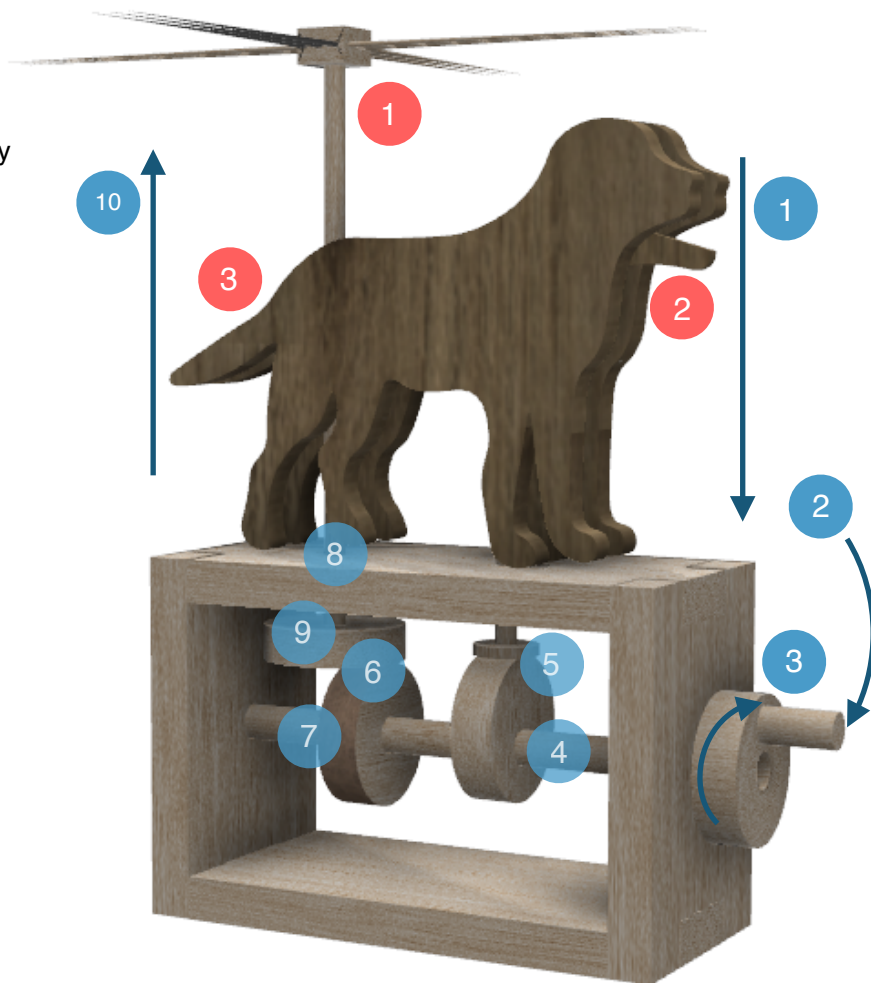


Bevel Mechanism

- Converts **rotary** motion through **90°**
- Sandpaper to **↑ friction**
- 2 circular **concentric** cams

Forces and Loads Identified:

- 1 Gravitational Force
- 2 Applied Force (Crank)
Muscle - Mechanical Energy
- 3 Torque/Moment
- 4 Shear Force
- 5 Shear + Compression
- 6 Shear Force
- 7 Shear Force
- 8 Shear Force
- 9 Shear Force
- 10 Normal Force
- 1 Dynamic Load
- 2 Dynamic Load
- 3 Static Load



Housing components and Joints:

