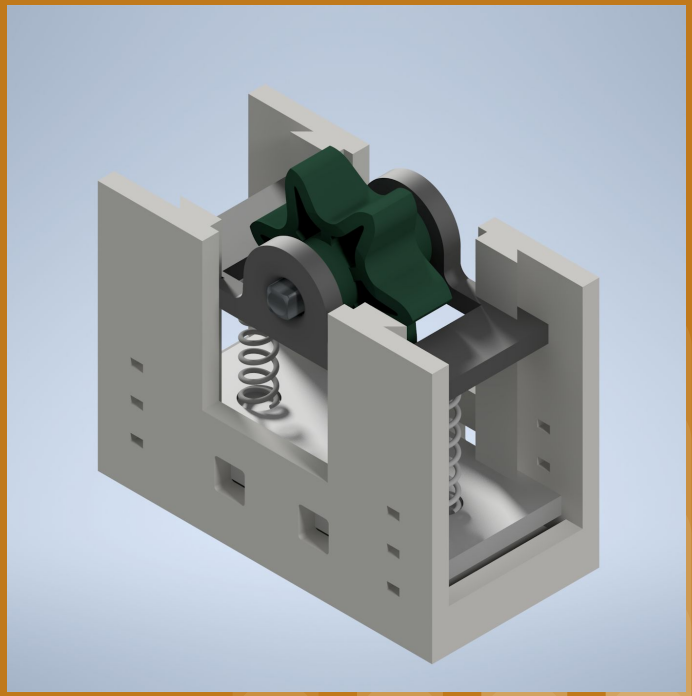
VEX Adjustable Spring-loaded Chain Tensioner

By Team 39k

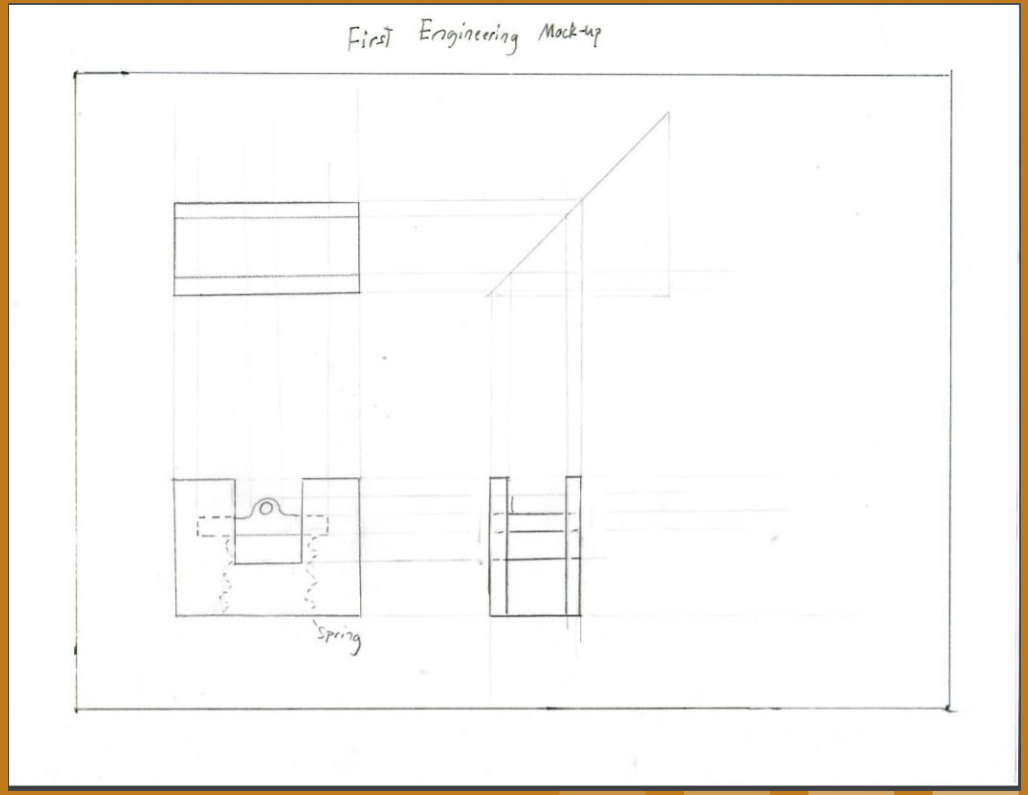
Purpose and Usage

The purpose and goal of our project is to make chain usage on the drivetrain or other subsystems as efficient as possible. To accomplish this, our project uses springs, which both tightens the chain to take out the slack and allows some give in order to have minimum friction. Both these factors can be changed by a adjustable bottom plate in order to have the most efficient system possible.



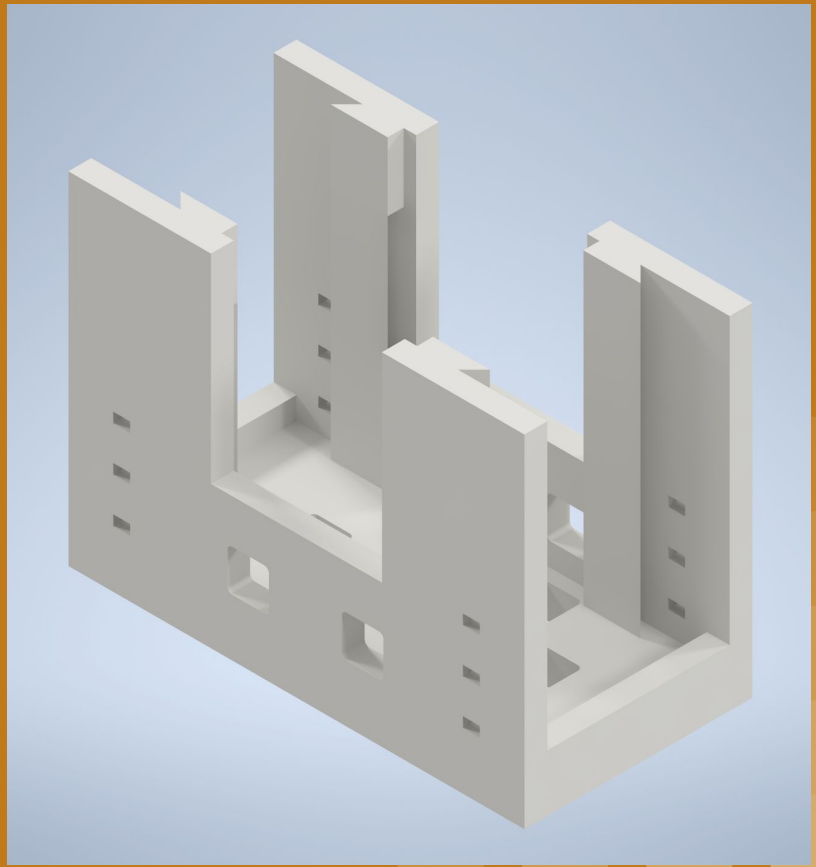
Designing the Part

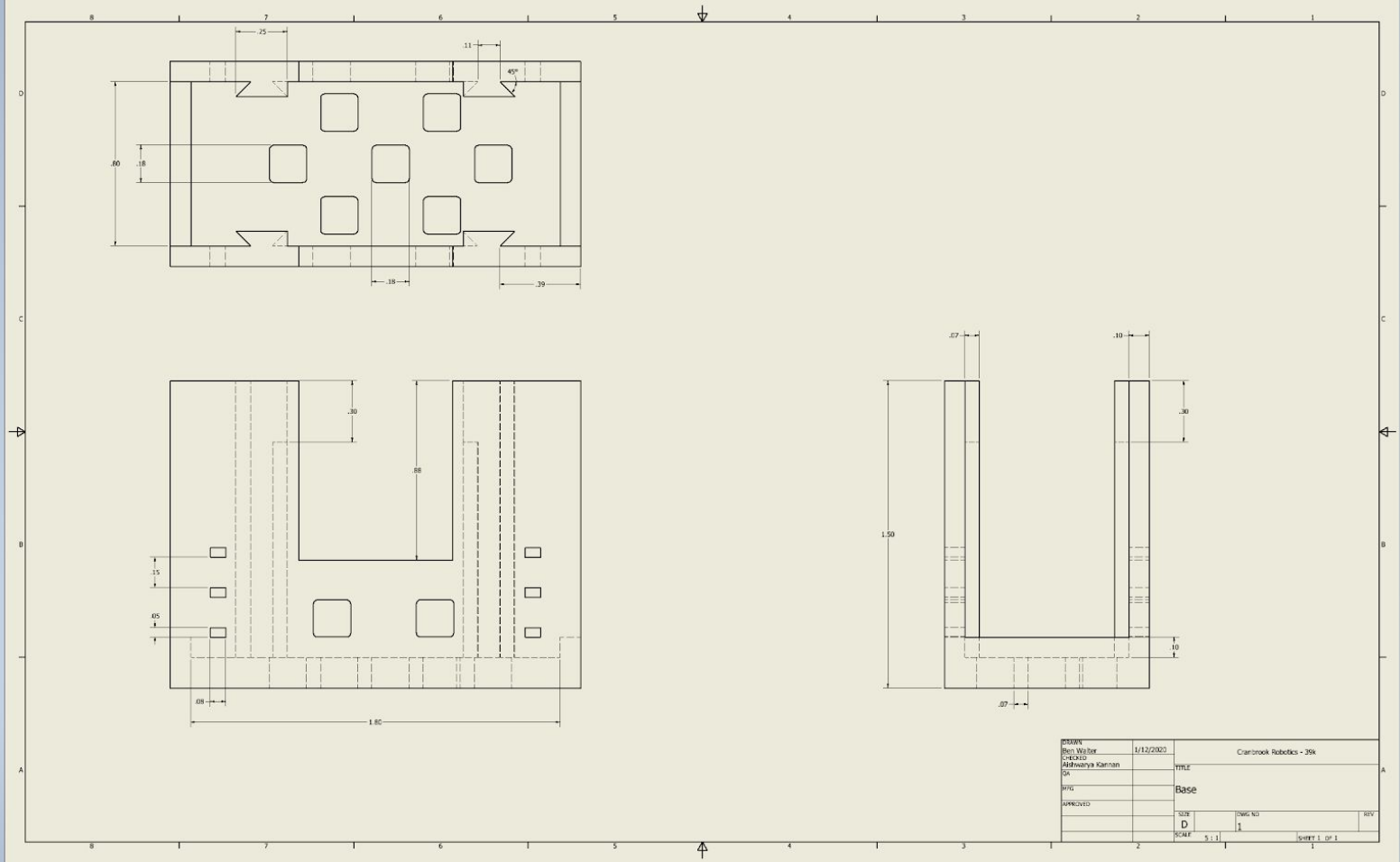
First, we made an isometric drawing by hand in order to make the actual CAD part of the project easier.



Base

The base is the foundation of our mechanism. The large holes on the sides and bottom are for mounting, and are the same size as the holes on C-Channel. The sets of 3 holes on the sides are for the bar which holds the bottom plate. Finally, the trapezoids sticking out on the inside are a slide for both the top and bottom plate to move.




.25
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45°
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1.80
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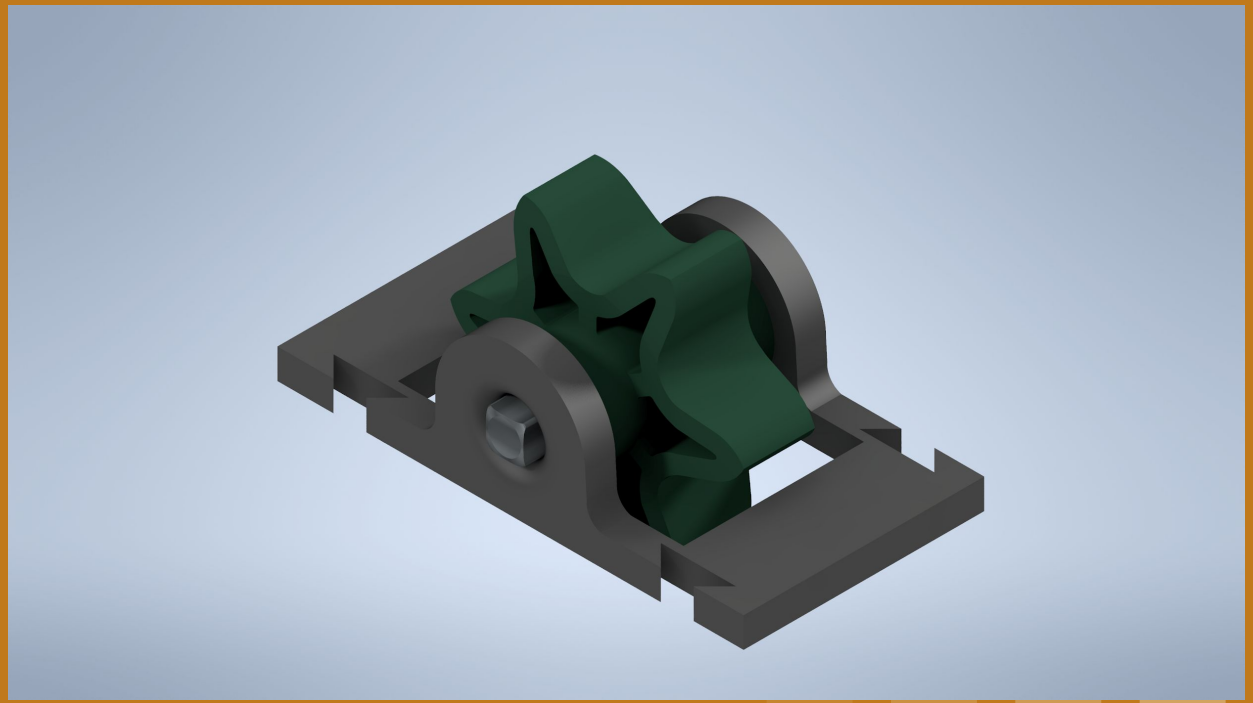
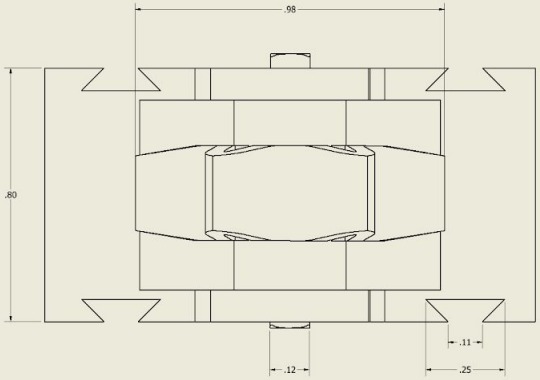
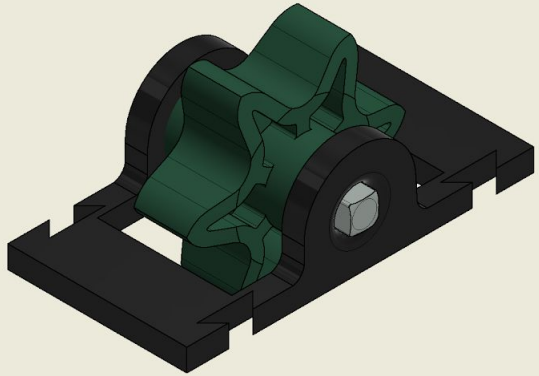
.10
.30
1.50
.10
.07
DRAWN
Ben Walter
1/12/2020
CHECKED
Aishwarya Kannan
QA
MFG
APPROVED
Cranbrook Robotics - 39k
TITLE
Base
SIZE
D
DWG NO
1
REV
SCALE
1 : 1
SHEET 1 OF 1

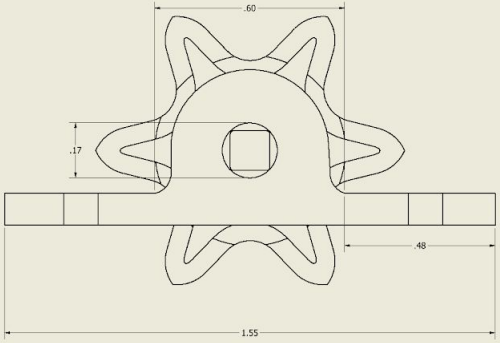
Top Plate

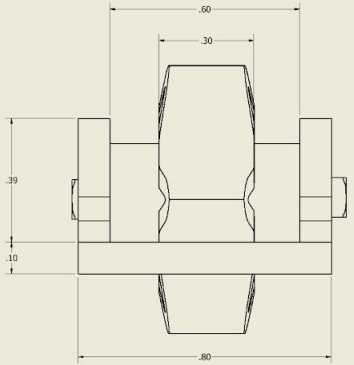
This is the top Plate of the design, which is the one part that touches the chain. The inner hole while the axle is resting on is filleted, allowing for minimum friction between it and the axle. It also has the slide cutouts to move up and down the slides on the base.







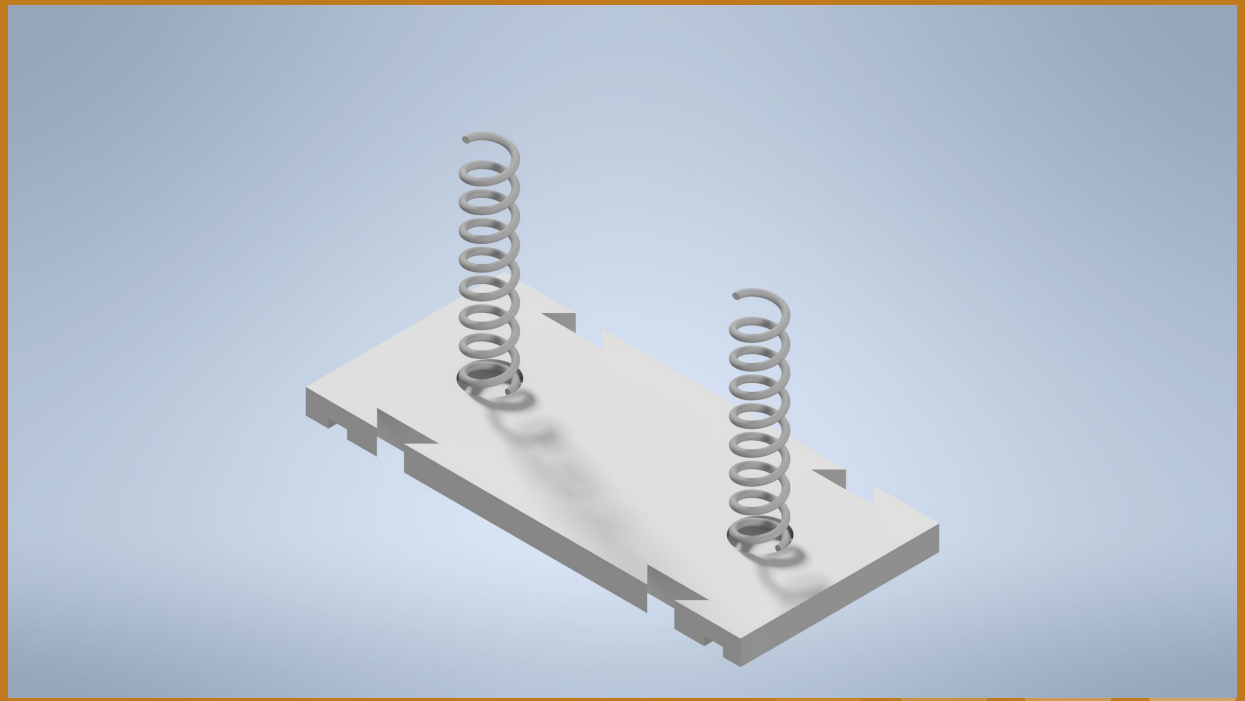


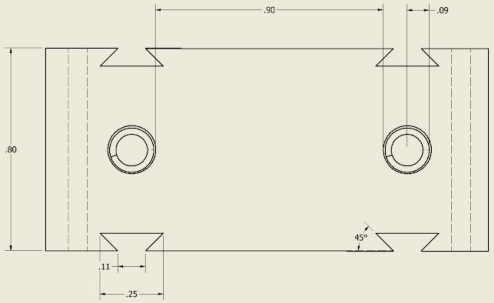


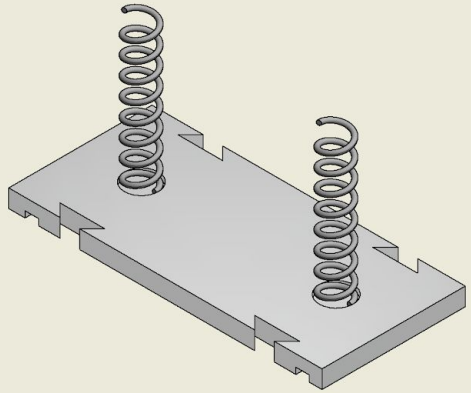
DRAWN Ben Walter	1/12/2020	Cranbrook Robotics - 39k	
CHECKED Aishwarya Kannan		TITLE	
QA		TOP PLATE DRAWING	
MFG			
APPROVED		SIZE D	DWG NO 2 REV
		SCALE 6 : 1	SHEET 1 OF 1

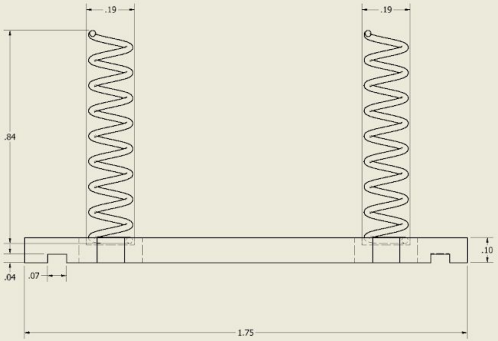
Bottom Plate

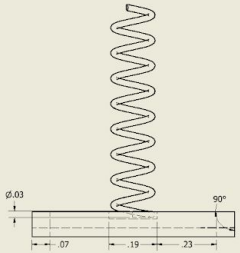
This is the bottom plate of our design. This piece holds the springs, and can be move up and down in order to control the tension of the system. The groove on the bottom is for the bar the holds it when adjusted.





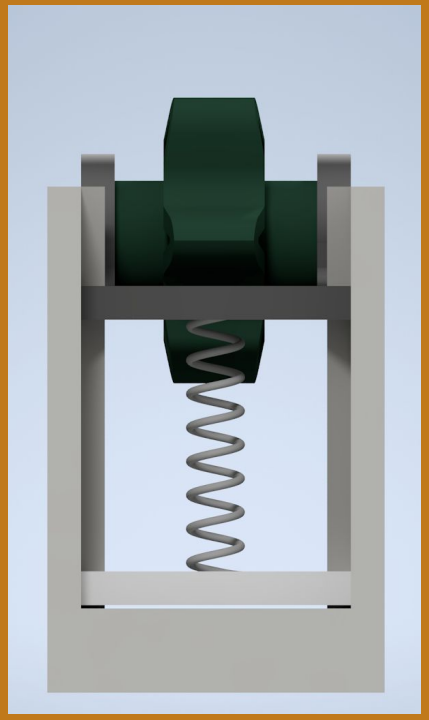




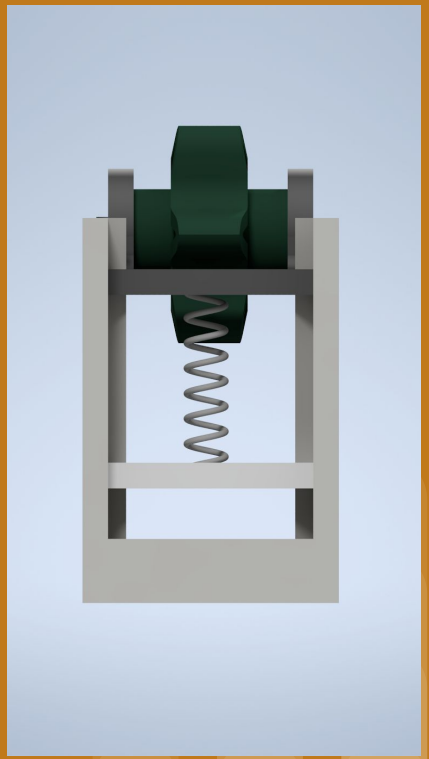
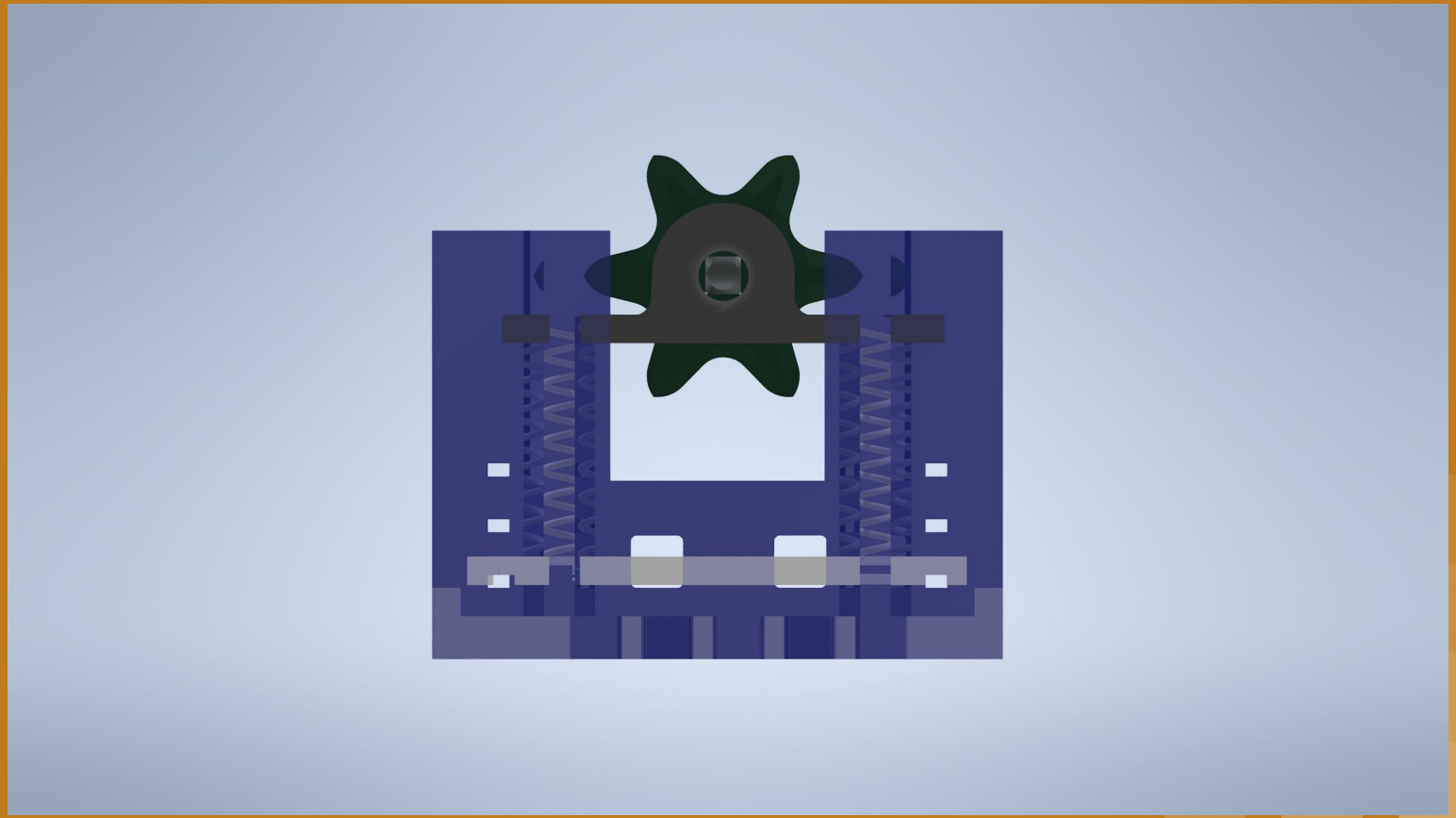


DRAWN Ben Walter	1/11/2020	Cranbrook Robotics- 39k	
CHECKED Aishwarya Kannan			
QA		TITLE	
MFG		BOTTOM PLATE DRAWING	
APPROVED		SIZE D	DWG NO 3 REV
		SCALE 5 : 1	SHEET 1 OF 1

Adjustable Tension



This is an example of the adjustable tension. On the left is the lowest tension, which allows for the most amount of play for the top plate. The right is a higher tension setting, which doesn't allow for as much movement. Hidden is a bar spanning across the bottom plate that keeps it in place.



Transparent View