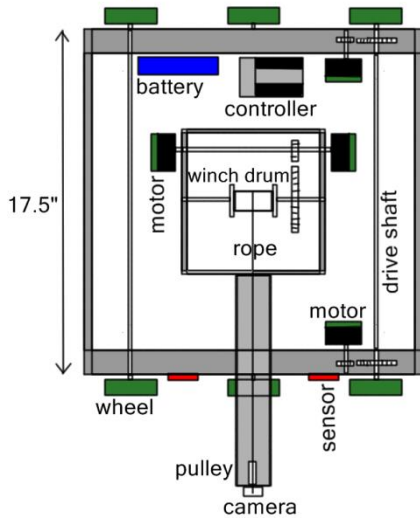


Progress of design process – Mobile Crane

Top view of Mobile Crane

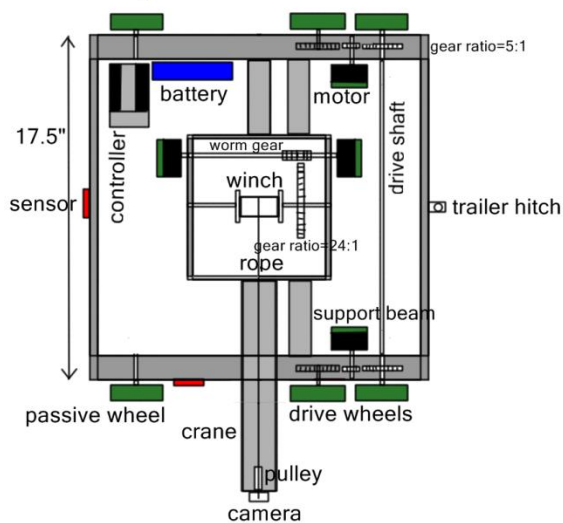


It has six wheeled configuration with rear-wheel drive.

Two motors are used to drive the winch drum, the gear ratio has not been determined at this point.

The lifting component is placed in the center. It is not rotatable in the initial design.

Top view of Mobile Crane

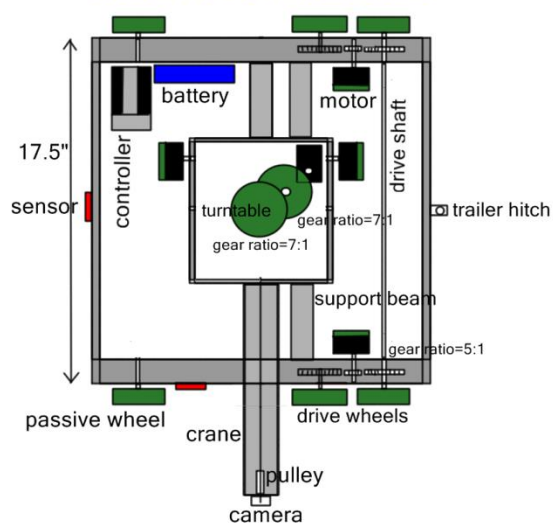


We decide to switch from spur gear to worm gear because it resists back-driving. The gear ratio is 24:1.

As we focus of stability, the drive train becomes 4-wheeled drive to increase traction.

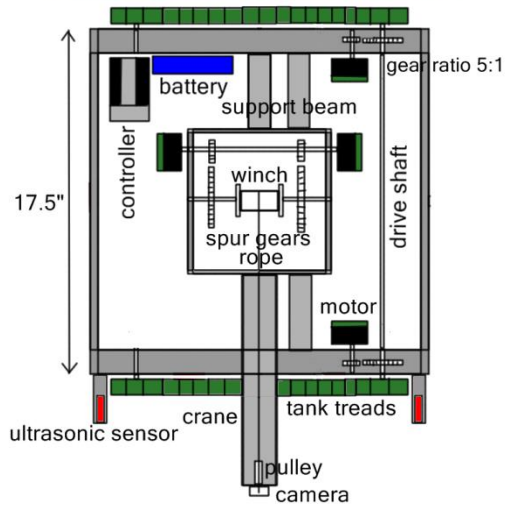
Two support beams are laid down to prepare to assemble turntable and mate the lifting component to the chassis.

Bottom view of Mobile Crane



The bottom view shows the turntable configuration that makes the lifting component rotatable.

Final version of Mobile Crane



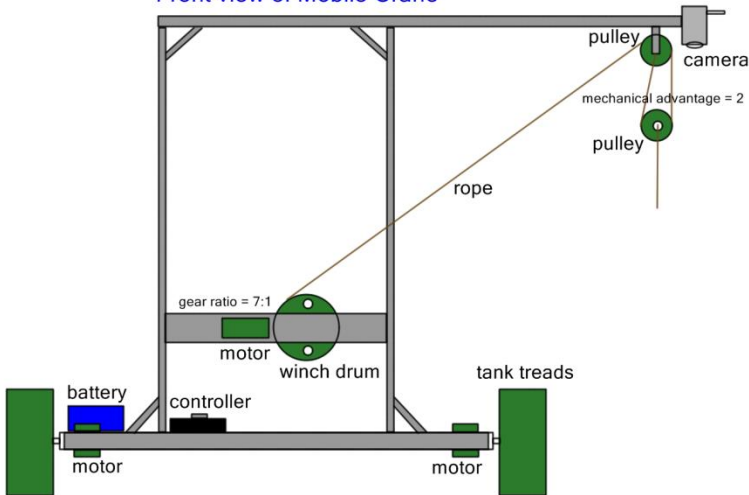
We determine that the high gear ratio 24:1 cannot deliver the speed requirement. We replace it with two high strength spur gears.

Since the crane is moving, we cannot use outriggers to improve stability. We decide to change the drive train to tank treads for extra traction. The crane becomes a crawler crane.

We put two ultrasonic sensors to keep the robot a certain distance away from the edge of building.

We also remove the trailer hitch as we drop the idea of towing a trailer.

Front view of Mobile Crane



To trade off speed with torque, we can put a simple pulley system to gain mechanical advantage of 2 as an option.