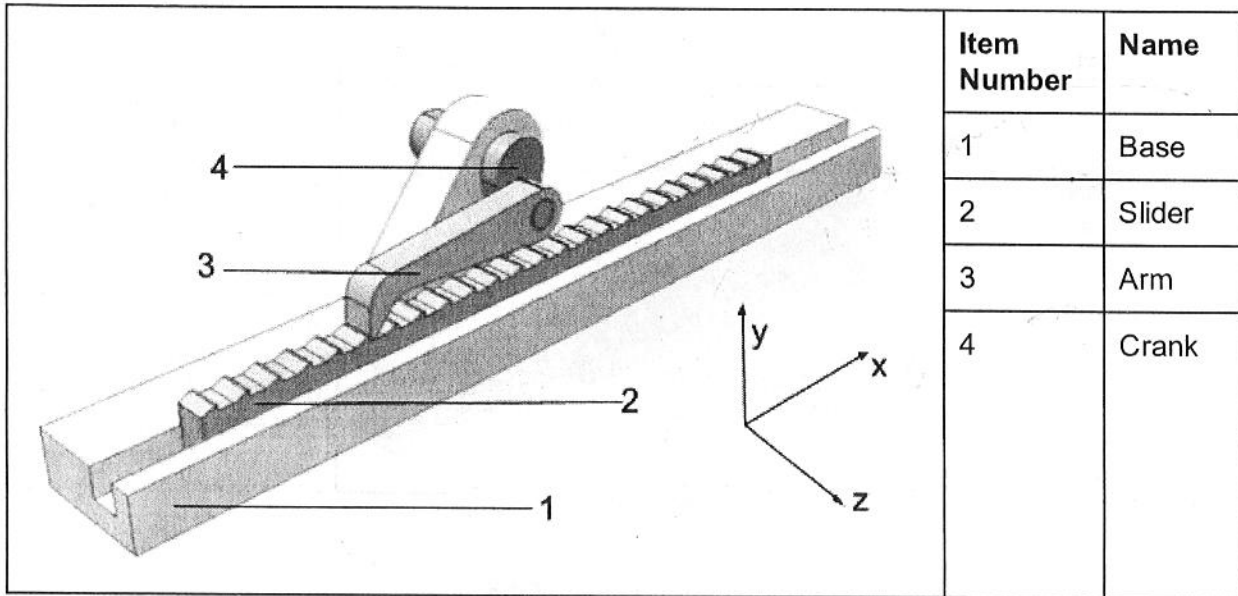


Analysis of Mechanisms

Mechanism #1

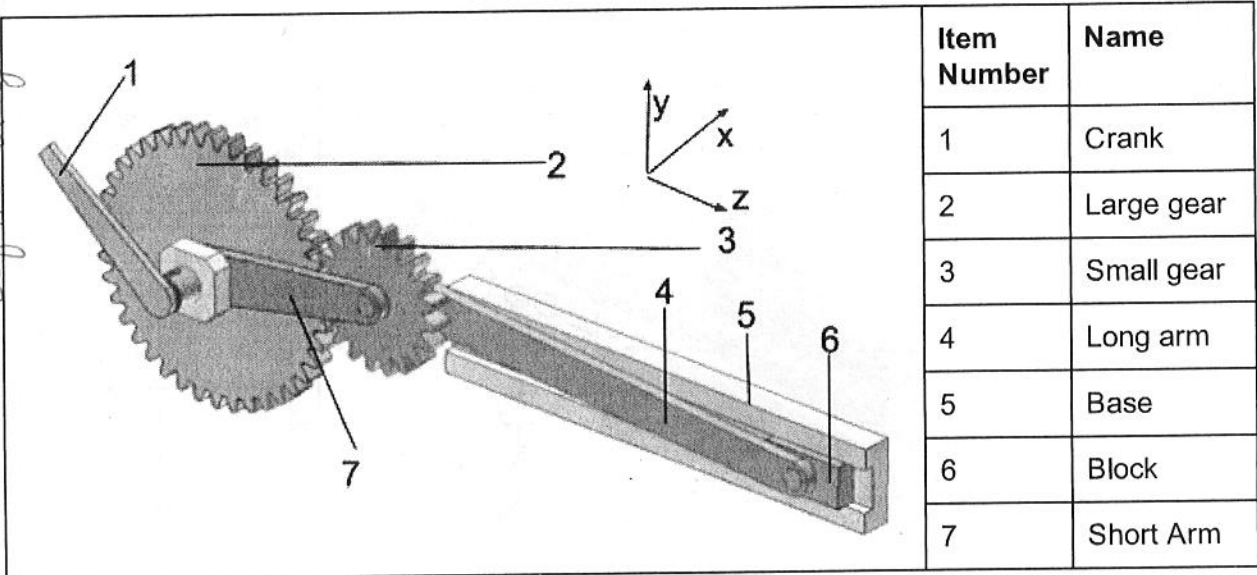
Consider the ratchet mechanism illustrated below. (You can view the animation at: <https://www.youtube.com/watch?v=GSABM0GR-j8>.)



- Which component is the
 - Driver component? *the crank*
 - Driven component? *the slider*
 - Intermediate component? *the arm*
- Give the type of motion and direction of motion of the
 - Crank *rotational z*
 - Slider *translational x*
- What type of guiding is provided by the:
 - Base? *translational x*
 - Crank? *rotational z*
- Is this a motion transmission or motion transformation system? Justify your answer. *change of type of motion = rotation → translation*
- Consider the link between the the arm and the crank. Explain why the link must be complete or partial. *arm must be able to move*
- Is this mechanism reversible? Justify your answer. ** in this case the system is not Rev =*
- As it is currently set-up, the arm jumps ahead by 2 teeth with each rotation of the crank. What modification could be done in order for the arm to jump ahead 1 tooth with each rotation of the crank? *it would jam even though slider-crank is rev.*
 - shorter arm*
 - attach arm closer to the centre of rotation for smaller rotation*

Mechanism #2

Consider the mechanism illustrated below. (You can view the animation at: <https://www.youtube.com/watch?v=QSRgQfbgLjl>.)



Item Number	Name
1	Crank
2	Large gear
3	Small gear
4	Long arm
5	Base
6	Block
7	Short Arm

Explanation
 The gears must "mesh" therefore the arm must be the sum of the radii of the 2 gears + r_{large} + r_{small}

- Give the type of motion and direction of motion of the
 - Crank *rotation x*
 - Block *translation z*
 - Large gear *rotation x*
- Why must the link between the crank and the large gear be complete? *They have to turn/rotate tog.*
- Why must the link between the short arm and the small gear be partial? *the connection of the short arm has to rotate freely inside*
- Because of an error in manufacturing, the long arm is longer than it should be. What is a consequence of this error? How does it affect the functioning of the mechanism? *the block may come off the base or won't go back as far*
- What parts dictated the size of the short arm? Explain. *the size of large gear + small gear*
- Over time, the block has started to get stuck in the base. What could be done to fix this issue?

- lubrication*
- the wood may have warped ∴ sand or plane*
- replace parts*