ME352A - Lab 1

Hints:

1. *Use SPACERS/WASHERS, along with PINS, to allow free rotary motion in between the connected links.*
2. *Use CIRCLIPS to lock the PINS on both sides of the axis point.*
3. *Use SCREW and WINGNUT to ground a link.*

Wingnut and Screw

Circlip

Spacer

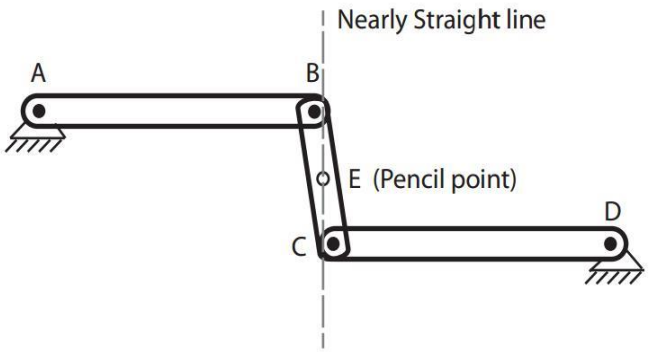
Make the following mechanisms using the kit provided.

Mechanism 1A: Watt's Mechanism

Task: Assemble the mechanism with help of the kit. Hold the pencil at E and trace a curve of your choice and: -

Report:

1. Report the curve traced by the pencil at point E *(get it signed by TA).*
2. Is the traced curve truly a straight line? Comment and provide a suitable explanation.
3. Draw the complete curve. Is it an open curve or a closed one? Name the curve.
4. This curve is termed as a _____ curve, because the link BC is a _____ link.
   (Fill in the above two blanks with the same word!)

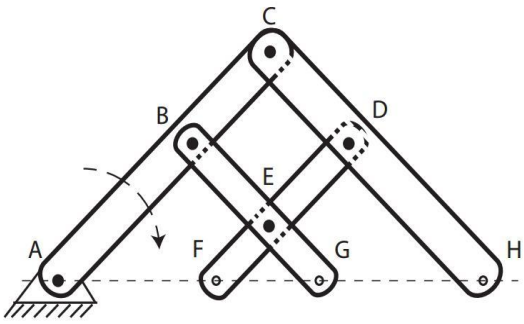


Mechanism 1B: The Multi-bar Pantograph Mechanism

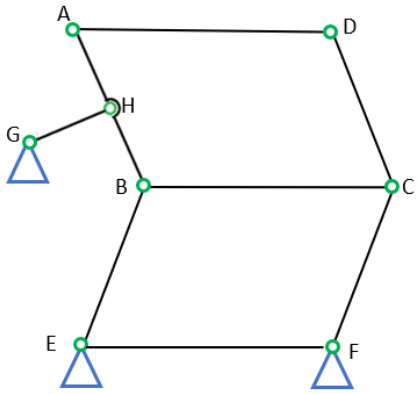
Task: Assemble the mechanism with help of the kit. Hold the pencil at G and trace a curve of your choice and: -

Report:

1. Report the curve traced by the pencil-points F and H (get it signed by TA).
2. Are these two curves enlarged, reduced or the same as the curve you chose? Explain your observation.
3. How does doubling or halving of a curve depend on the lengths of the links?
4. What is the degree of freedom of the mechanism?



Mechanism 1C: Four bar mechanism with a translational link

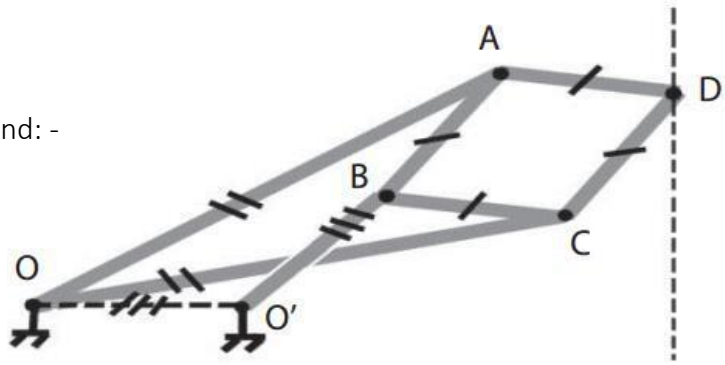


Task: Assemble the mechanism with help of the kit and: -

Report:

1. Enumerate and classify links and pairs, and find out the degree of freedom of the mechanism.
2. How many singular positions does a parallelogram mechanism have?
3. Look at the motion of the topmost link. Observe this motion and comment about it.

Mechanism 1D: Peaucellier-Lipkin Linkage:



Task: Assemble the mechanism with help of the kit.
Hold the pencil at D and trace a curve of your choice and: -

Report:

1. Check that D traces a straight line *(get it signed by TA)*.
2. Write about the link lengths and describe their motions separately.