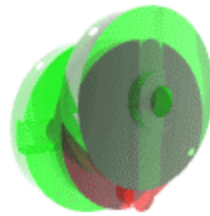


MECHANISMS AND THEIR INVERSIONS



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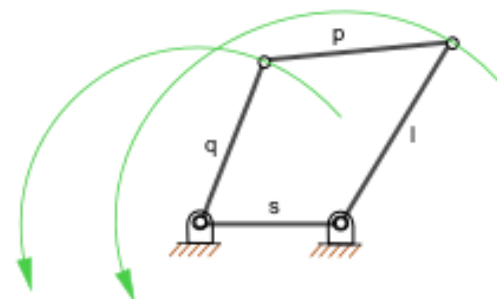
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[C] STEERING GEAR MECHANISMS

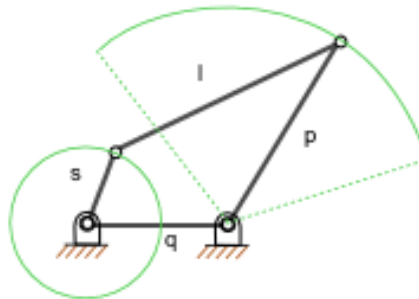
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CONCEPT OF FOUR BAR MECHANISM

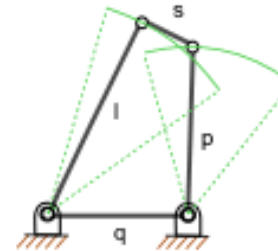


(full revolution,
both links)

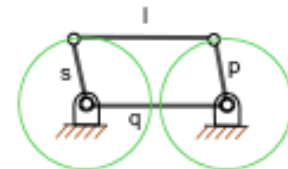
Drag-link
 $s+l \neq p+q$
(continuous motion)



Crank-rocker
 $s+l \neq p+q$
(continuous motion)

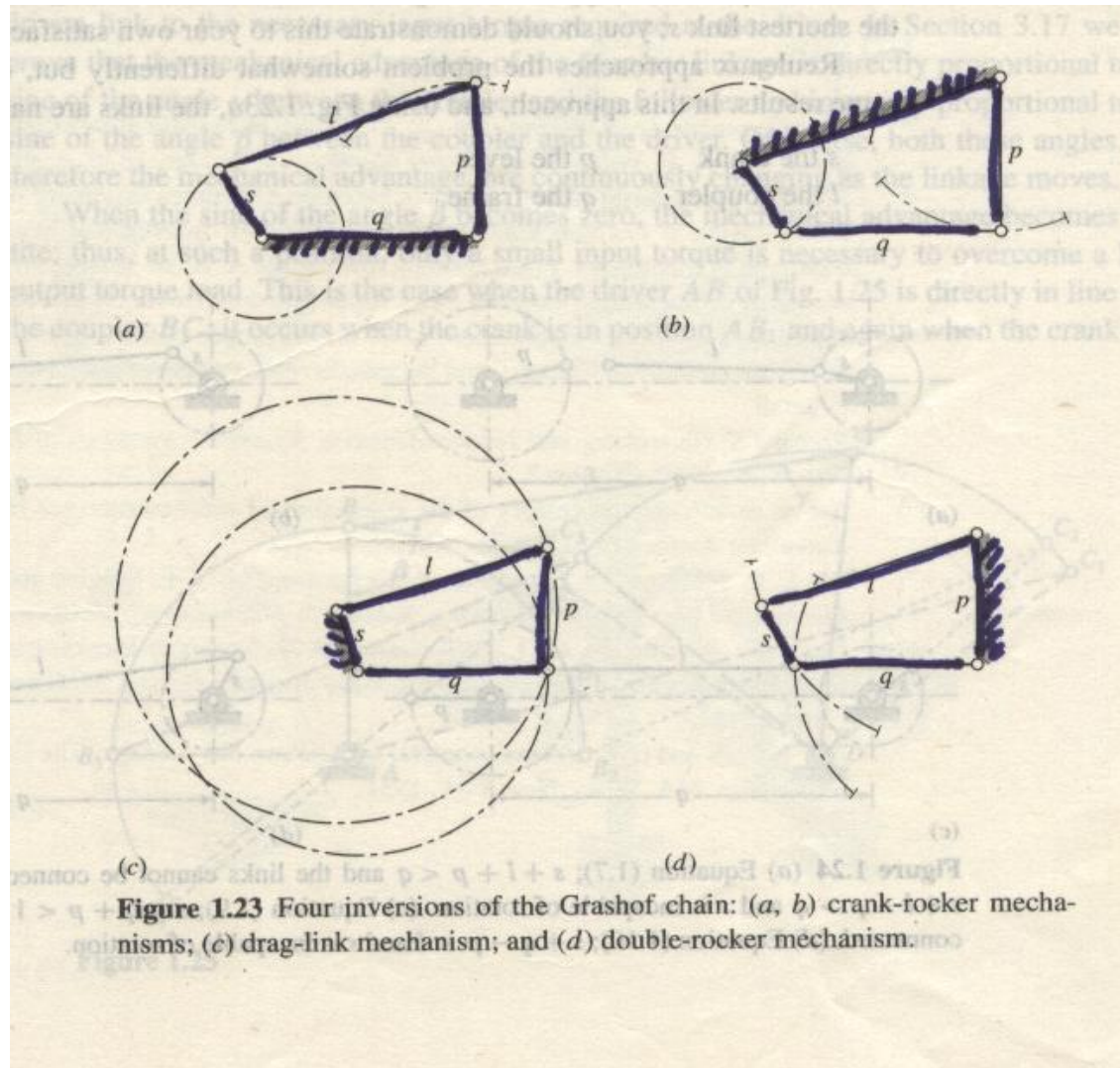


Double-rocker
 $s+l > p+q$
(no continuous motion)

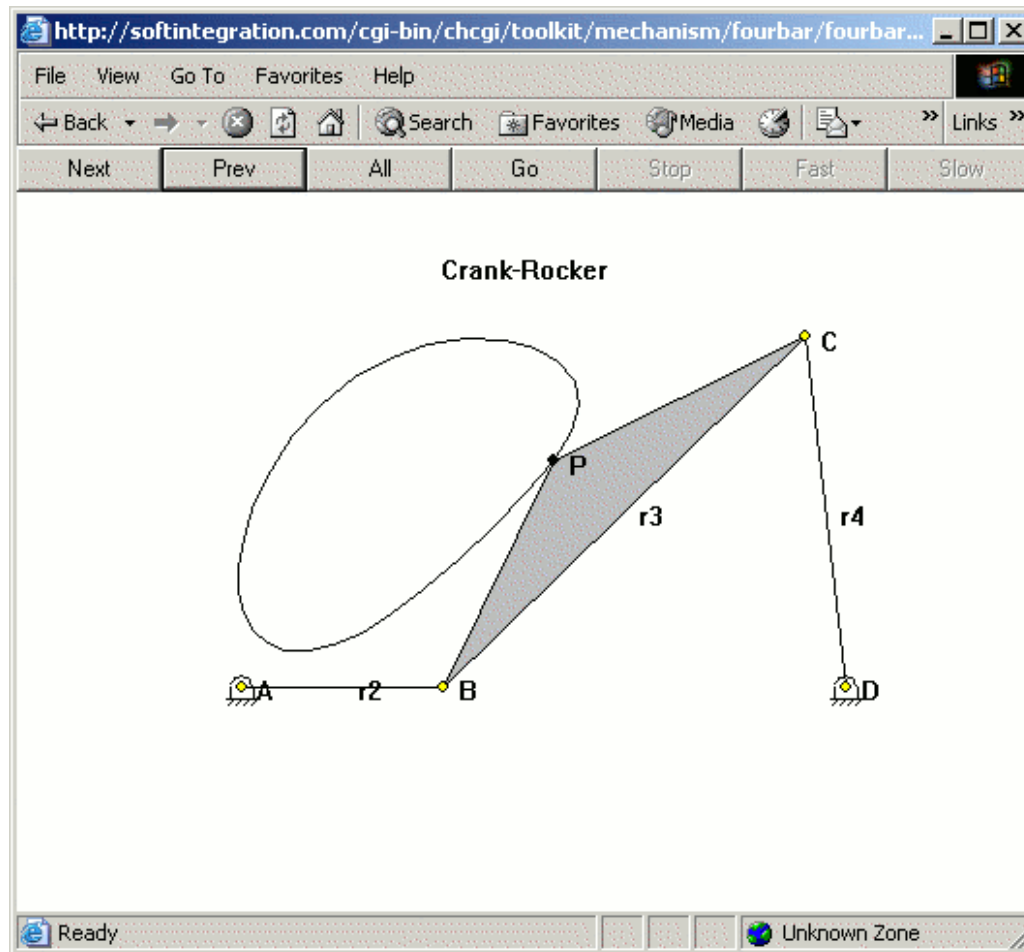


Parallelogram linkage
 $s+l \neq p+q$
(continuous motion)

CONCEPT OF FOUR BAR MECHANISM (Grasof' Law))



CONCEPT OF FOUR BAR MECHANISM (ANIMATION)



CONCEPT OF SINGLE SLIDER MECHANISM (INVERSIONS)

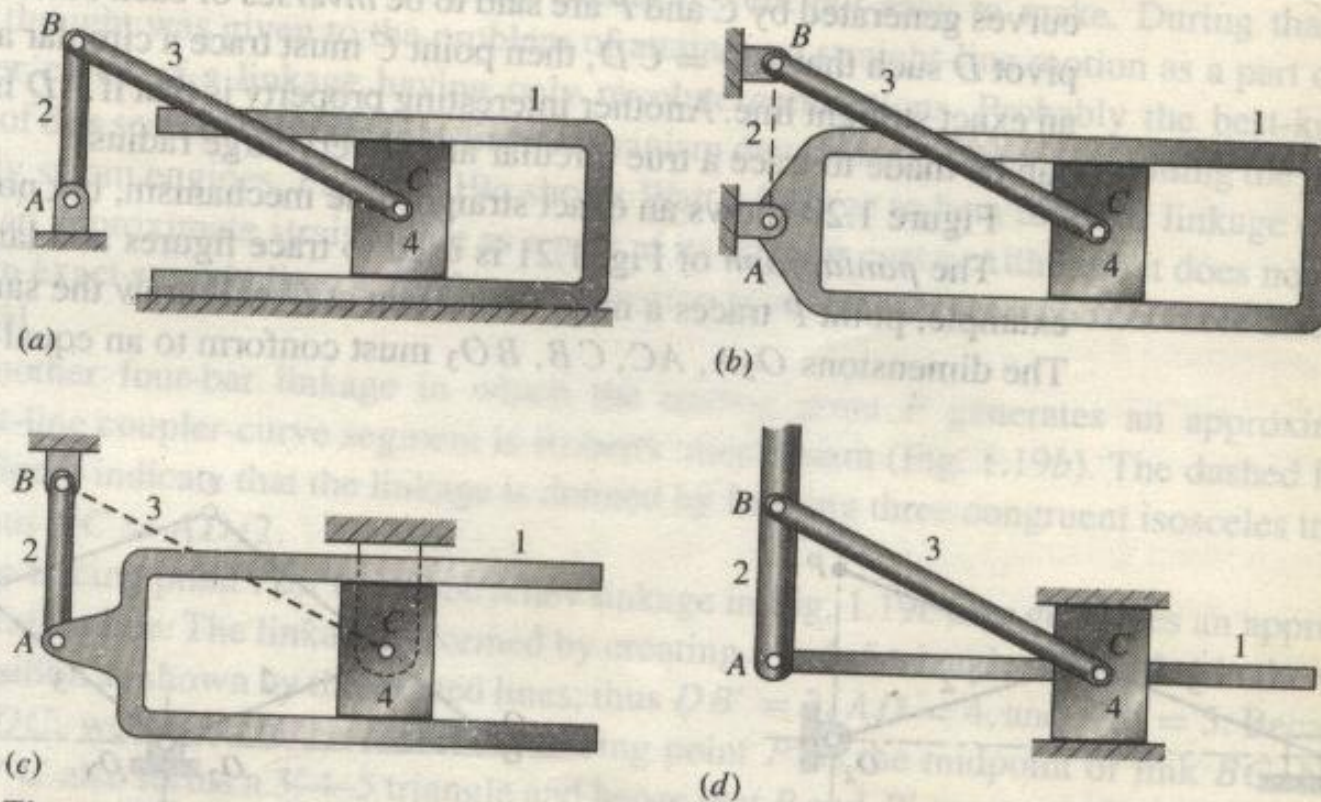


Figure 1.22 Four inversions of the slider-crank mechanism.

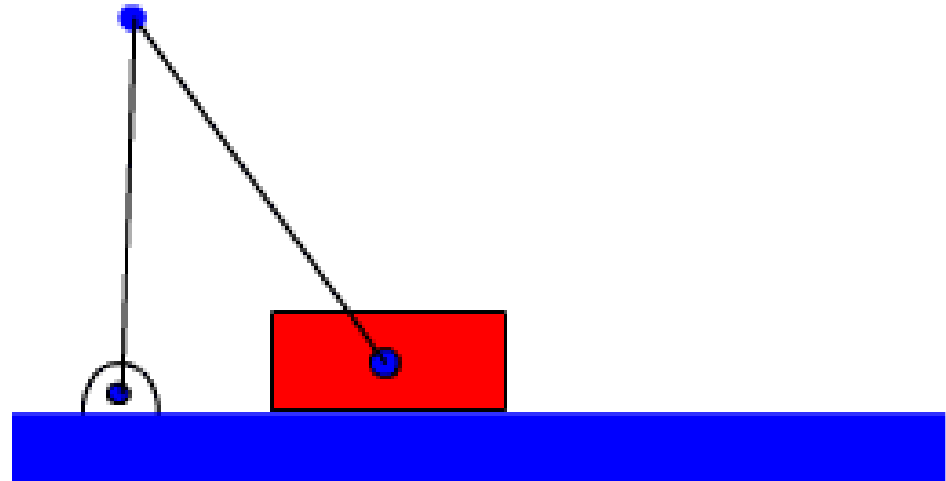
INVERSIONS OF DIFFERENT MECHANISMS

INVERSION OF FOUR BAR CHAIN

- *Beam Engine*
- *Coupling Rod of Locomotive*
- *Watt's Indicator Mechanism*

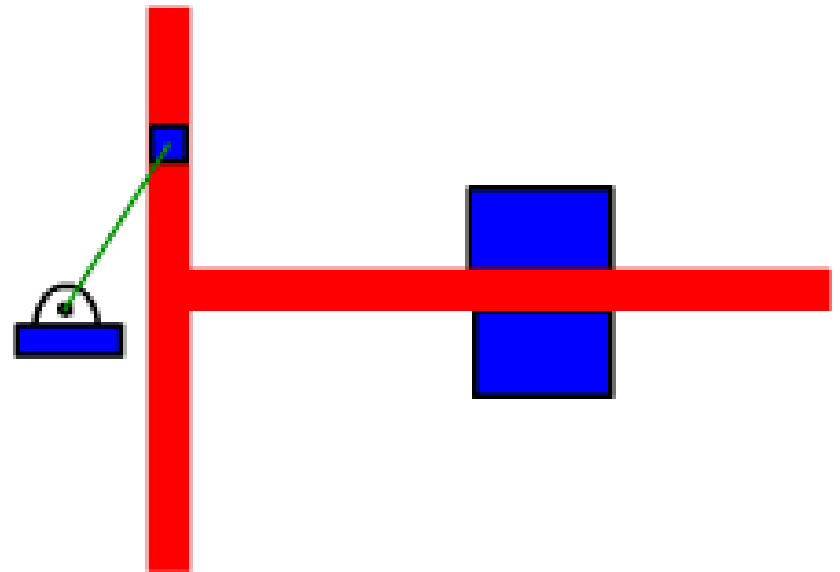
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- *Whithworth Quick Return Motion Mechanism*



INVERSION OF DOUBLE SLIDER CHAIN

- *Elliptical Trammels*
- *Scotch Yoke Mechanism*
- *Oldham's Coupling*



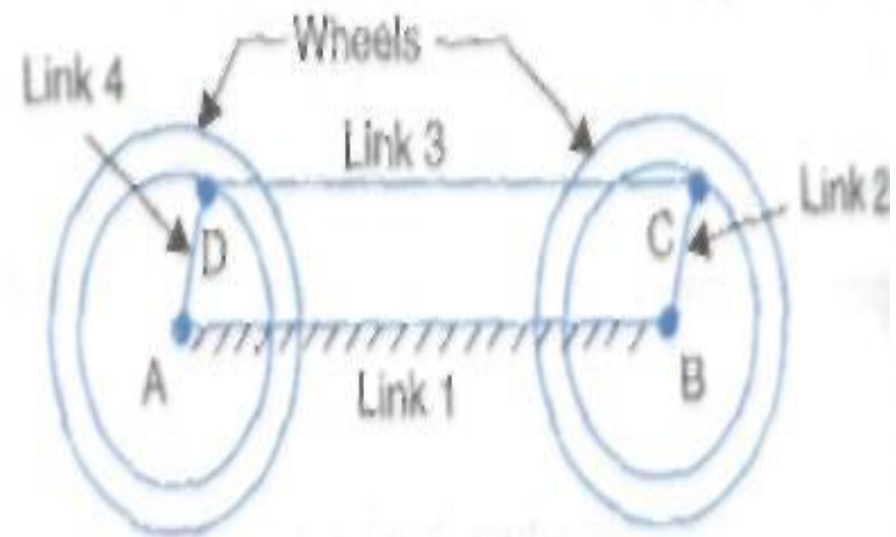
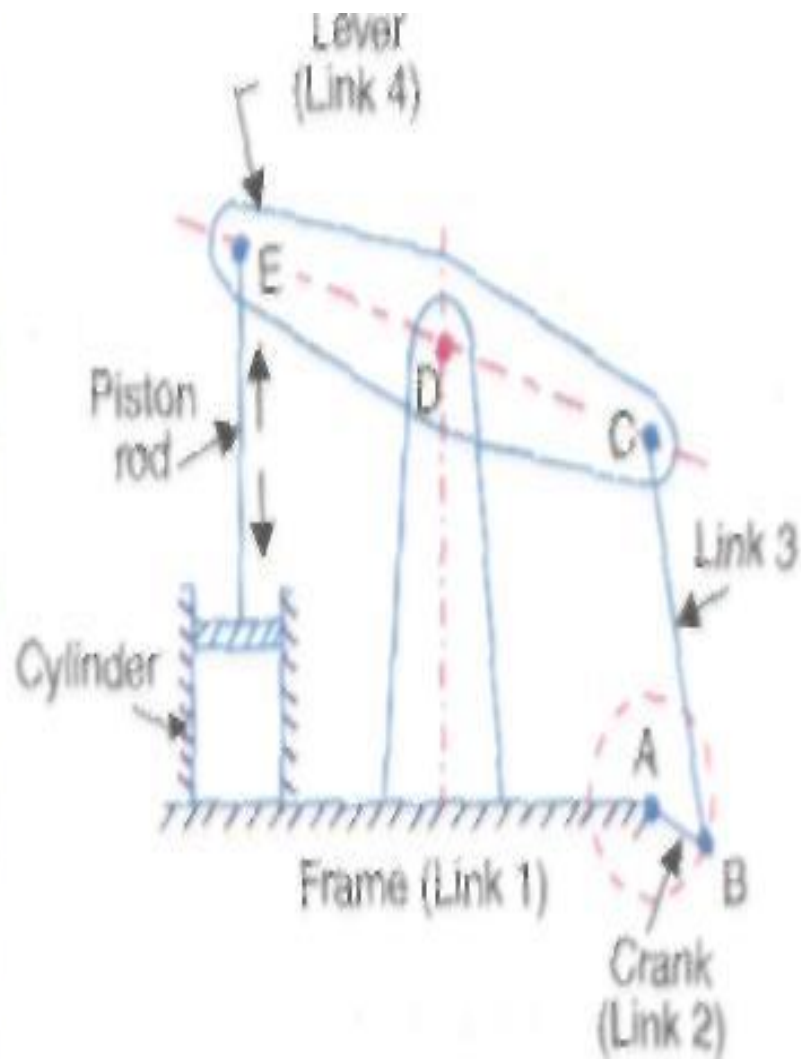
INVERSIONS OF FOUR BAR CHAIN

Beam Engine

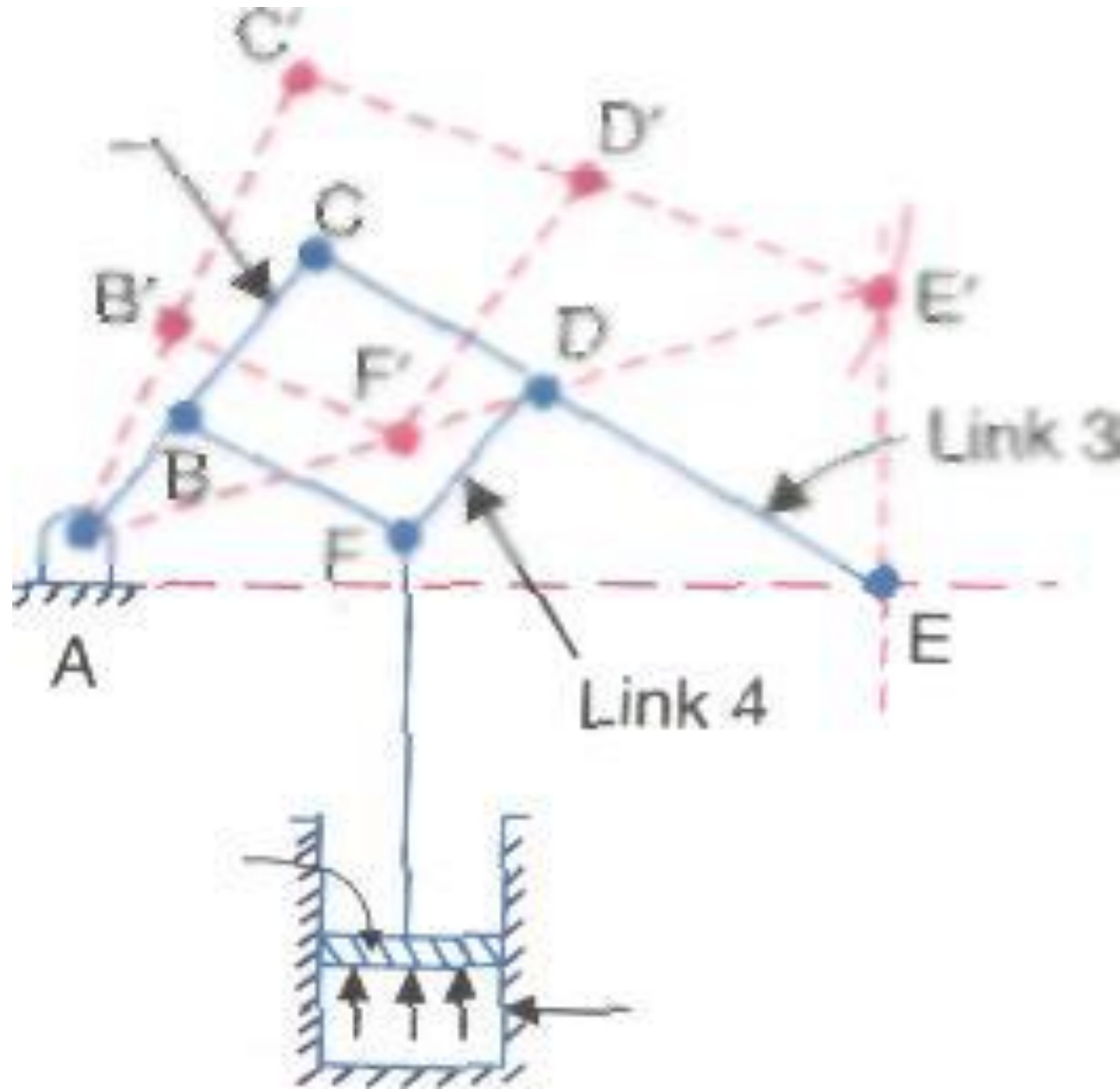
Coupling Rod of Locomotive

Watt's Indicator Mechanism

BEAM ENGINE/COUPLING ROD OF LOCOMOTIVE



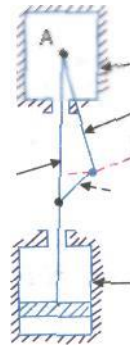
WATT'S INDICATOR MECHANISM



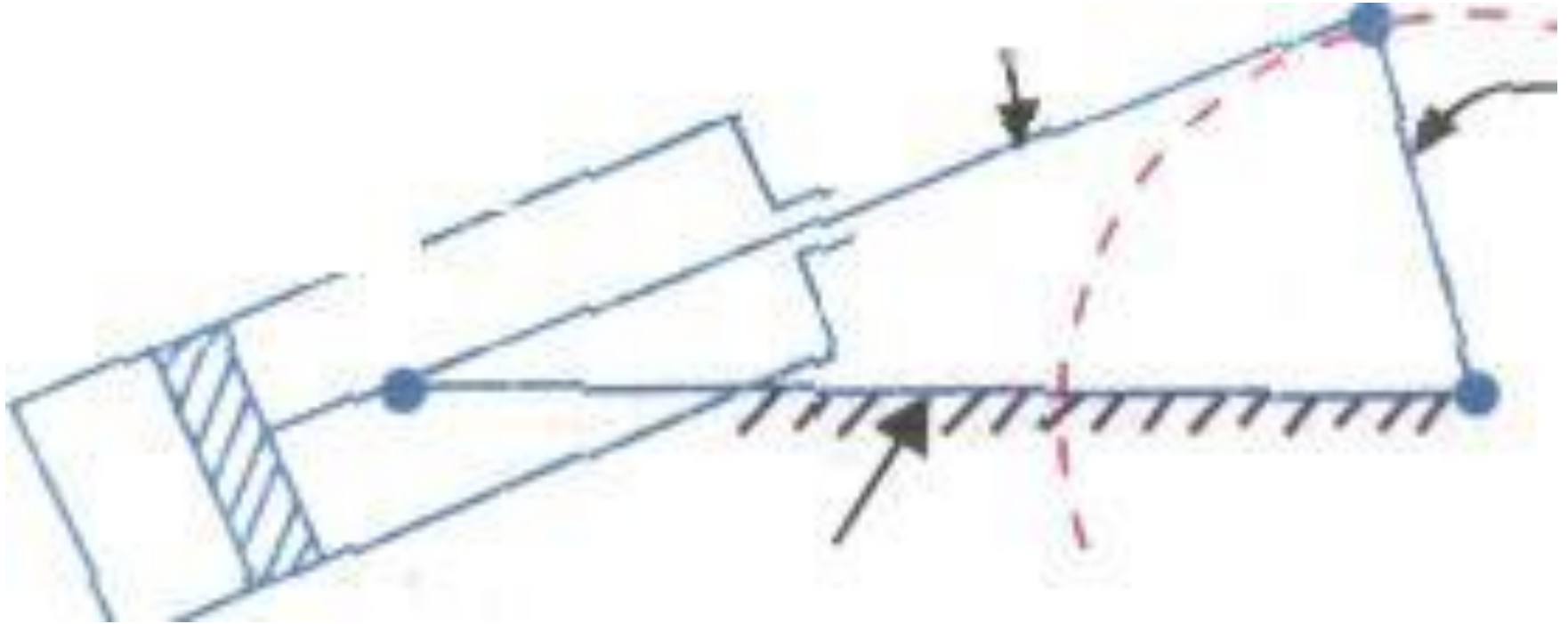
INVERSIONS OF SINGLE SLIDER CHAIN

- *Pendulum Pump (Bull Engine)*
- *Oscillating Cylinder Engine*
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- *Crank and Slotted Lever Quick Return Motion Mechanism*
- *Whithworth Quick Return Motion Mechanism*

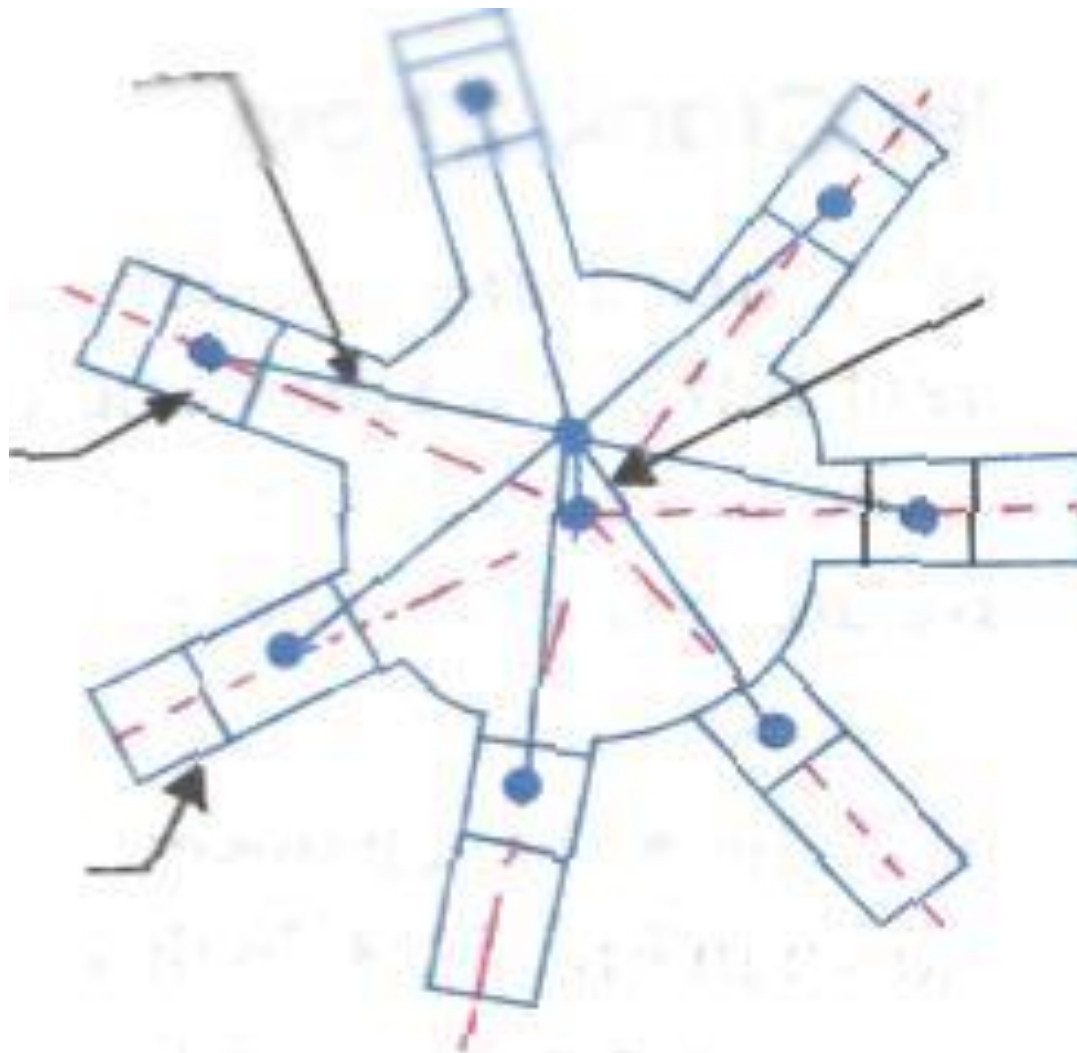
PENDULUM PUMP (BULL ENGINE)



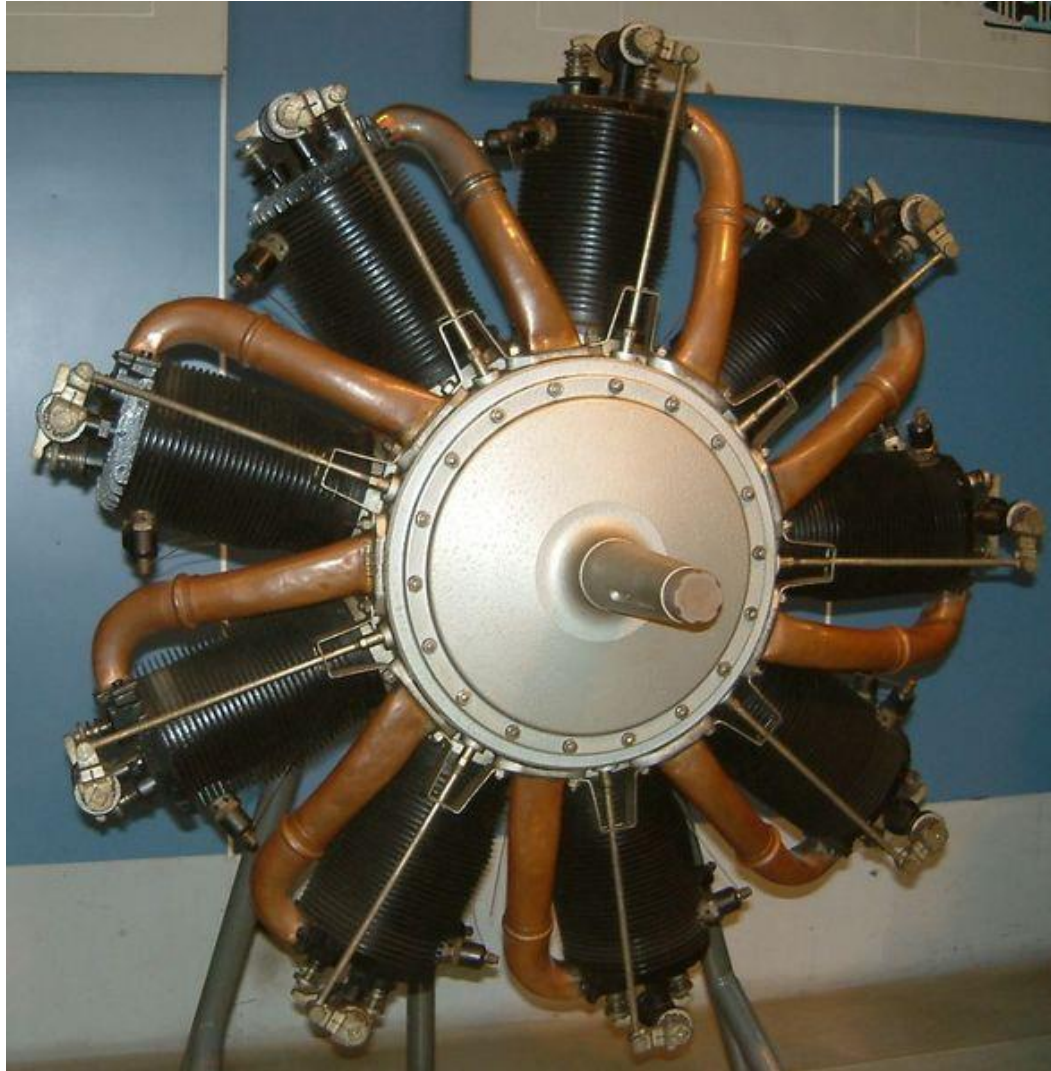
OSCILLATING CYLINDER ENGINE



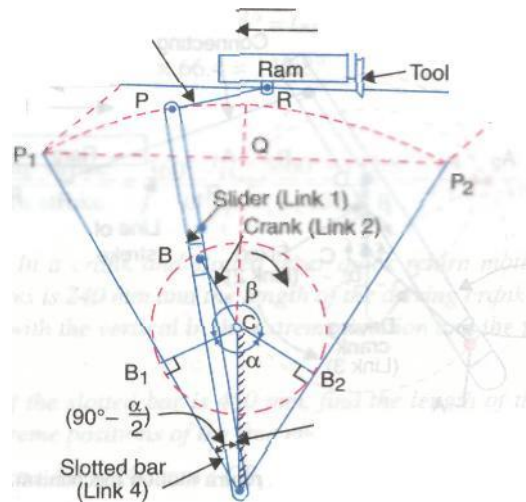
ROTARY INTERNAL COMBUSTION ENGINE (GNOME ENGINE)



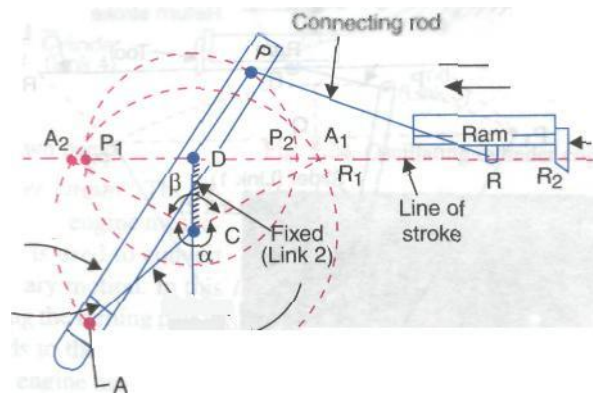
ROTARY INTERNAL COMBUSTION ENGINE (GNOME ENGINE)



CRANK AND SLOTTED LEVER QUICK RETURN MOTION MECHANISM



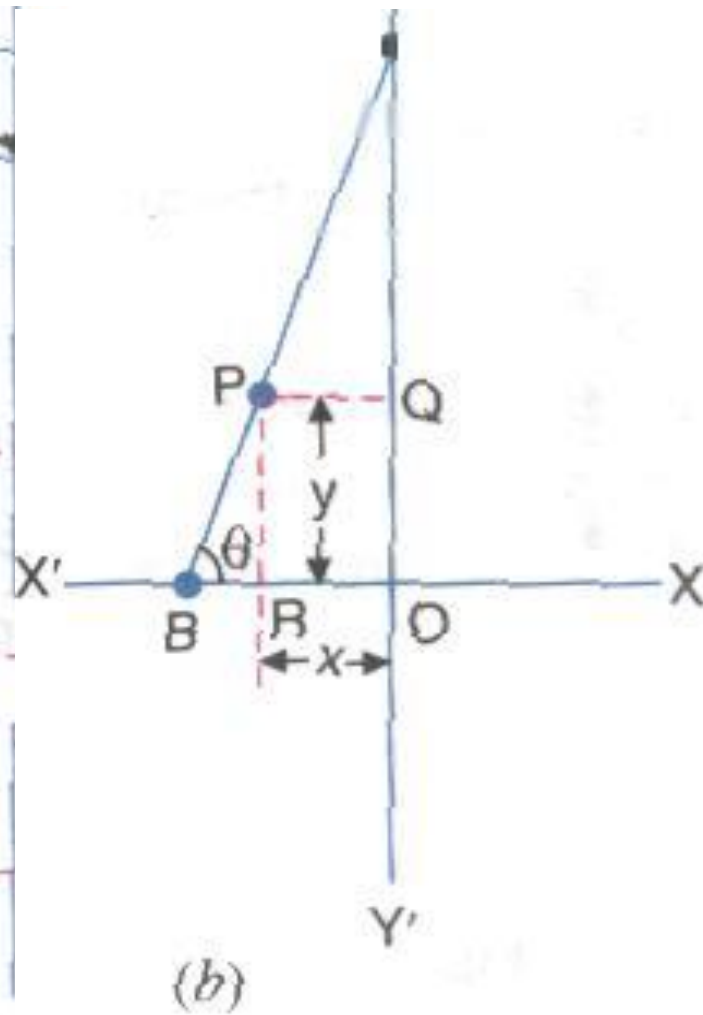
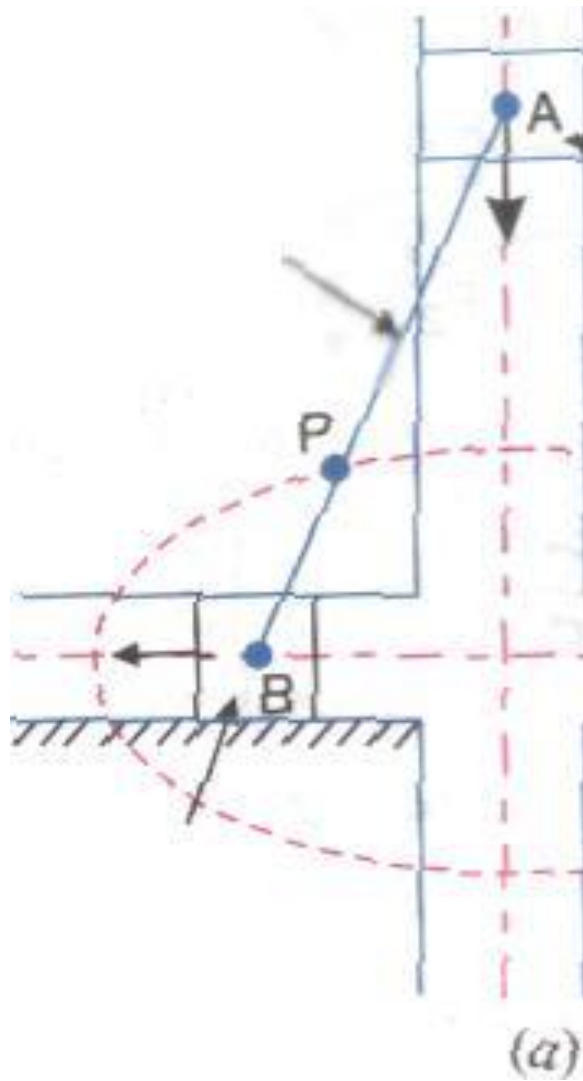
WHITHWORTH QUICK RETURN MOTION MECHANISM



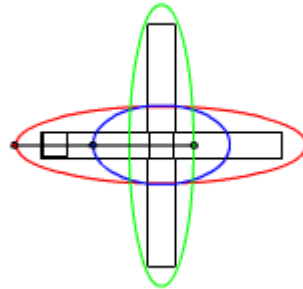
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- *Elliptical Trammels*
- *Scotch Yoke Mechanism*
- *Oldham's Coupling*

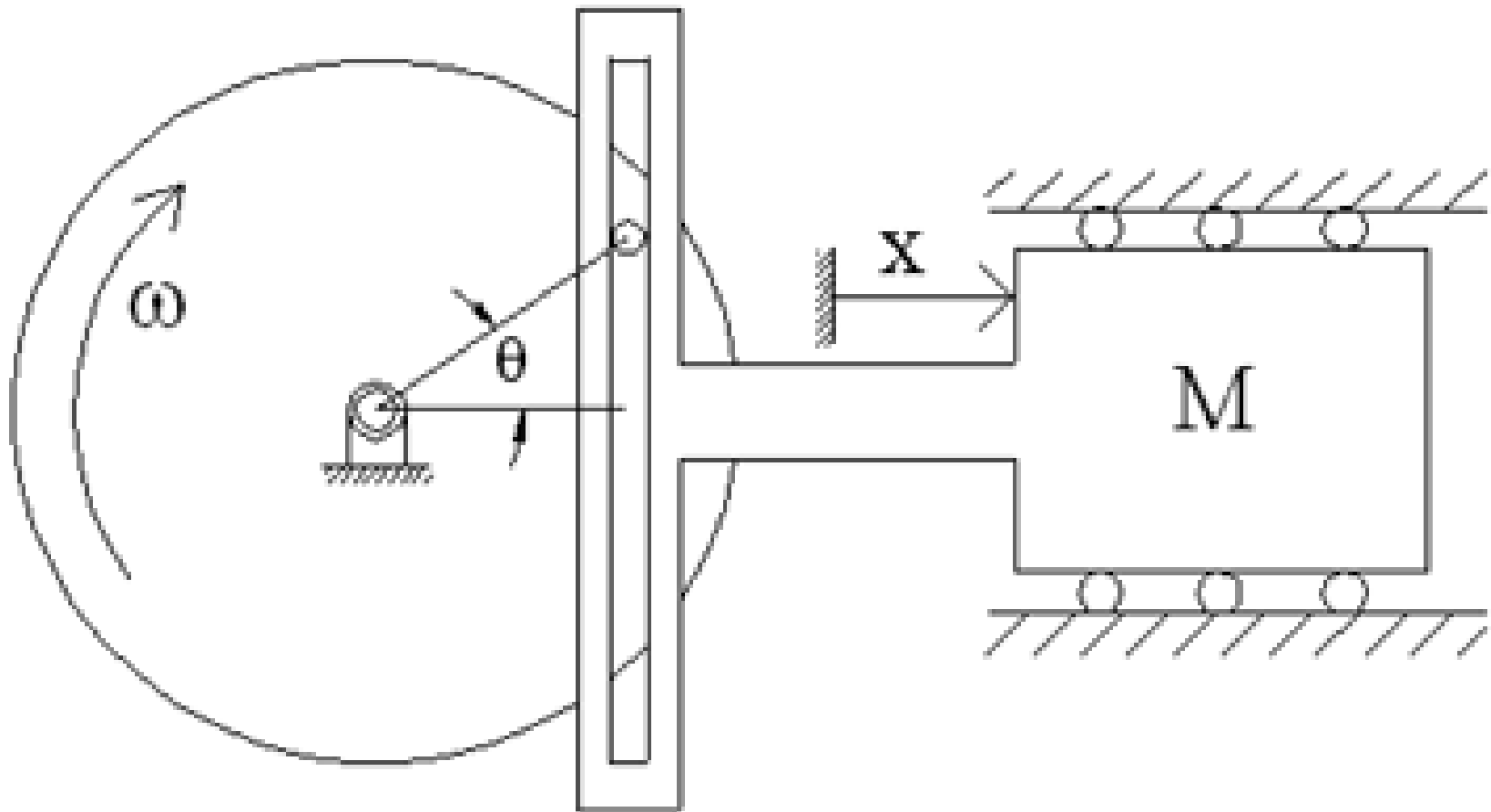
ELLIPTICAL TRAMMELS - 1



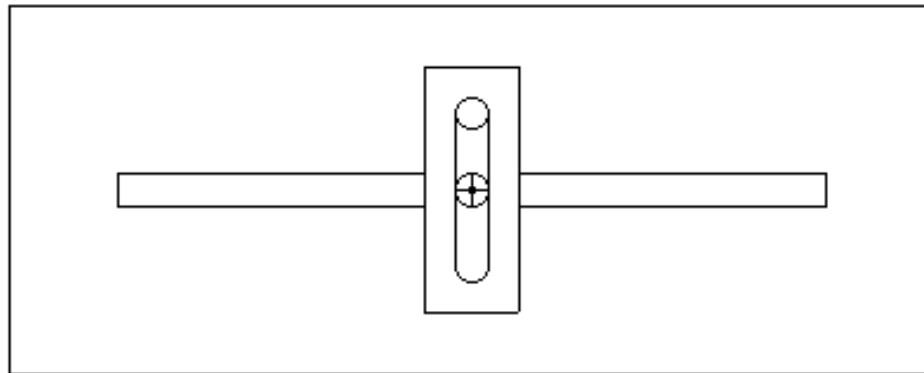
ELLIPTICAL TRAMMELS - 2



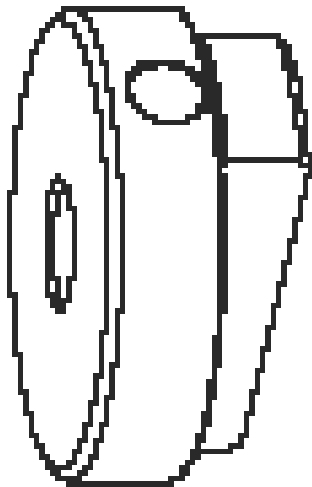
SCOTCH YOKE MECHANISM - 1



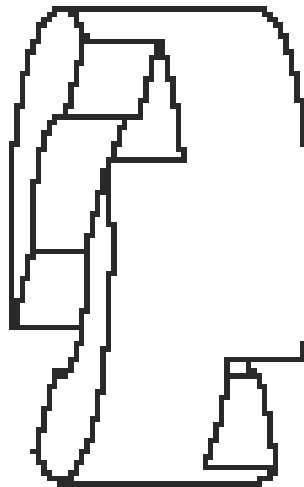
SCOTCH YOKE MECHANISM - 2



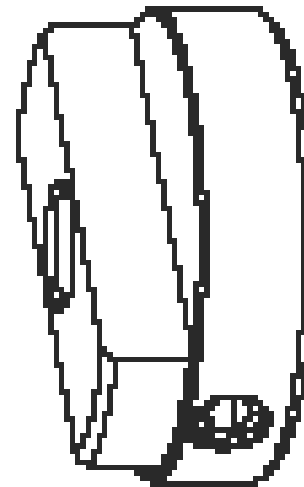
OLDHAM'S COUPLING-1



Hub
(Aluminium alloy)

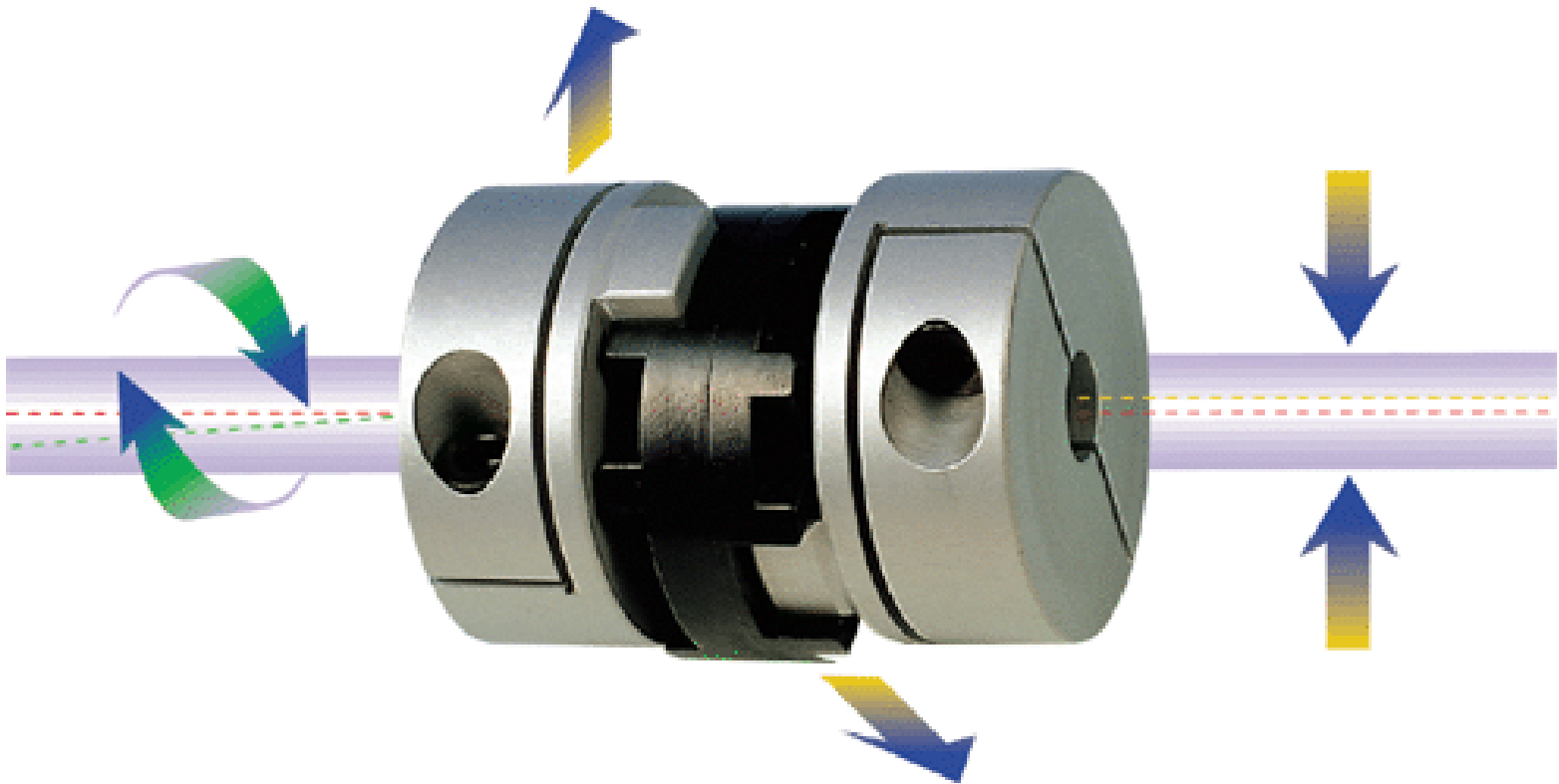


Torque Disc
(Acetal compound)

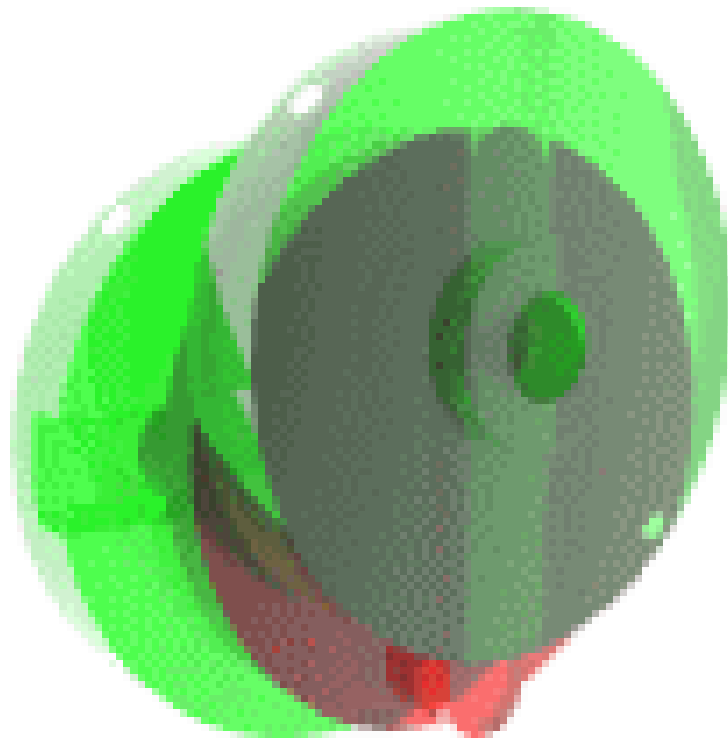


Hub
(Aluminium alloy)

OLDHAM'S COUPLING-2



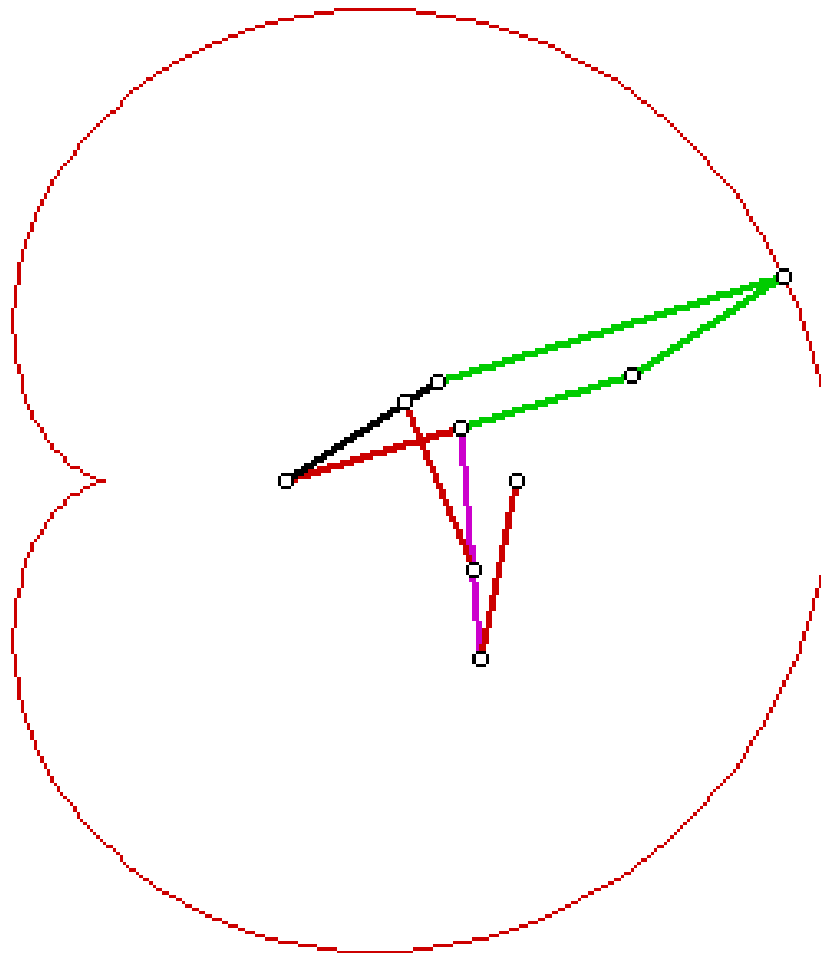
OLDHAM'S COUPLING-3



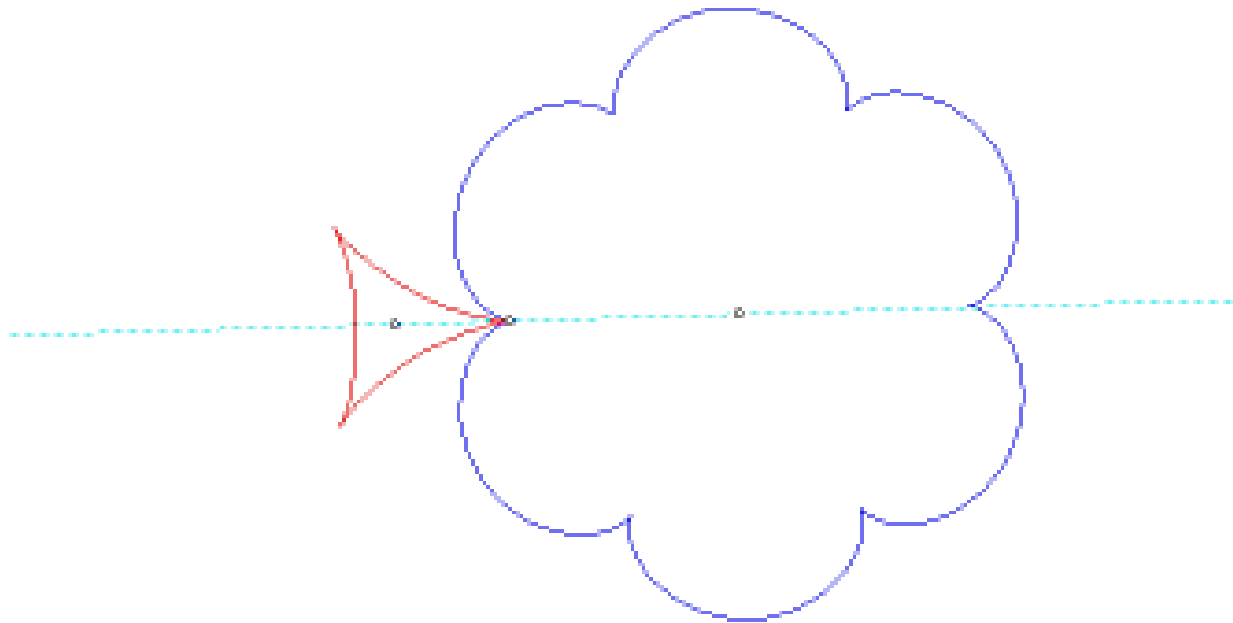
OTHER MECHANISMS

TO UNDERSTAND THE CONCEPT OF
MOTIONS OF MECHANISMS

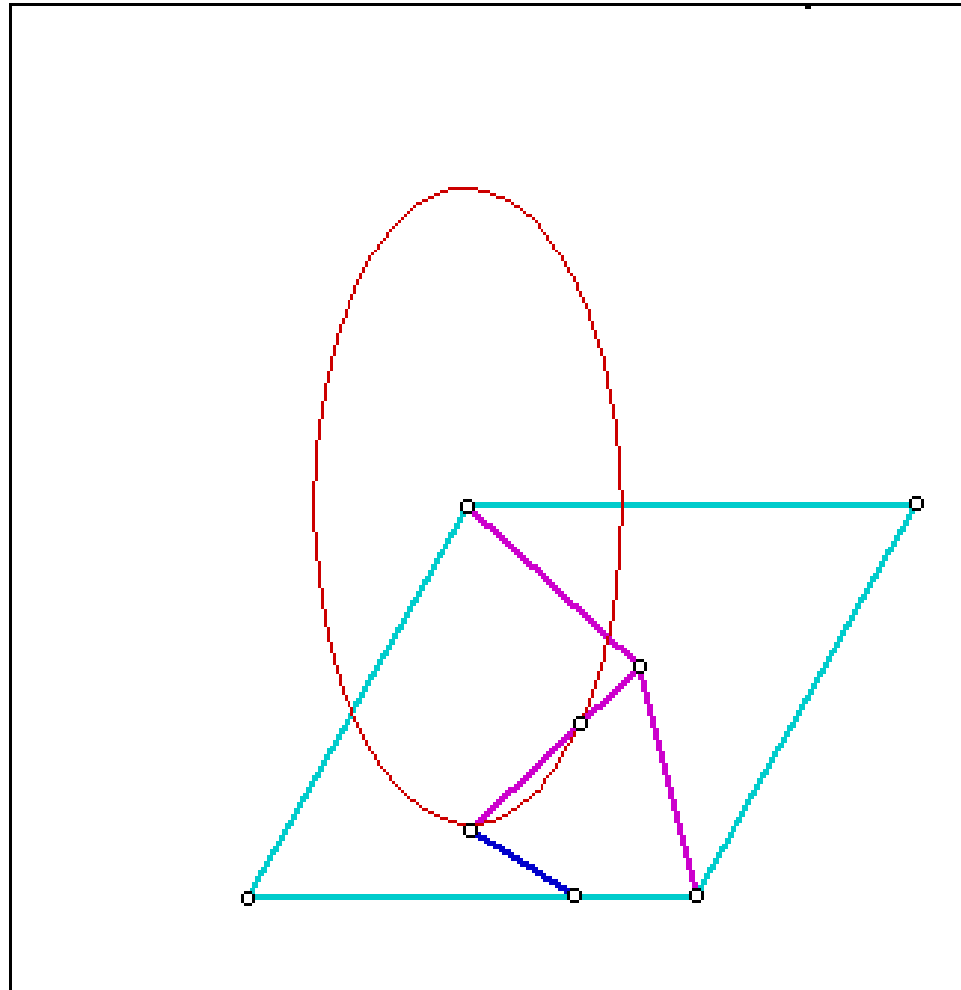
MECHANISM - 1



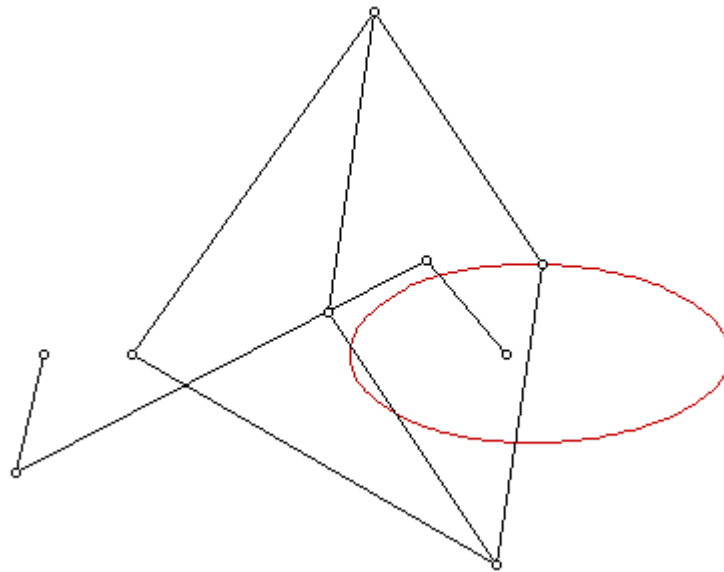
MECHANISM - 2



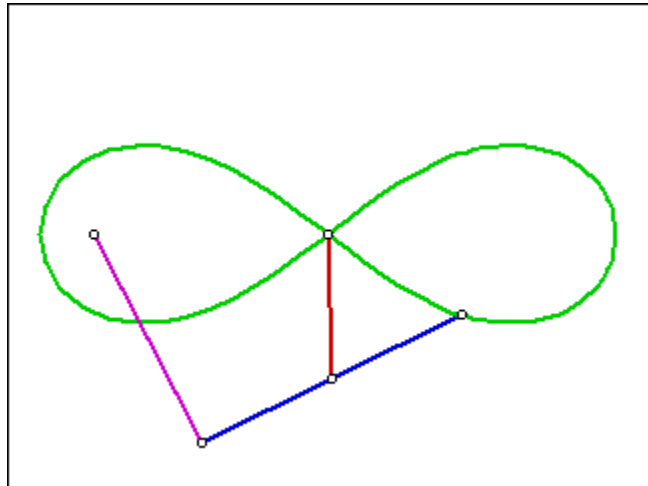
MECHANISM - 3



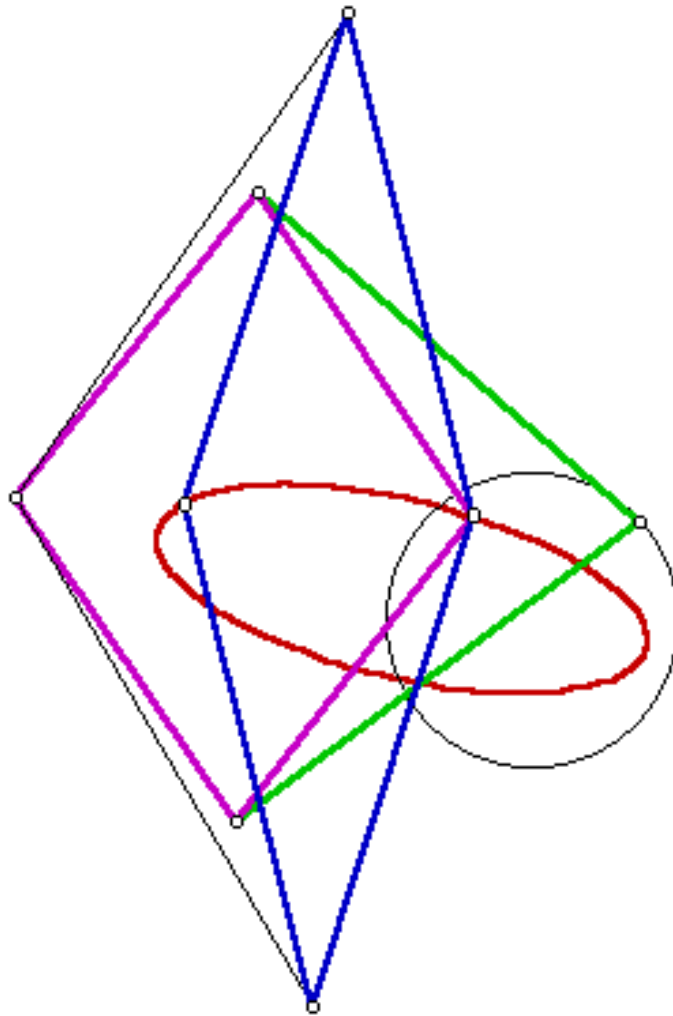
MECHANISM - 4



MECHANISM - 5



MECHANISM - 6



STRAIGHT LINE MECHANISMS

STRAIGHT LINE MOTION MECHANISM

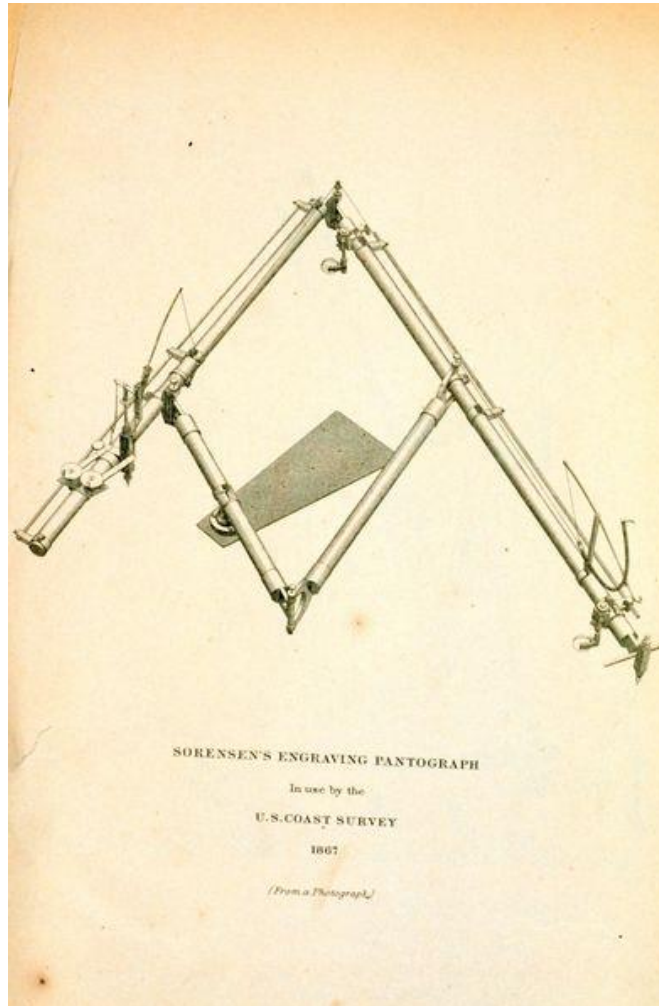
Exact Straight Line Motion Mechanism

1. Pentograph
2. Peaucellier Mech.
3. Hart's Mechanism

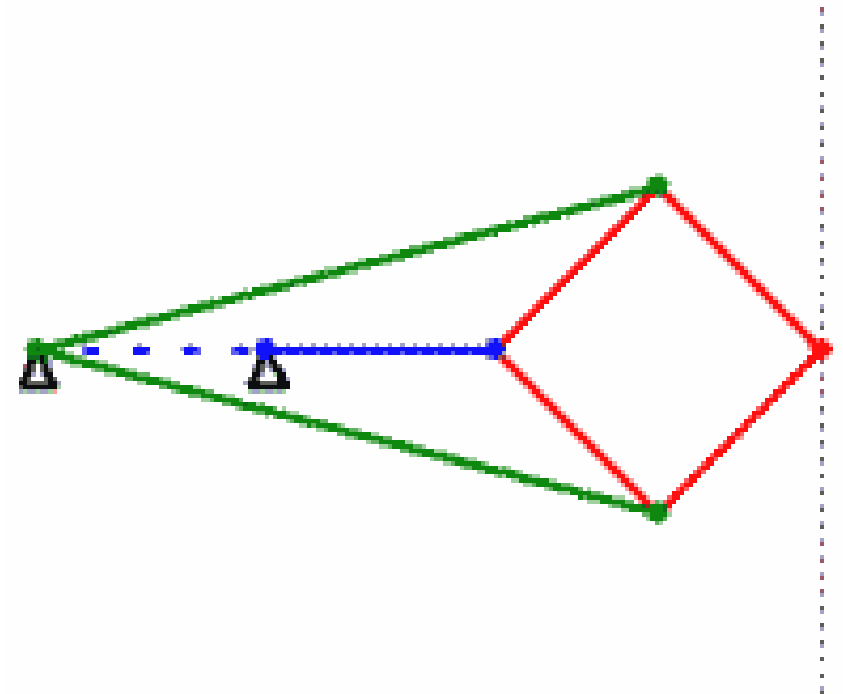
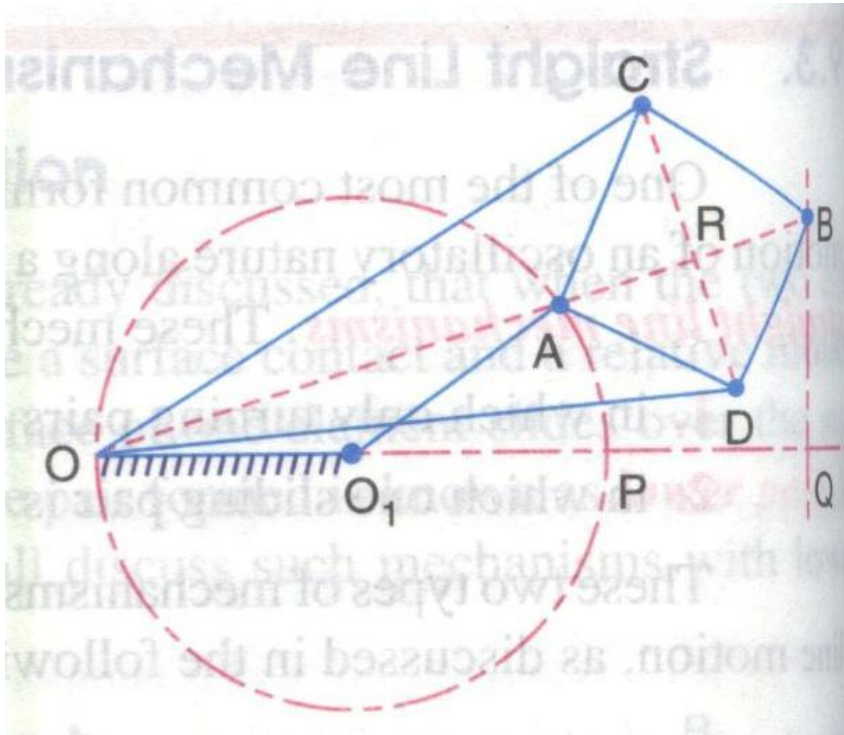
Approximate Straight Line Motion Mechanism

1. Watt's Mechanism
2. Modified Scotch Russel Mechanism
3. Grasshoper Mech.
4. Tchebichef Mech.
5. Roberts Mechanism

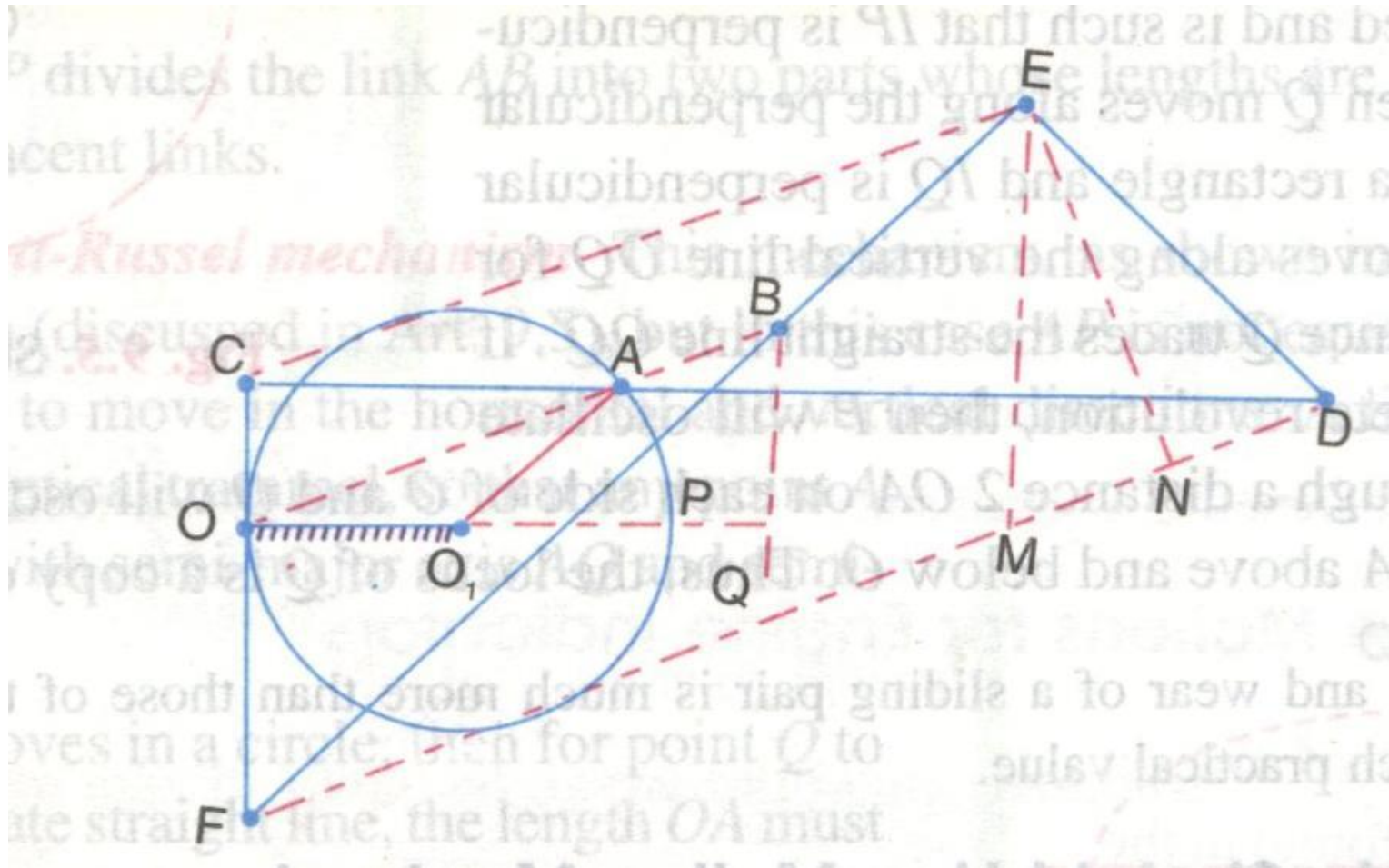
PENTOGRAPH



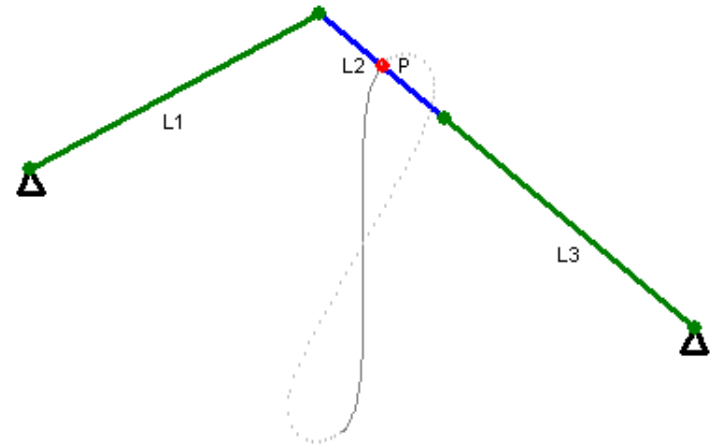
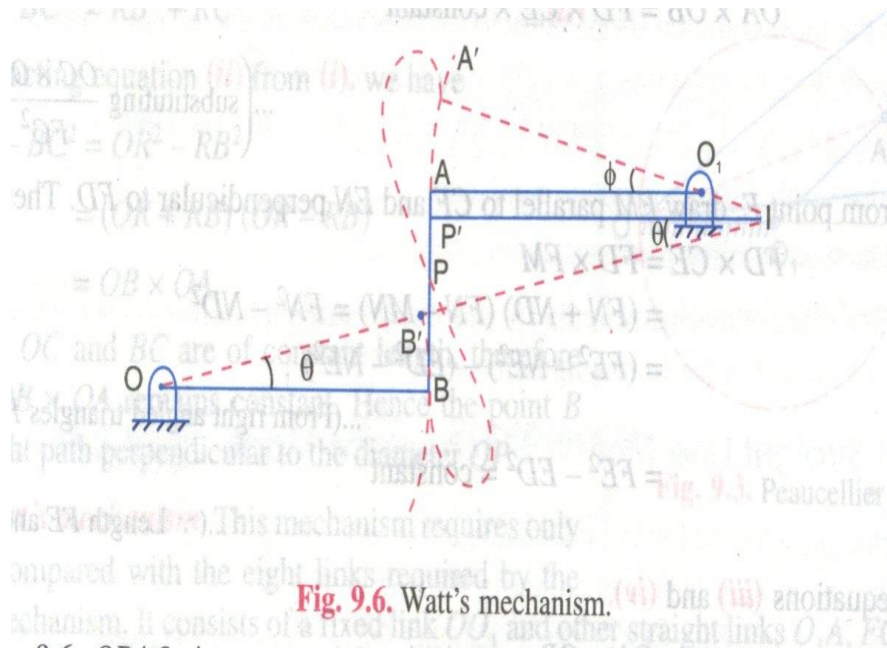
PEAUCELLIER MECHANISM



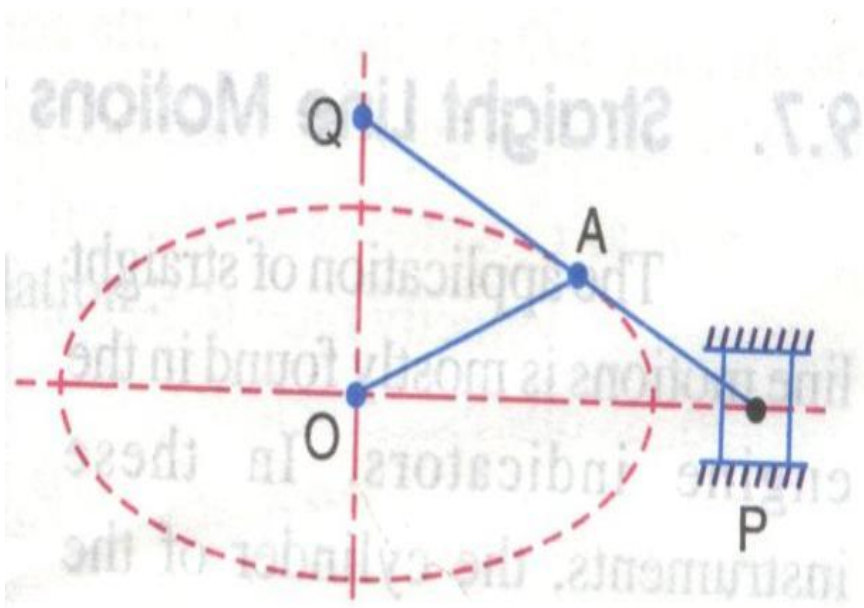
HART'S MECHANISM



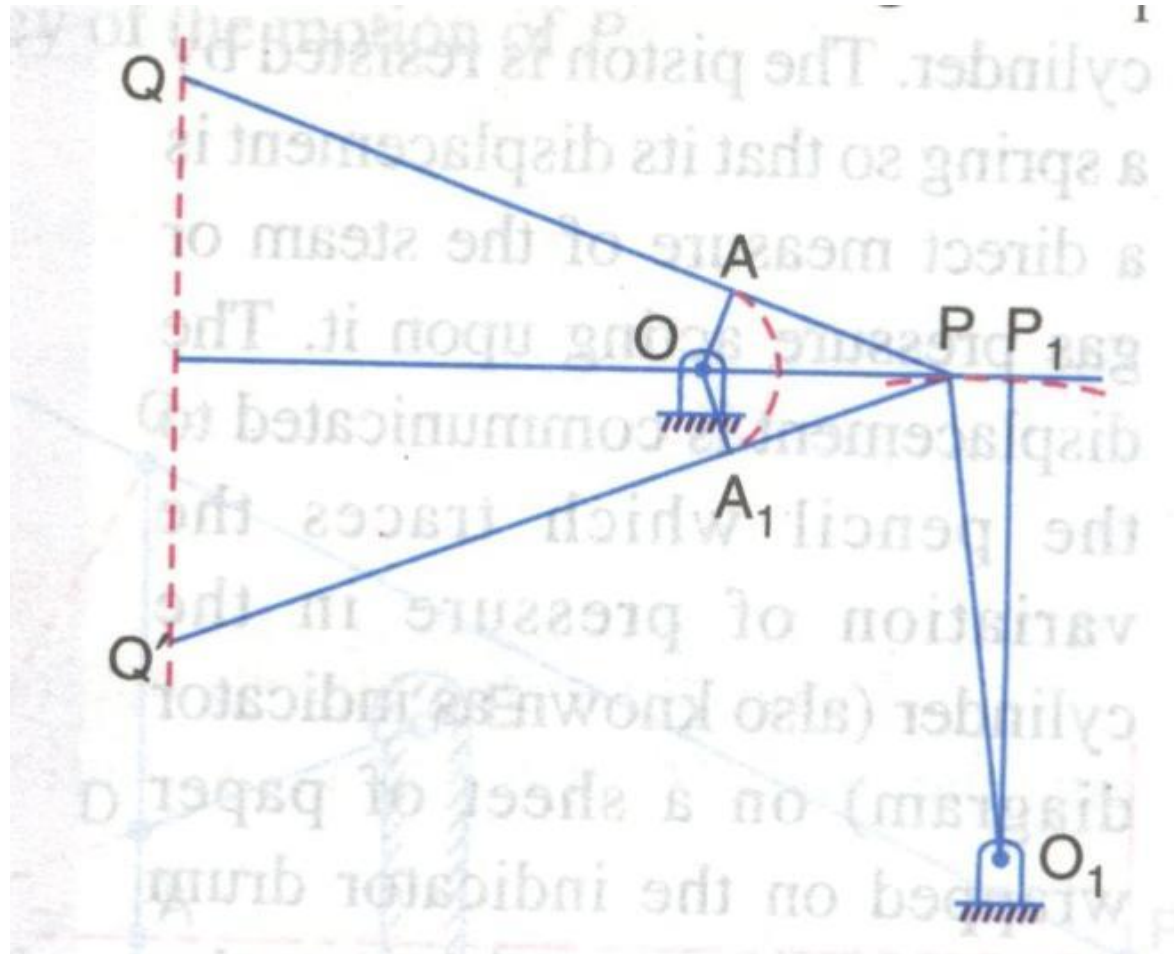
WATT'S MECHANISM



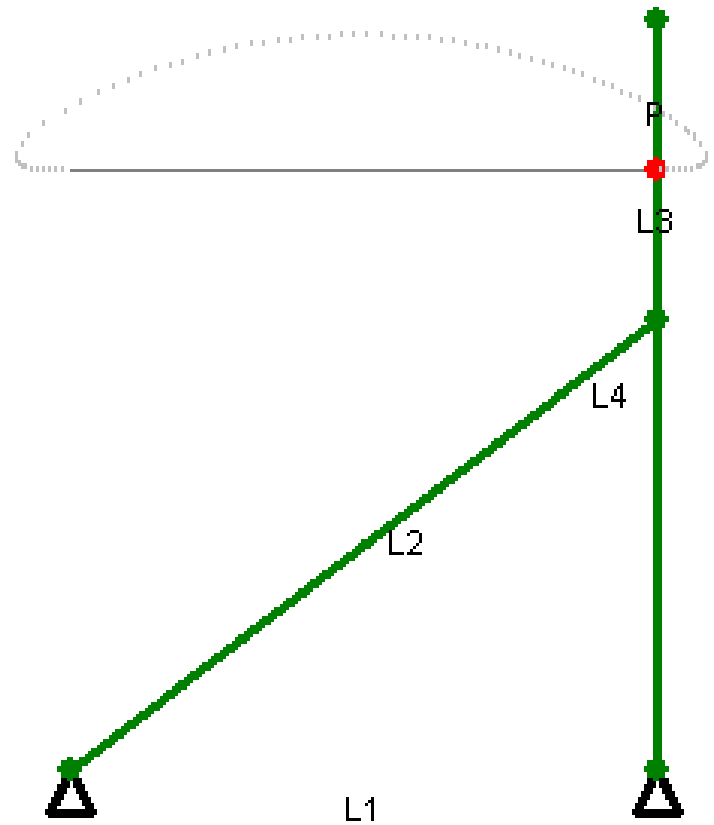
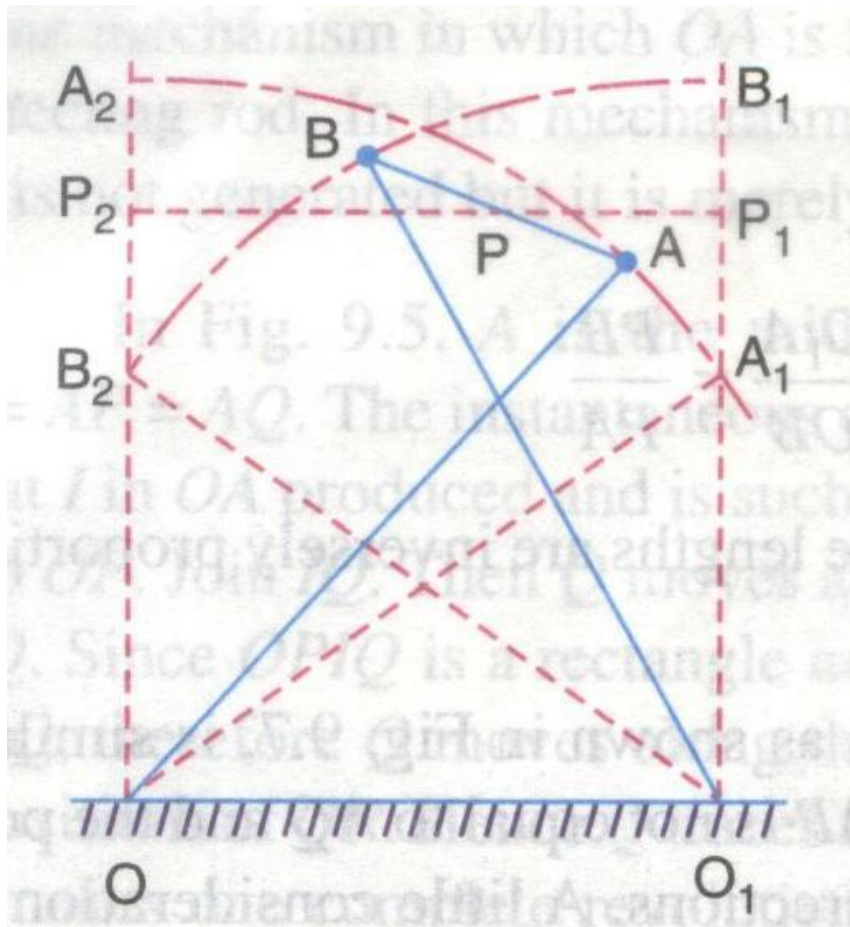
MODIFIED SCOTCH RUSSEL MECHANISM



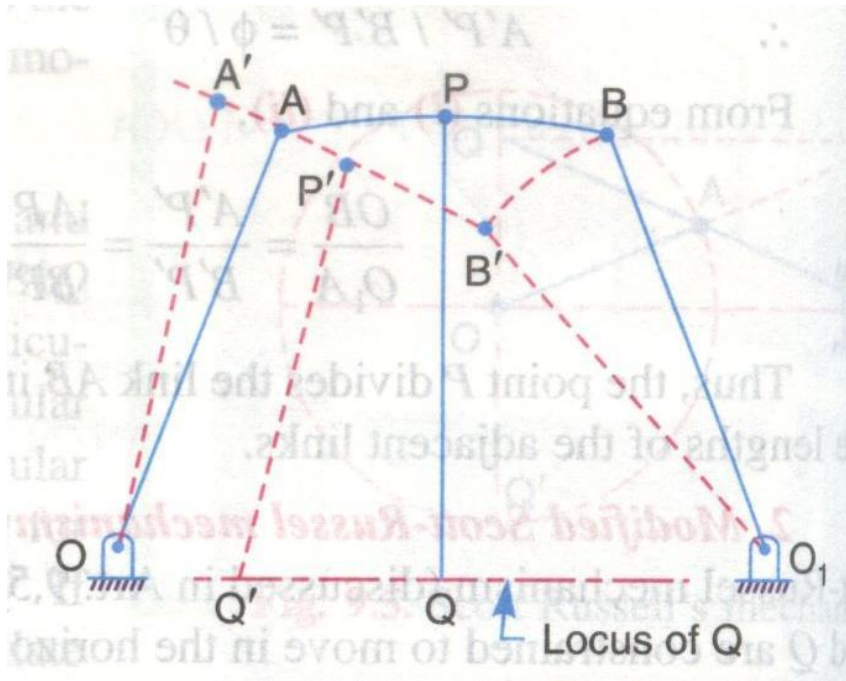
GRASSHOPPER MECHANISM



TCHEBICHEF MECHANISM

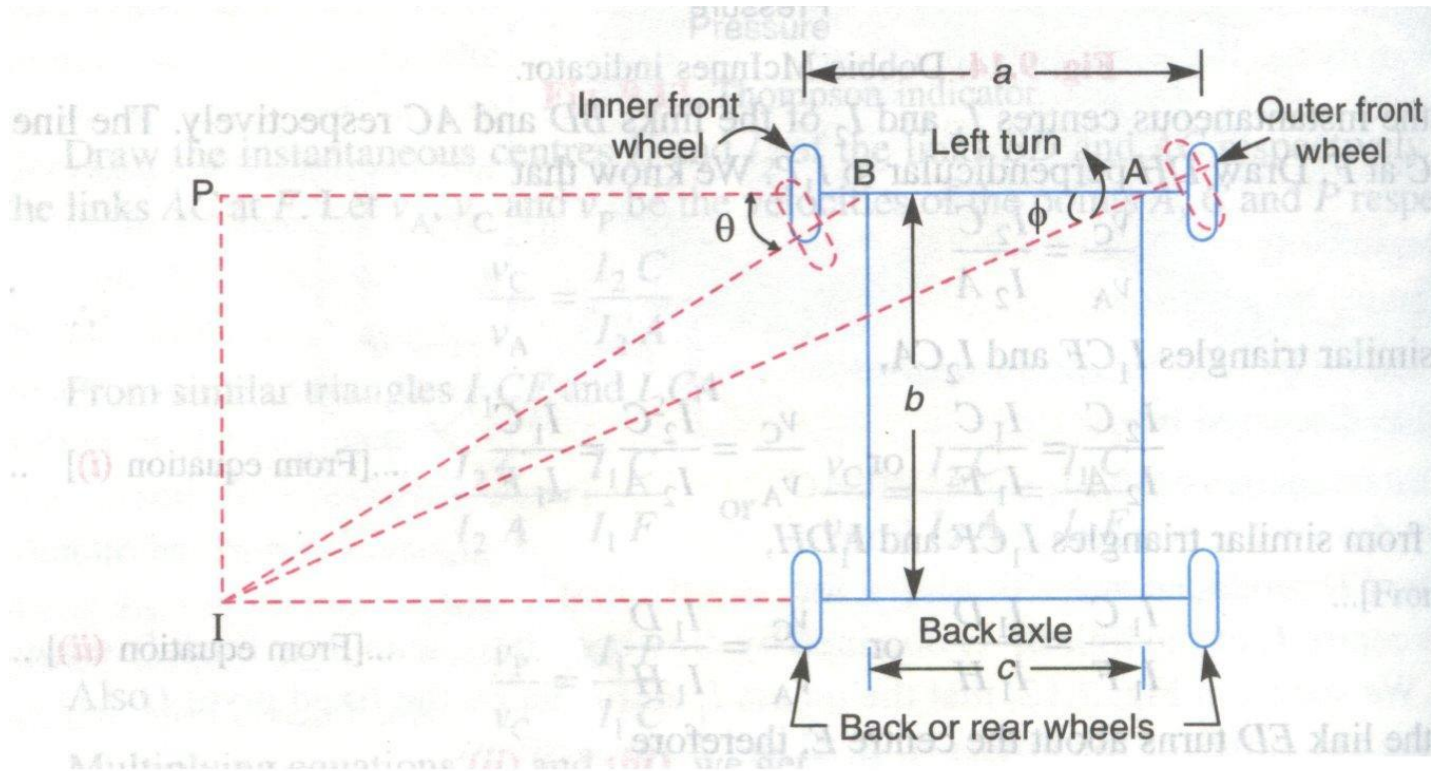


ROBERTS MECHANISM



STEERING GEAR MECHANISMS

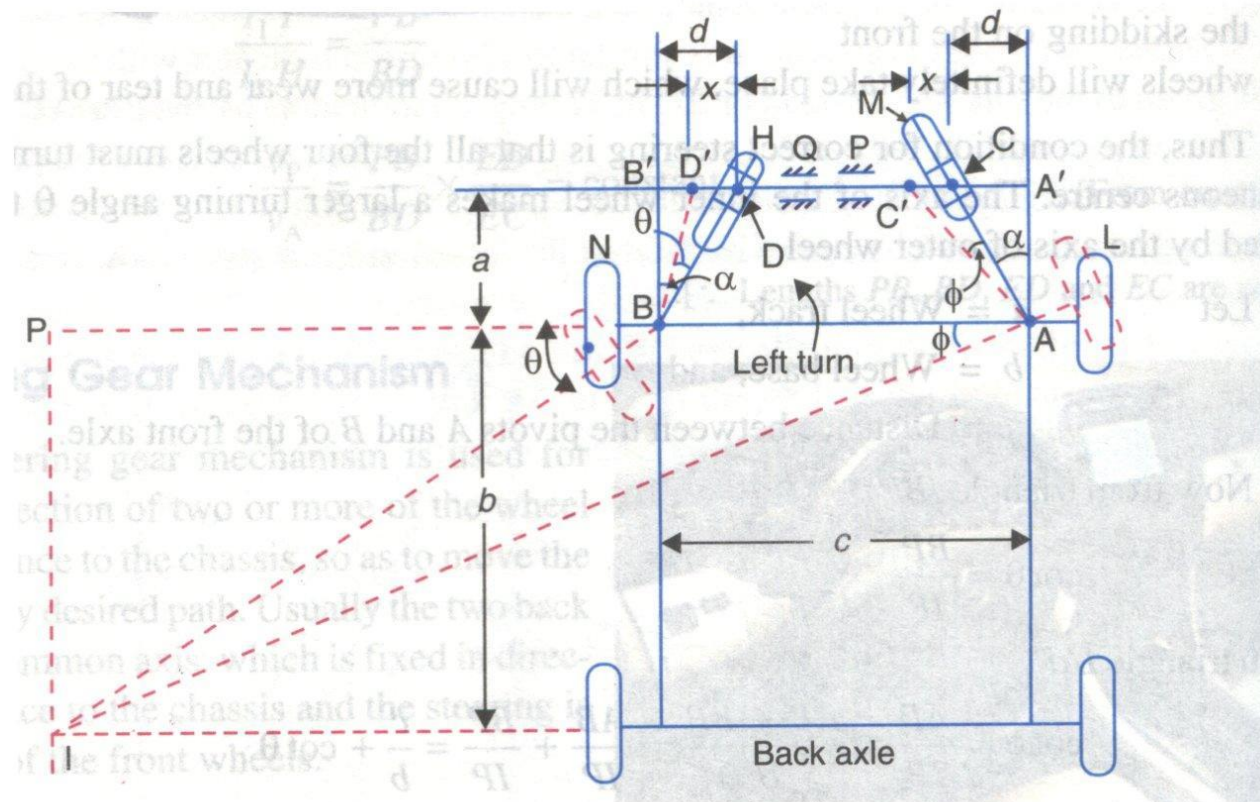
CONCEPT OF CORRECT STEERING



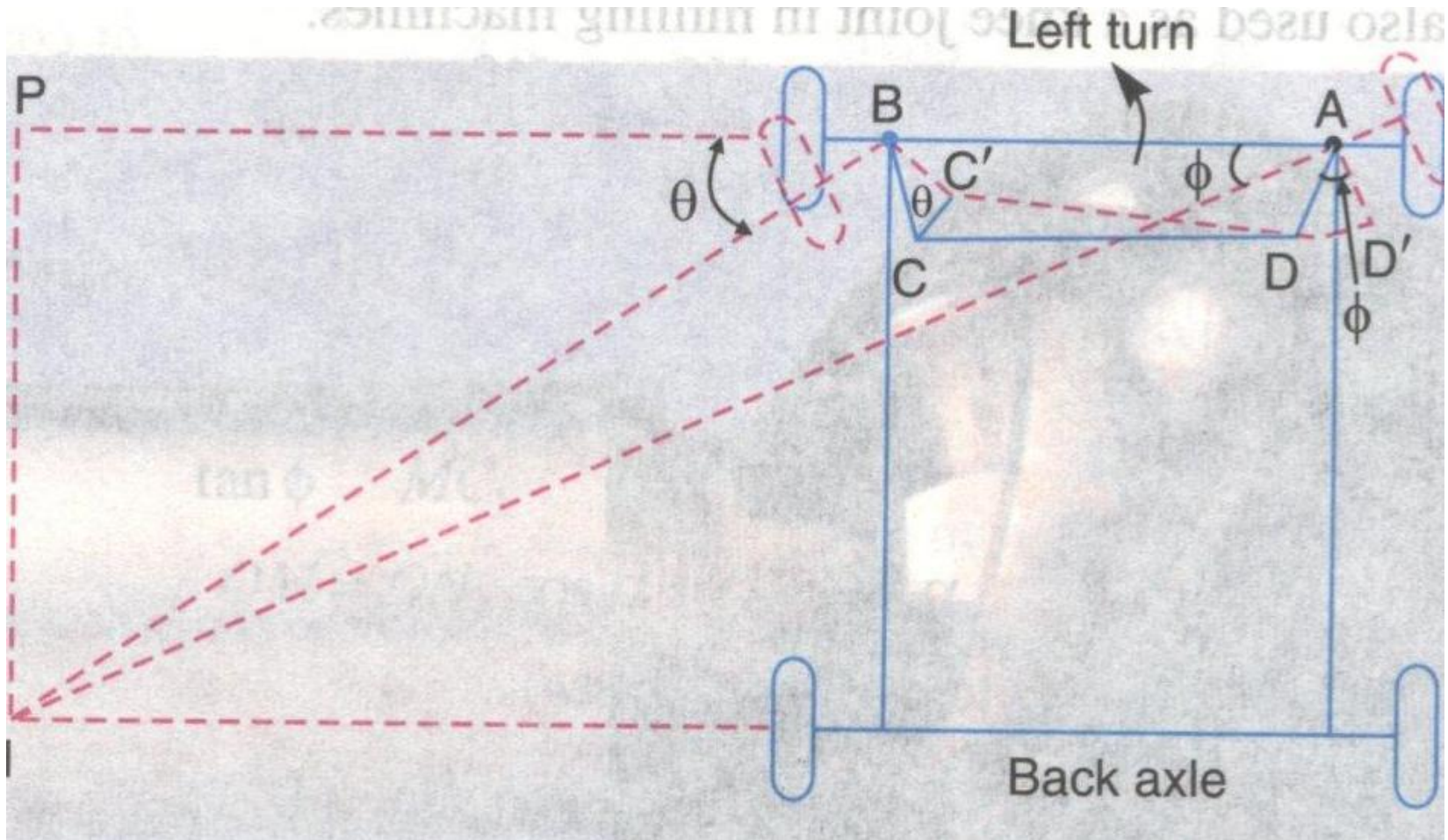
TYPES OF STEERING GEAR MECHANISMS

- DAVIS STEERING GEAR MECHANISM
- ACKERMAN STEERING GEAR MECHANISM

DAVIS STEERING GEAR MECHANISM



ACKERMAN STEERING GEAR MECHANISM



THANK YOU

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