



# **SNS COLLEGE OF TECHNOLOGY**

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**Department of Mechanical Engineering**  
**19MET302 - THEORY OF MACHINES**

**Unit – I**  
**BASICS OF MECHANISMS**

**TOPIC - 5**

**DOUBLE SLIDER CRANK CHAIN(DSCC)**

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S/MECH/SNSCT**



## DOUBLE SLIDER CRANK CHAIN

1. Elliptical trammels.
2. Scotch yoke mechanism.
3. Oldham's coupling.

**Internship: BULL MACHINES.**



SOURCE: HY-MAC



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## ELLIPTICAL TRAMMELS

- It is an instrument used for drawing ellipses. This inversion is obtained by fixing the slotted plate (link 4), as **shown in next slide Figure.**
- The fixed plate or link 4 has two straight grooves cut in it, at right angles to each other.
- The link 1 and link 3, are known as sliders and form sliding pairs with link 4. The link AB (link 2) is a bar which forms turning pair with links 1 and 3.

*BOARD USAGE ALSO*

**BULL ENGINE**

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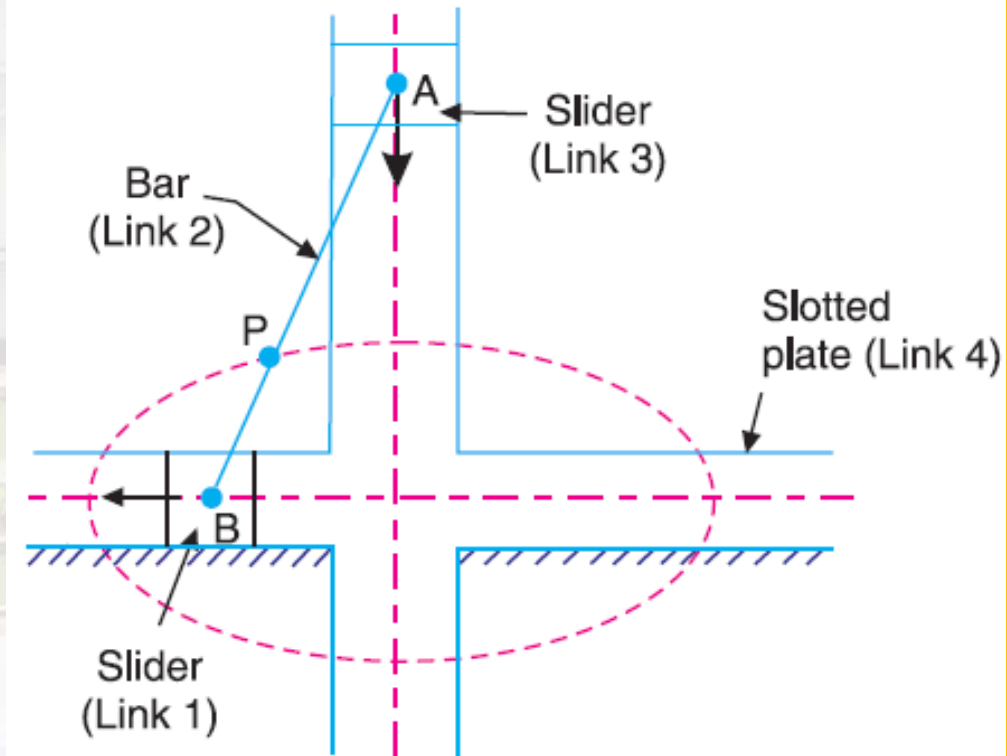
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## ELLIPTICAL TRAMMELS

SOURCE: Khurmi R S

- When the links 1 and 3 slide along their respective grooves, any point on the link 2 such as P traces out an ellipse on the surface of link 4, as shown in Figure.



## ELLIPTICAL TRAMMELS

*BOARD USAGE ALSO*

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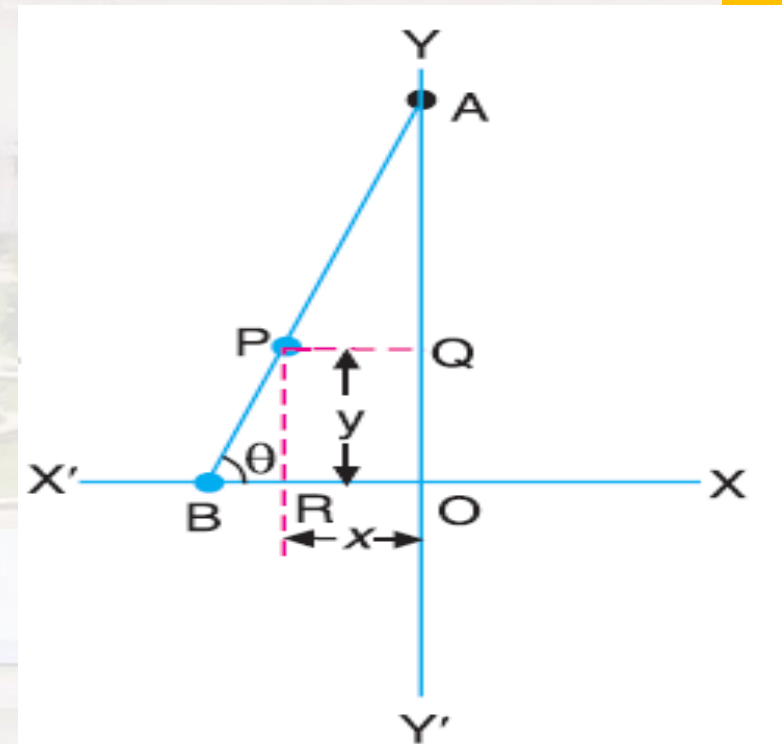


## ELLIPTICAL TRAMMELS

$$x = PQ = AP \cos \theta ; \text{ and } y = PR = BP \sin \theta$$

$$x^2 + y^2 = (AP)^2$$

*BOARD USAGE ALSO*



SOURCE: Khurmi R S



# ROTARY INTERNAL COMBUSTION ENGINE OR GNOME ENGINE

- Sometimes back, rotary internal combustion engines were used in aviation.
- But now-a-days gas turbines are used in its place.



SOURCE: Khurmi R S

*BOARD USAGE ALSO*

**ROTARY ENGINE**

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# **CRANK AND SLOTTED LEVER QUICK RETURN** **MOTION MECHANISM**

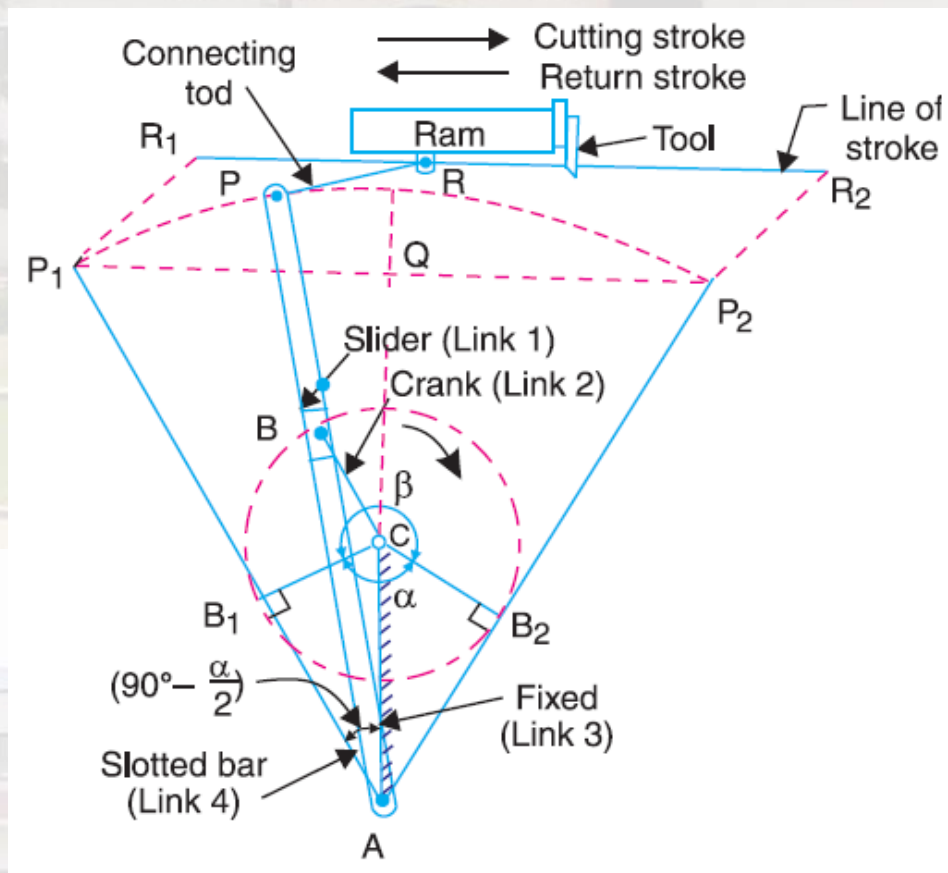
- This mechanism is mostly used in shaping machines, slotting machines and in rotary internal combustion engines.
- The link 3 corresponds to the connecting rod of a reciprocating steam engine. The driving crank CB revolves with uniform angular speed about the fixed centre C.

*BOARD USAGE ALSO*



# CRANK AND SLOTTED LEVER QUICK RETURN

## MOTION MECHANISM



SOURCE: Khurmi R S





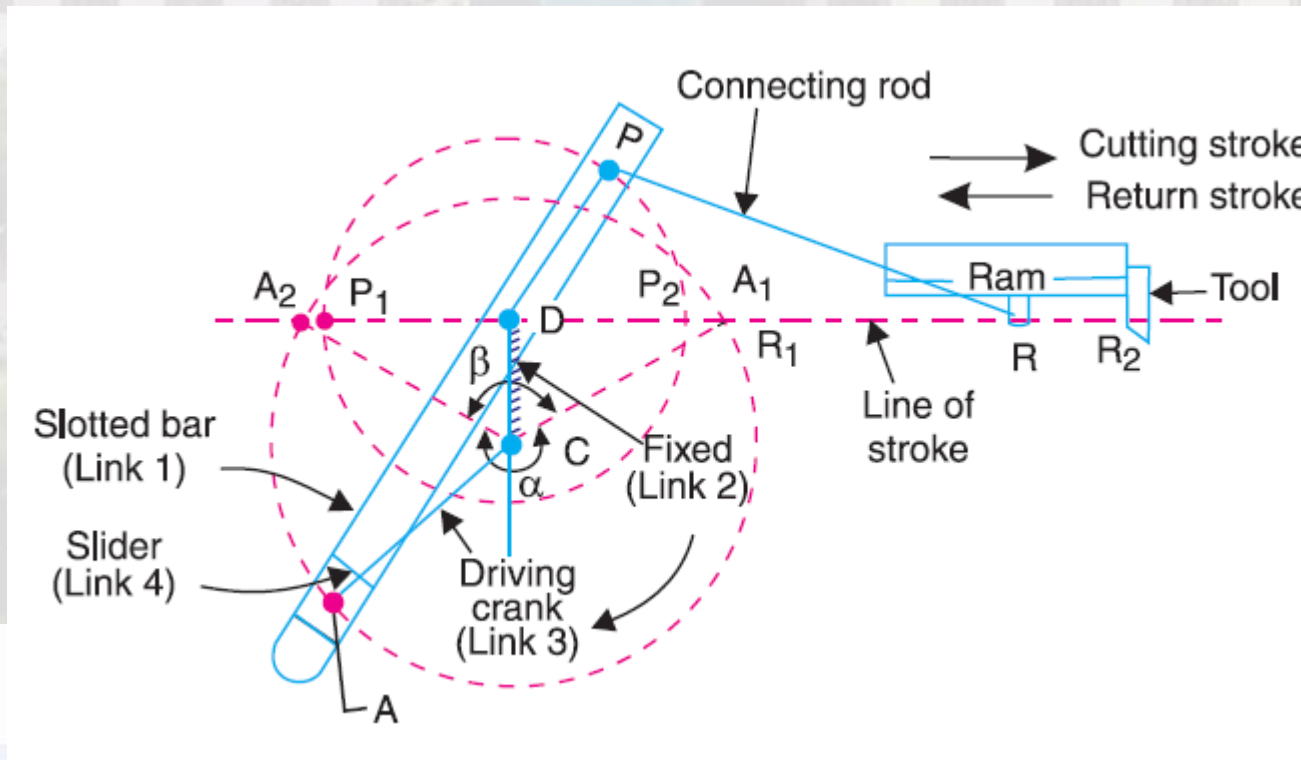
# WHITWORTH QUICK RETURN MOTION MECHANISM

- This mechanism is mostly used in shaping and slotting machines.
- The link 2 corresponds to a crank in a reciprocating steam engine.
- The driving crank CA (link 3) rotates at a uniform angular speed.
- The slider (link 4) attached to the crank pin at A slides along the slotted bar PA (link 1) which oscillates at a pivoted point D.
- The connecting rod PR carries the ram at R to which a cutting tool is fixed.

*BOARD USAGE ALSO*



# WHITWORTH QUICK RETURN MOTION MECHANISM



SOURCE: Khurmi R S

*BOARD USAGE ALSO*

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## SINGLE SLIDER CRANK CHAIN

### ASSESSMENT QUESTION

1. Show that slider crank mechanism is a modification of the basic four bar mechanism.
2. Sketch slider crank chain and its various inversions, stating actual machines in which these are used in practice.



## SINGLE SLIDER CRANK CHAIN

### ASSESSMENT QUESTION

1. Which of the following is an inversion of single slider crank chain ?  
(a) Beam engine            (b) Watt's indicator mechanism  
(c) Elliptical trammels    (d) Whitworth quick return motion mechanism
2. The mechanism forms a structure, when the number of degrees of freedom (n) is equal to  
(a) 0    (b) 1    (c) 2    (d) – 1



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*Thank  
you!*

SOURCE: WEB