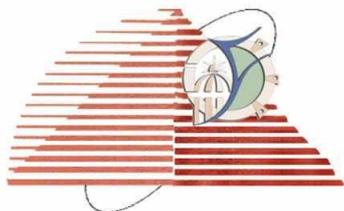


بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

# Construction Equipments



**Fayoum University**



**Faculty of Engineering  
Mechanical Engineering Dept.**

*Lecture (1)*

*on*

# *Theory and Fundamental of Machine Working*

*By*

***Dr. Emad M. Saad***

*Mechanical Engineering Dept.*

*Faculty of Engineering*

*Fayoum University*

**2015 - 2016**



# Contact Information

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	<b>Office Hours:</b>	Tuesday: 10:00 - 15:30 Wednesday: 09:00 - 15:30 or by Appointment





# Construction Machines Classification

4

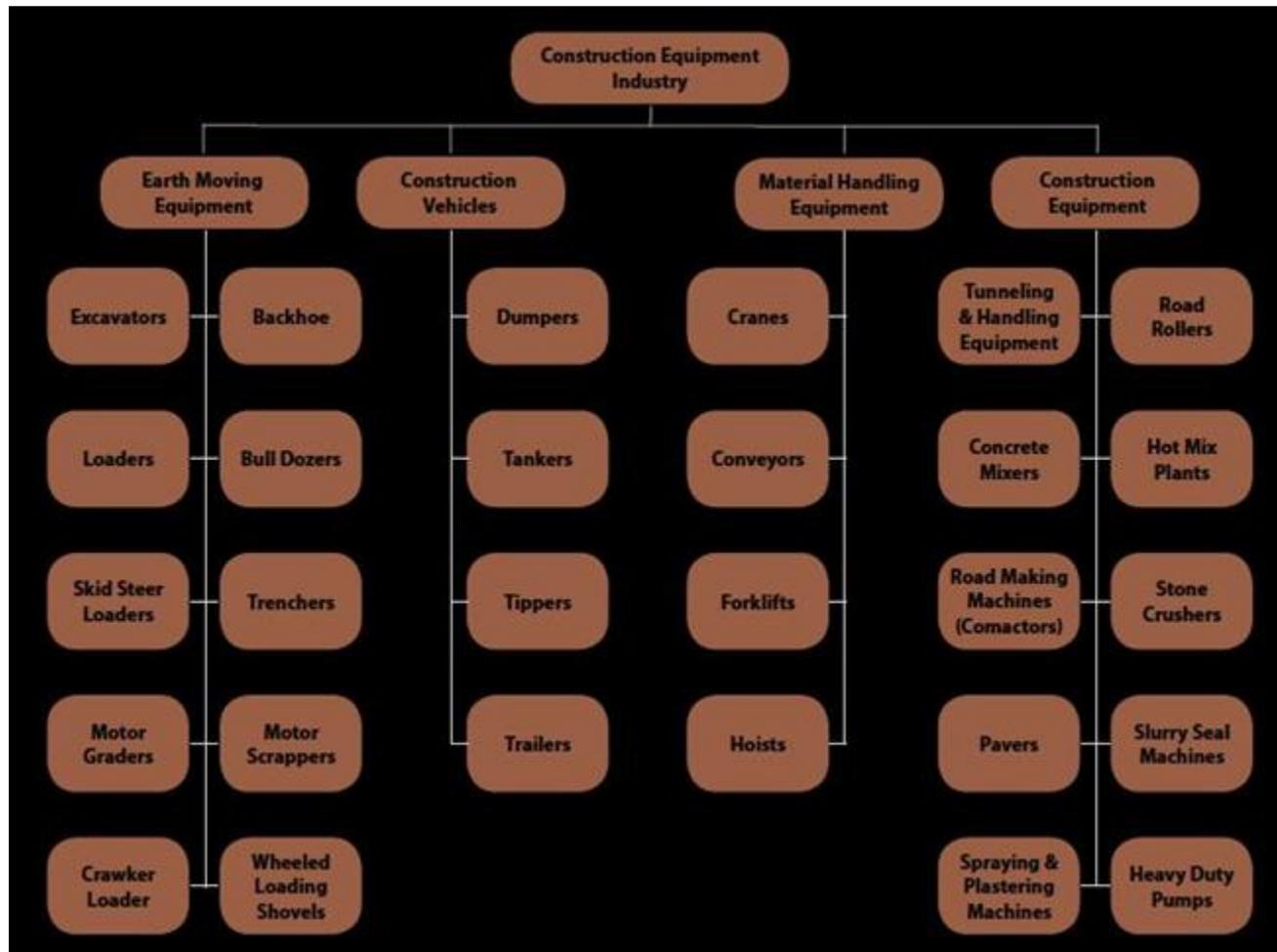
- It is a common fact that we find a wide variety of construction machines on every construction sites, which make the construction jobs easy, safe and quicker.
  
  - Depending on the application, construction machines are classified into various categories which we are discussing here.
1. Earthmoving equipments
  2. Construction vehicles
  3. Material handling equipments
  4. Construction equipments





# Construction Machines Classification

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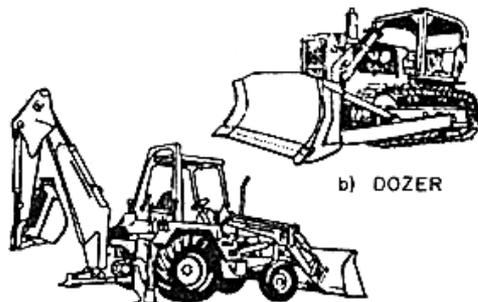


# Construction Machines Classification

6



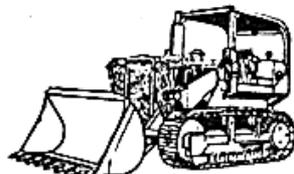
a) PAY LOADER



b) DOZER



c) BACKHOE



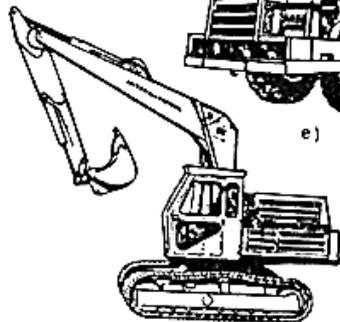
d) PAY LOADER



e) SCRAPER



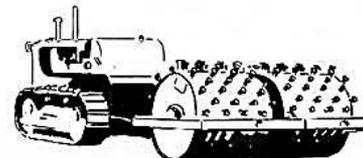
f) LOGGING EQUIPMENT



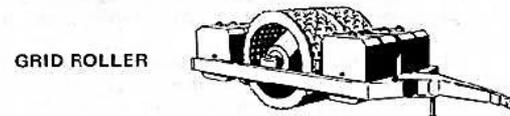
g) HYDRAULIC EXCAVATOR



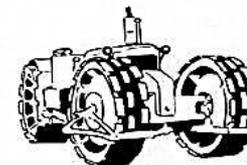
h) PAY HAULER



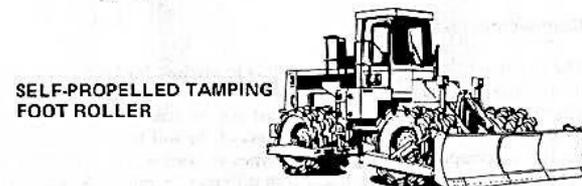
TOWED SHEEPSFOOT ROLLER



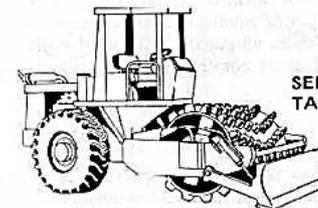
GRID ROLLER



SELF-PROPELLED SEGMENTED STEEL WHEEL ROLLER



SELF-PROPELLED TAMPING FOOT ROLLER



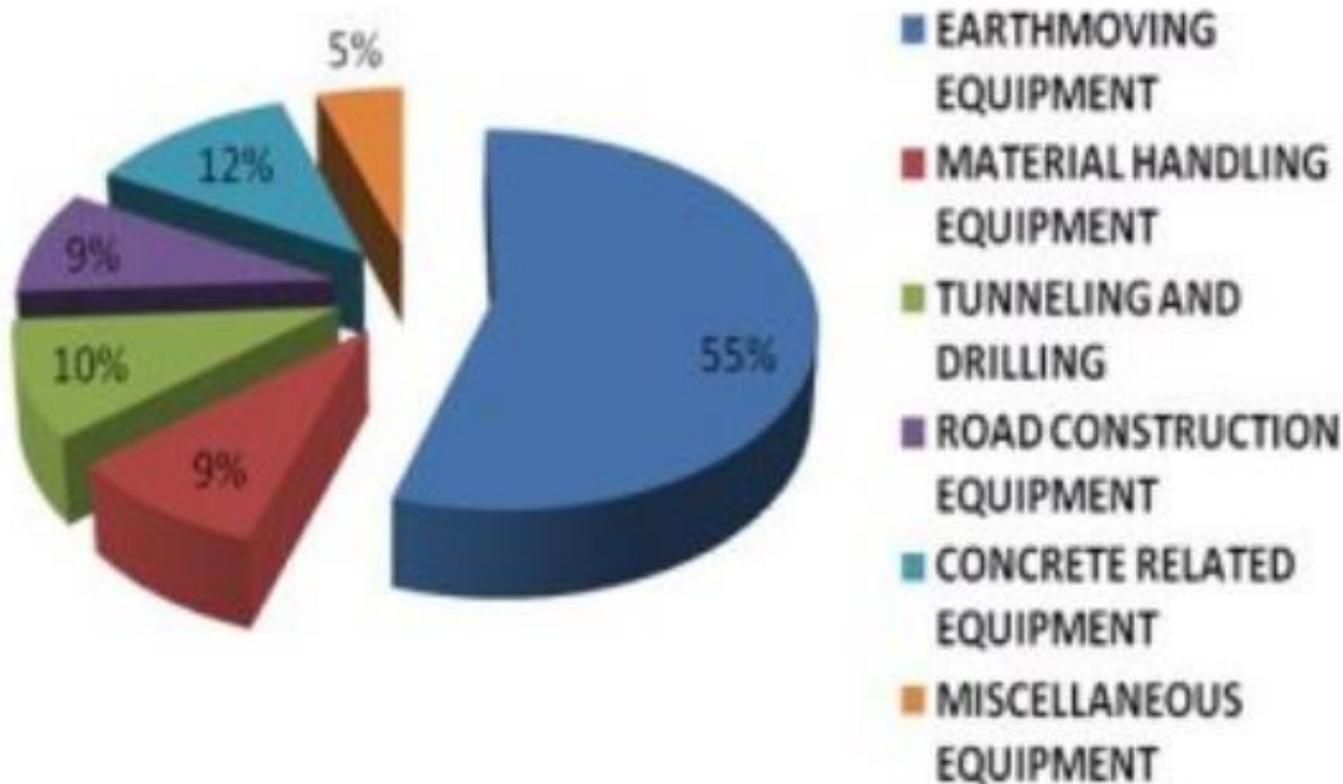
SELF-PROPELLED VIBRATORY TAMPING FOOT ROLLER





# Construction Machines Classification

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# Development of Construction Machine

8

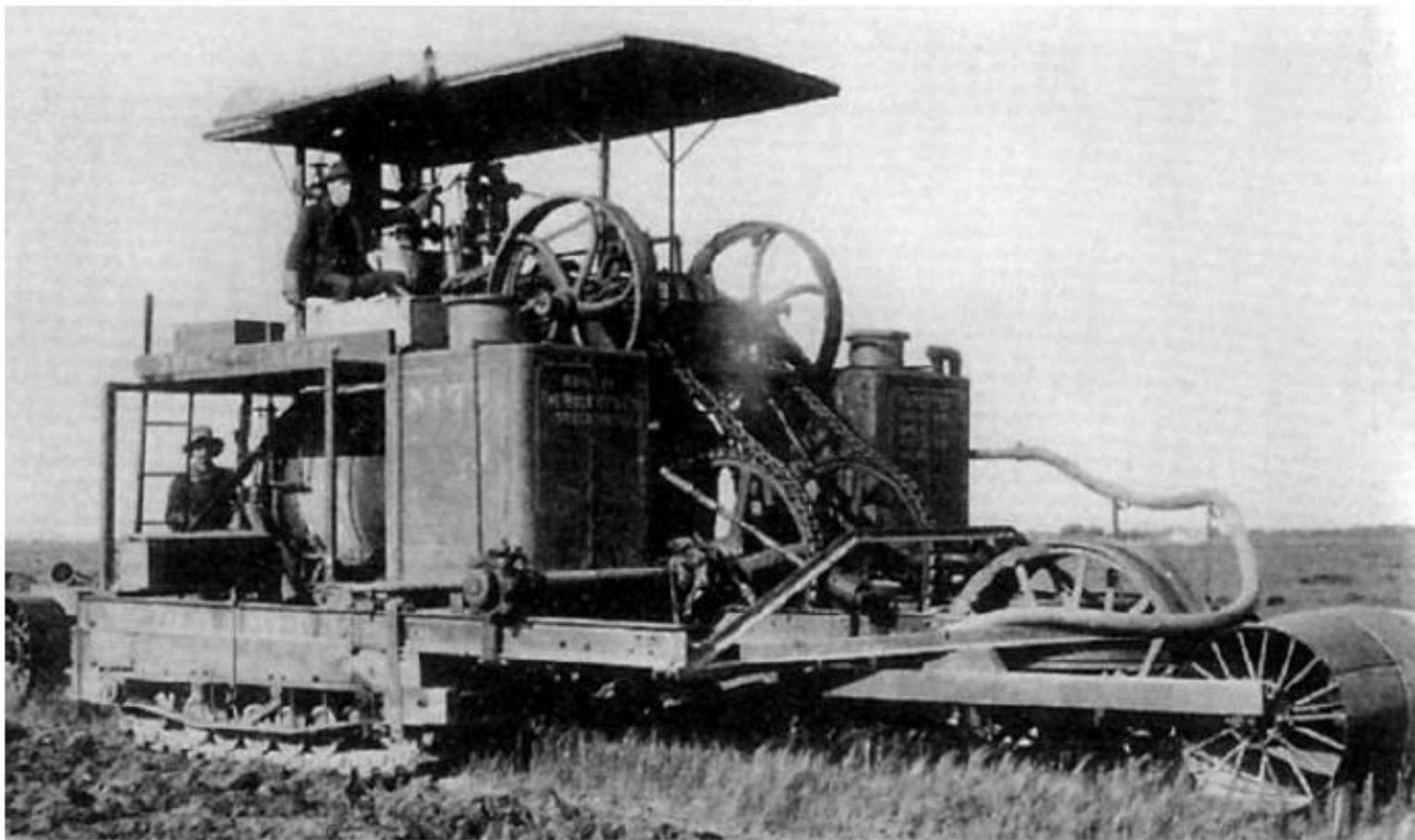






# Development of Construction Machine

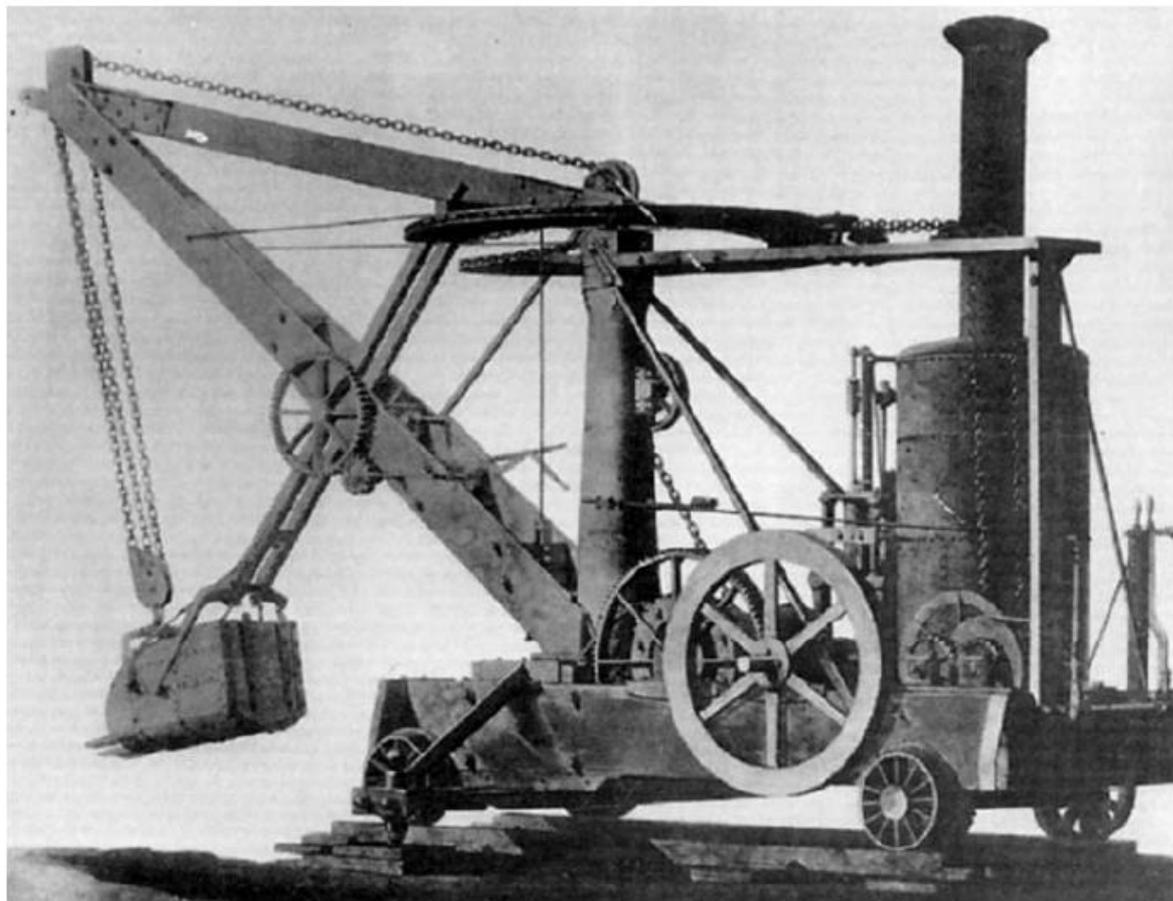
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# Development of Construction Machine

10





# Theory of Machine Working

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**Modern Times is a 1936**



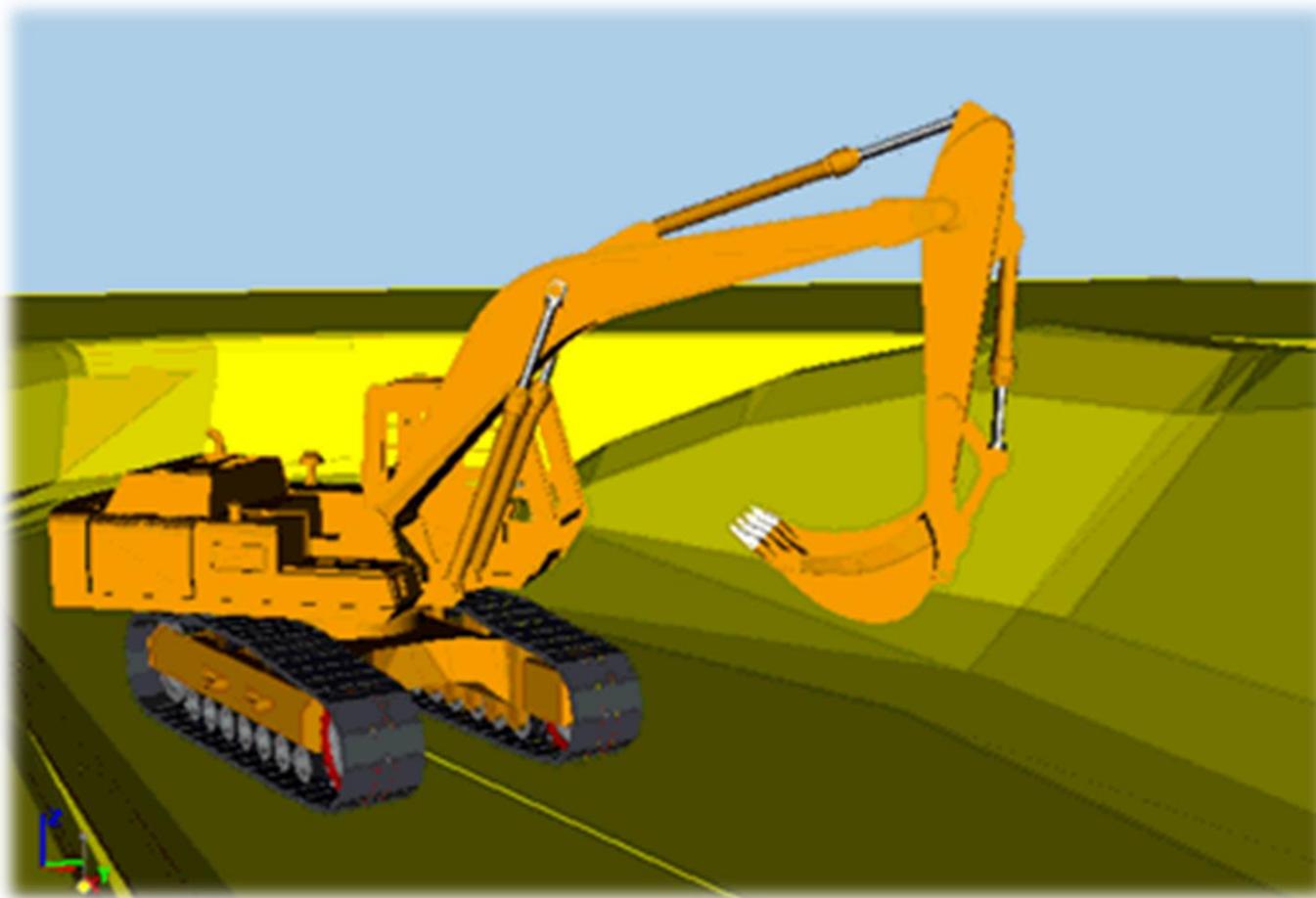
"Modern Times"





# Theory of Machine Working

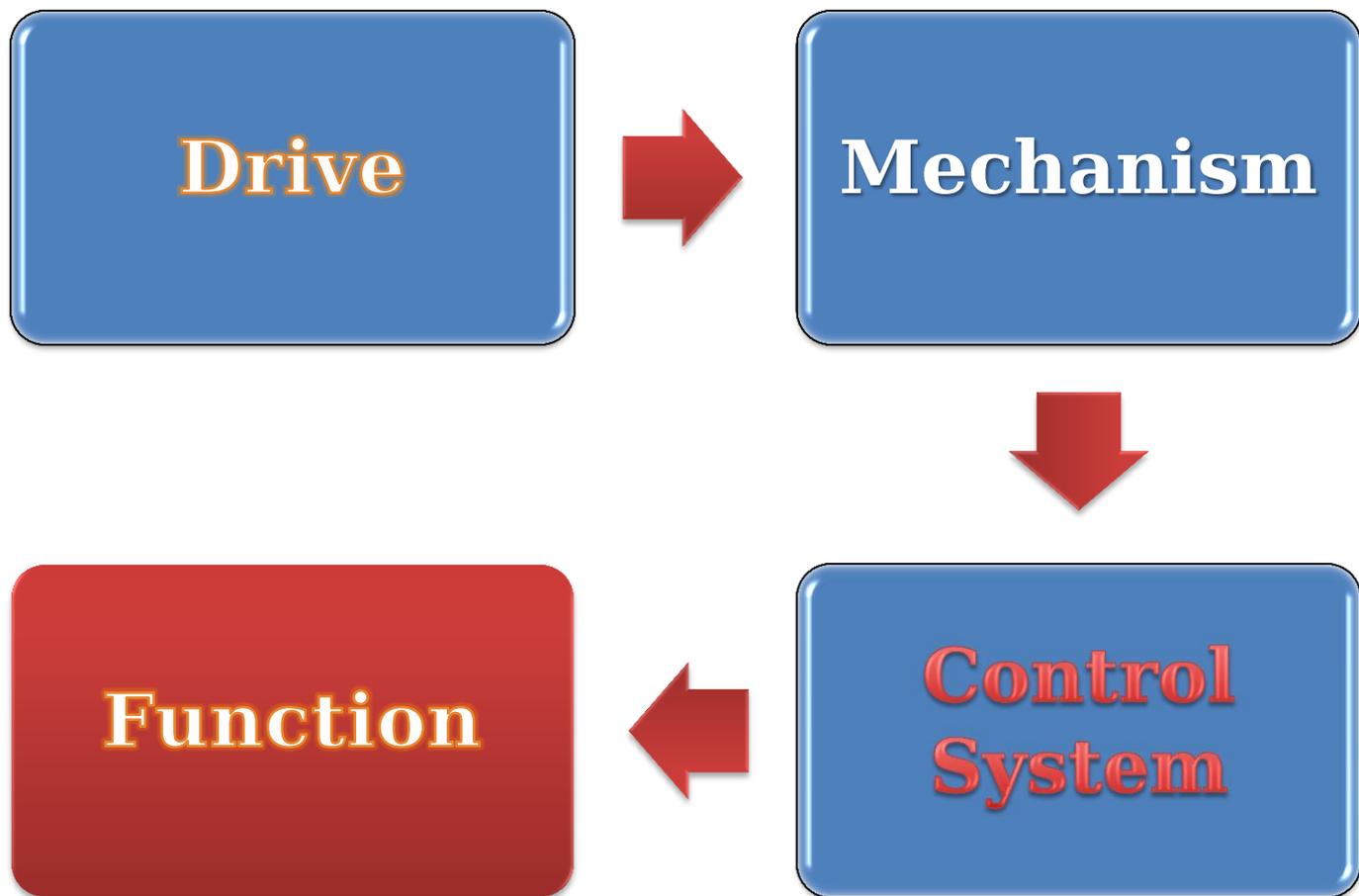
12





# Mechanical System Components

13





# Mechanical System Components

14

## Drive or power source

**Drive is a power source in mechanical system and its types are:**

- 1. Human and animal power**
- 2. Mechanical power (hydraulic, pneumatic, diesel engine, .....)**
- 3. Electrical power**
- 4. Natural power such as wind and water**





# Theory of Machine Working

15

## **Mechanism**

**A mechanism is a device designed to transform input forces and movement into a desired set of output forces and the movement.**

**Mechanisms generally consist of moving components** such as gears and gear trains, belt and chain drives, cam and follower mechanisms, and **linkages** as well as friction devices such as brakes and clutches, and **structural components** such as the frame, fasteners, bearings, springs, lubricants and seals, as well as a variety of specialized machine elements such as splines, pins and keys.





# Theory of Machine Working

16

## **Mechanism**

**There are four basic types of motion in mechanical systems:**

- 1. Rotary motion** is turning round in a circle, such as a wheel turning.
- 2. Linear motion** is moving in a straight line, such as on a paper trimmer.
- 3. Reciprocating motion** is moving backwards and forwards in a straight line, as in cutting with a saw.
- 4. Oscillating motion** is swinging from side to side, like a pendulum in a clock.

**Many mechanisms take one type of input motion, and output it as a different type of motion.**







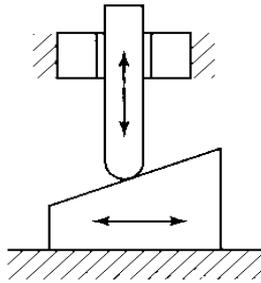
# Theory of Machine Working

17

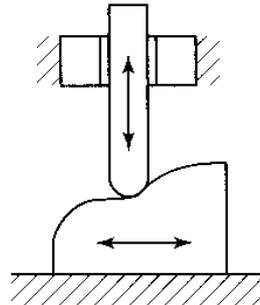
## Mechanism

### *Translation to Translation*

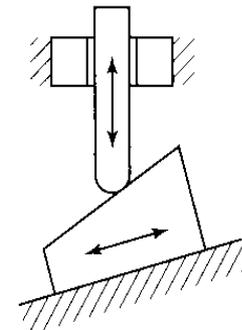
Wedge Cam Follower:  
(Perpendicular)



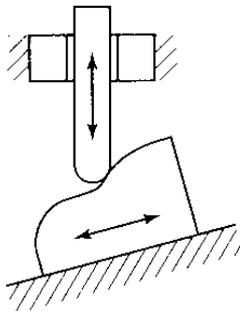
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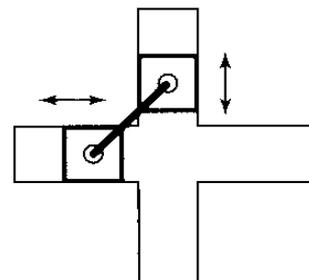
Wedge Cam Follower:  
(Skew)



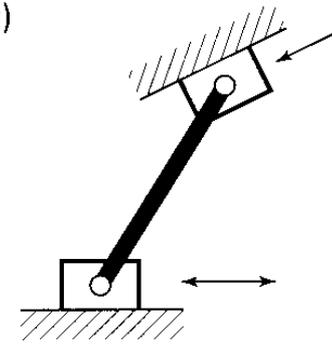
Wedge Cam Follower:  
(Skew)



Double-slider:  
(Perpendicular)



Double-slider:  
(Skew)



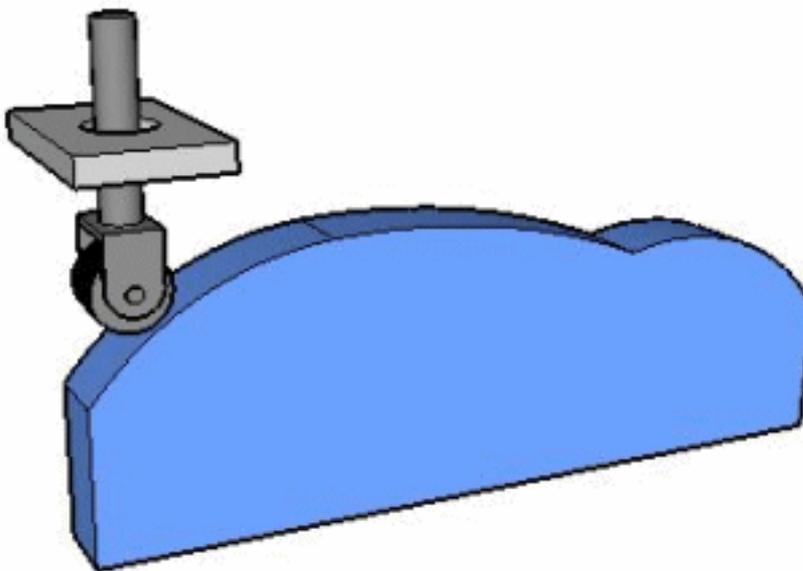


# Theory of Machine Working

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## **Mechanism**

### *Translation to Translation*



By V.Ryan



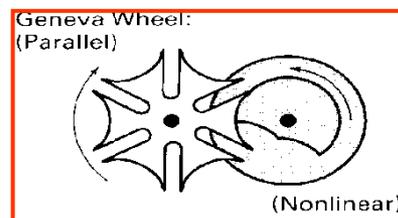
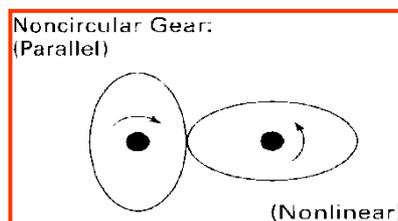
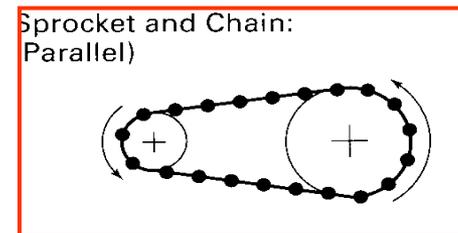
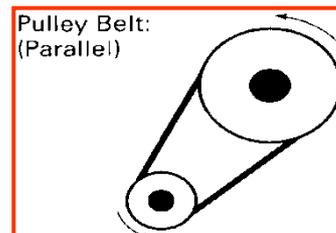
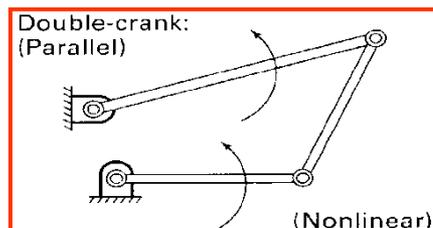
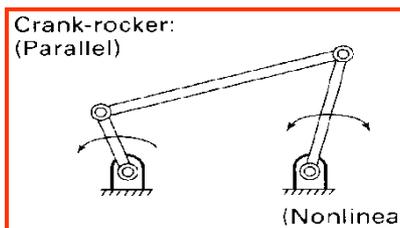
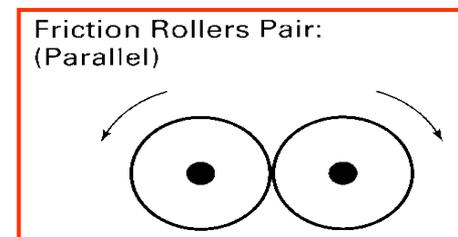
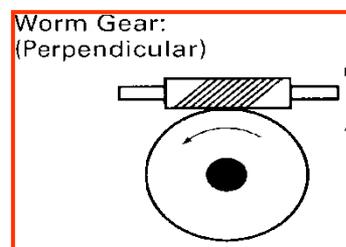
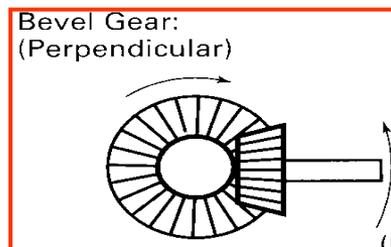
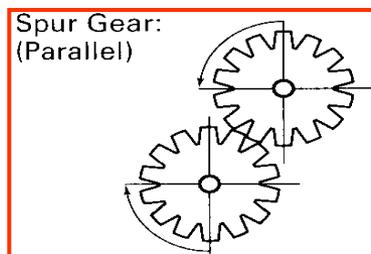


# Theory of Machine Working

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## Mechanism

### *Rotational to Rotational*



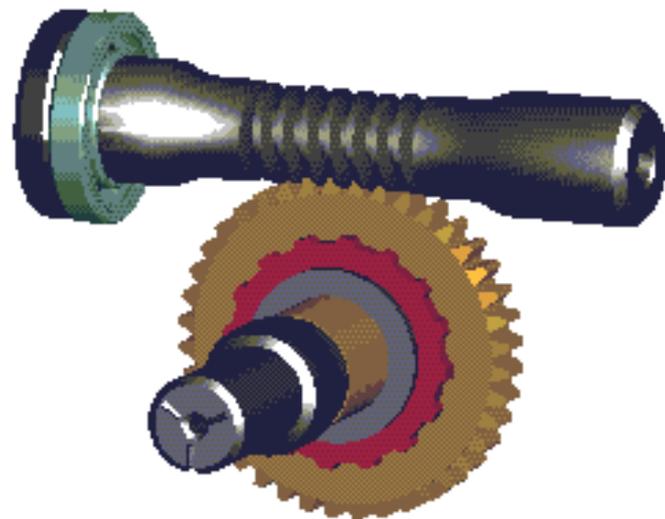
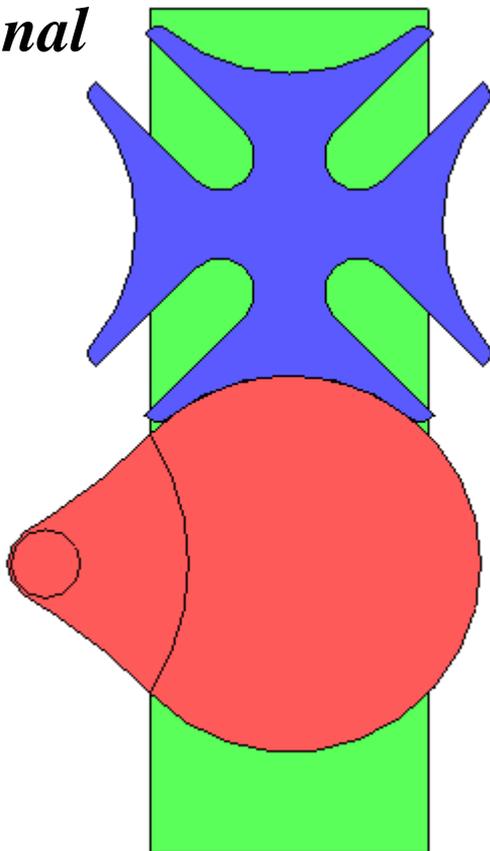
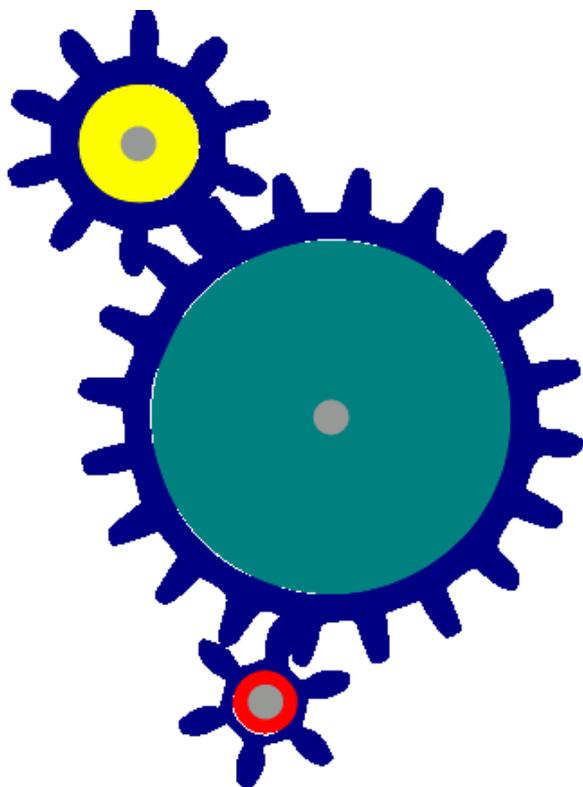


# Theory of Machine Working

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## Mechanism

*Rotational to Rotational*



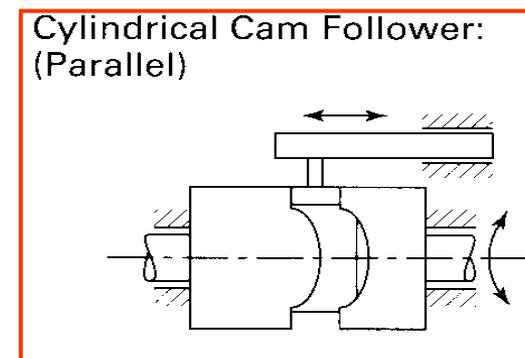
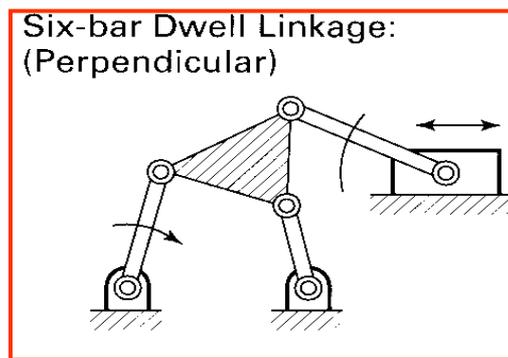
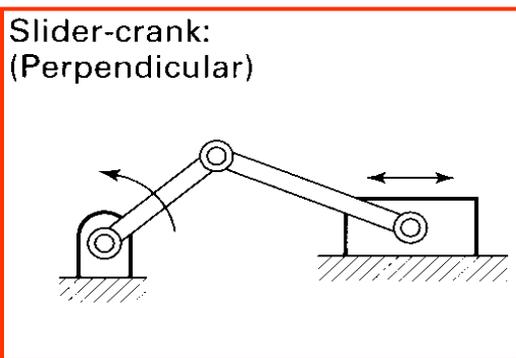
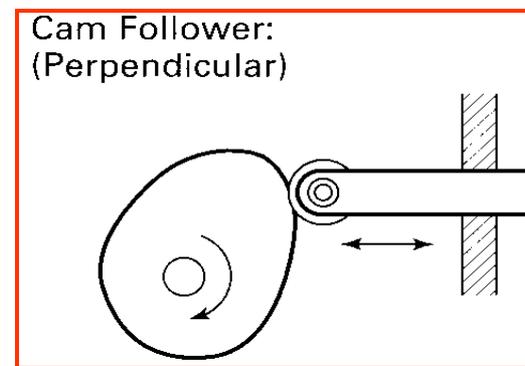
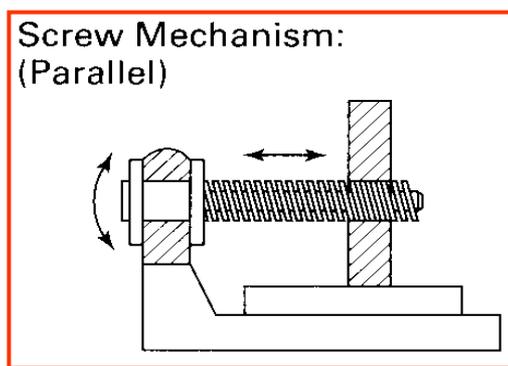
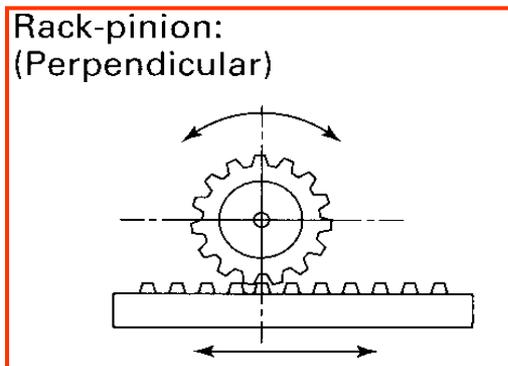


# Theory of Machine Working

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## Mechanism

### *Rotation to Translation*



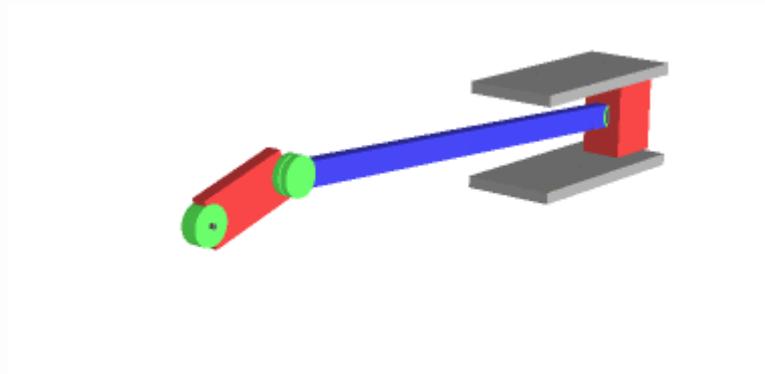
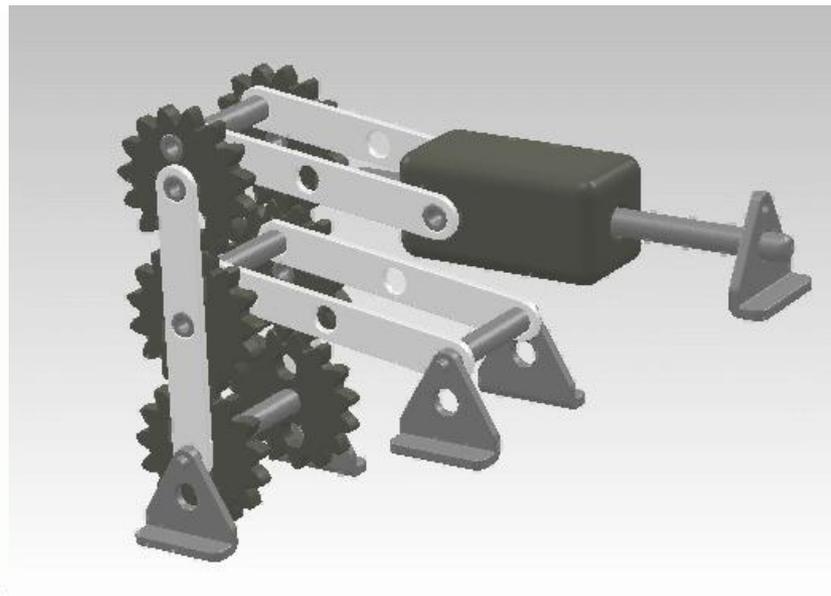
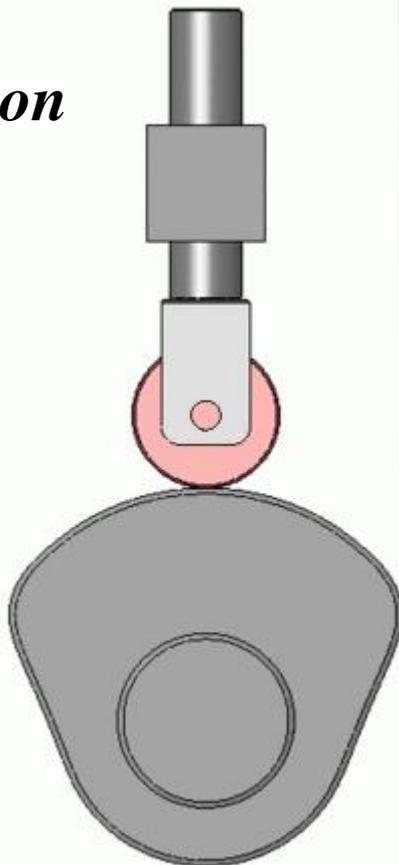
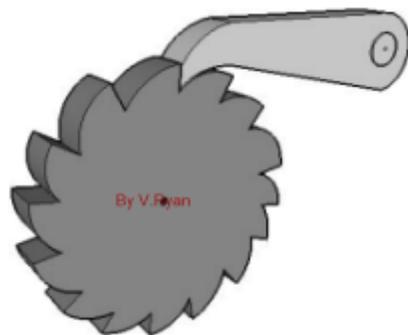
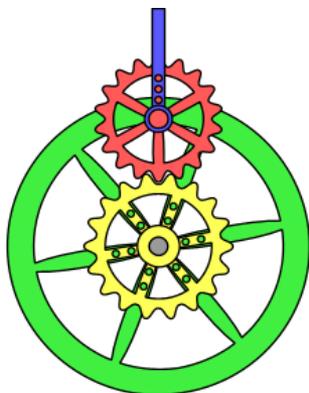


# Theory of Machine Working

22

## Mechanism

### *Rotation to Translation*

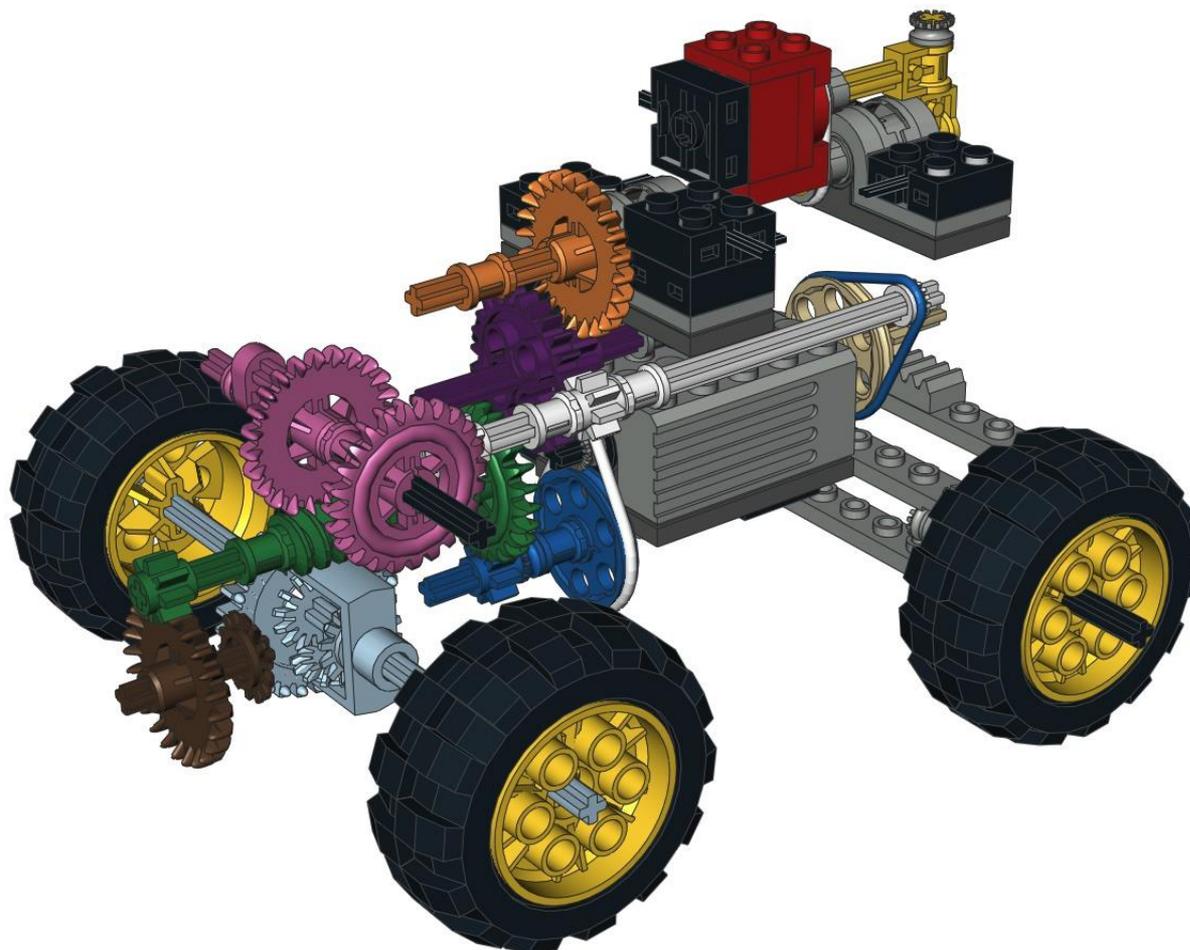




# Theory of Machine Working

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## Mechanism

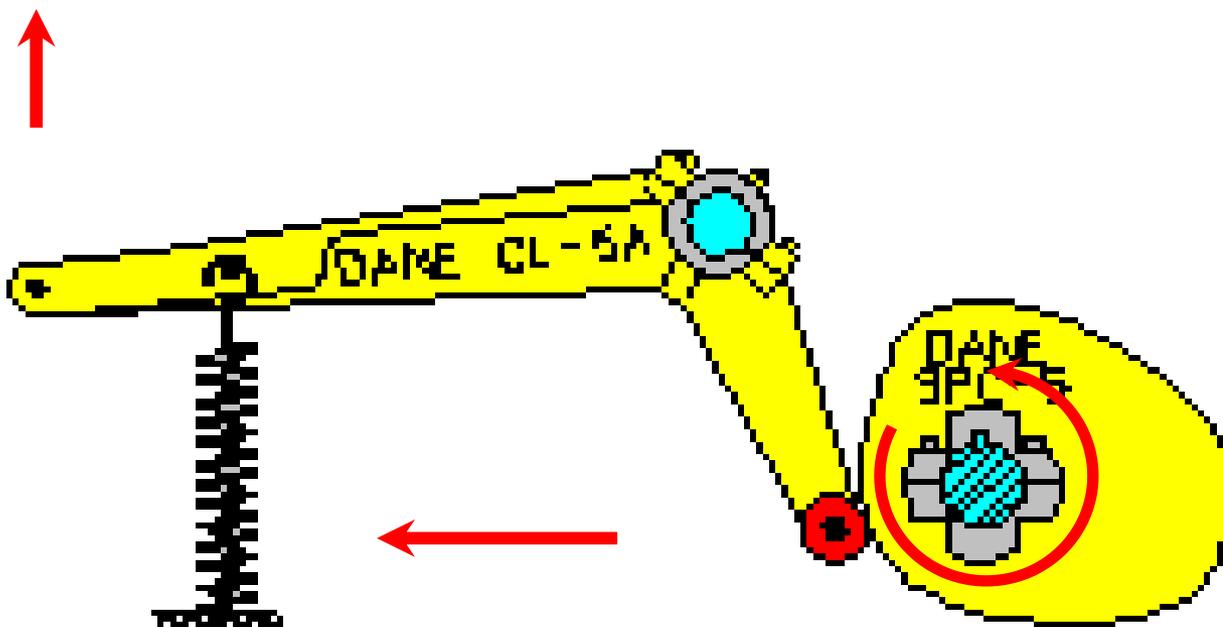




# Theory of Machine Working

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## Mechanism







# Theory of Machine Working

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## Mechanism

