Introduction to Railways

Railway engineering

- The branch of engineering that deals with planning,designing,construction and maintenance of railway tracks is called railway engineering.

Functions of railways

- Speedy development of area
- Speedy,safety and economical movement of people.
- Carrying raw materials and finished products in bulk
- Speedy movement of emergency services
- Helping people in famine affected areas etc by transporting food and other essentials on large scale

Merits over other modes

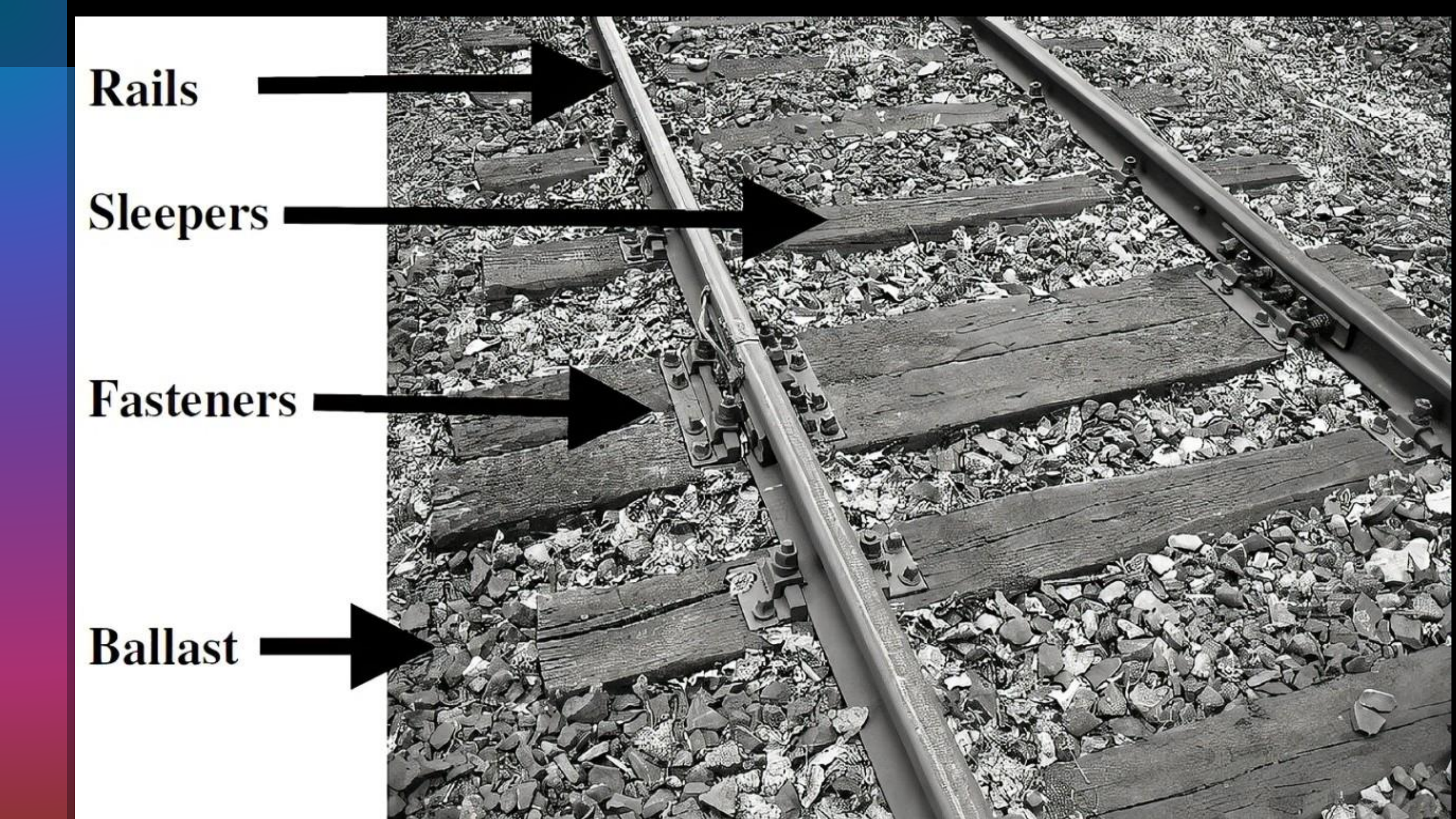
- Economical
- Less amount of power compared to their weight
- No steering is required
- Provide employment
- Source of revenue

Railway surveys

- Traffic survey
- Reconnaissance survey
- Preliminary survey
- Location survey

Components of a permanent way

- Rails
- Sleepers
- Ballast
- Sub ballast
- Subgrade


Rails
Sleepers
Fasteners
Ballast

Track Cross-section

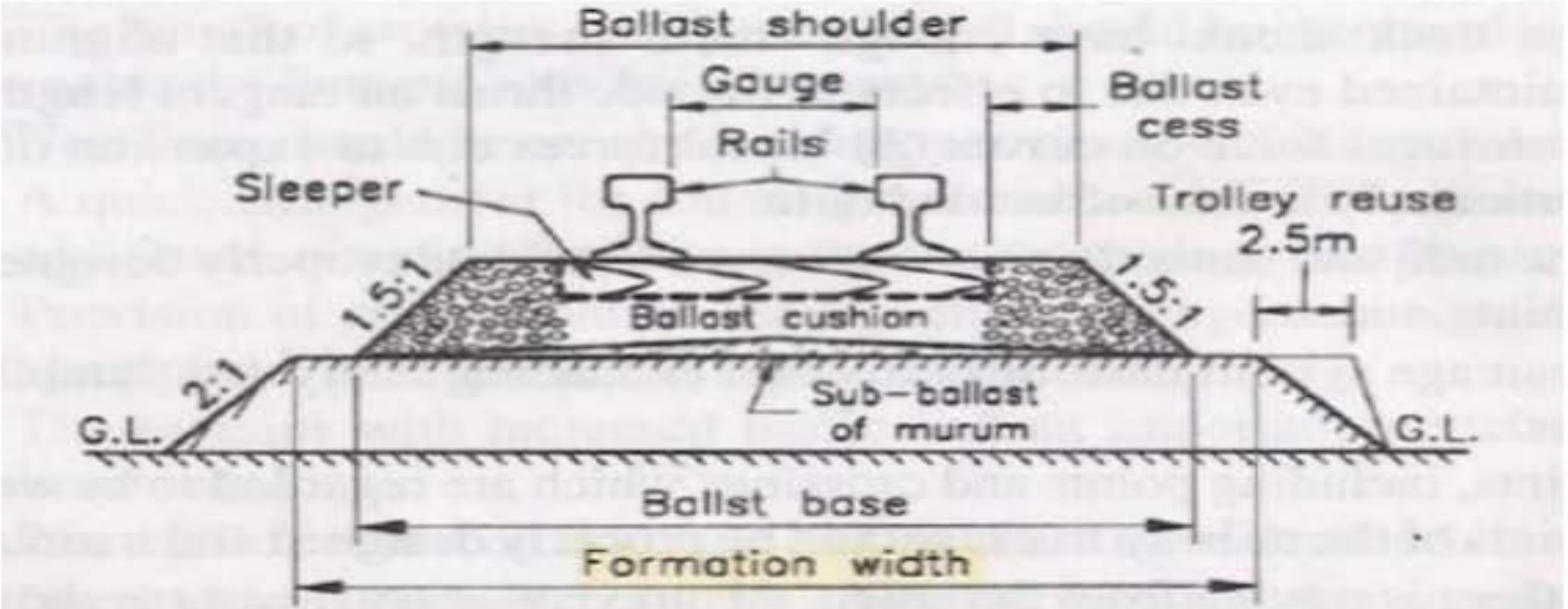


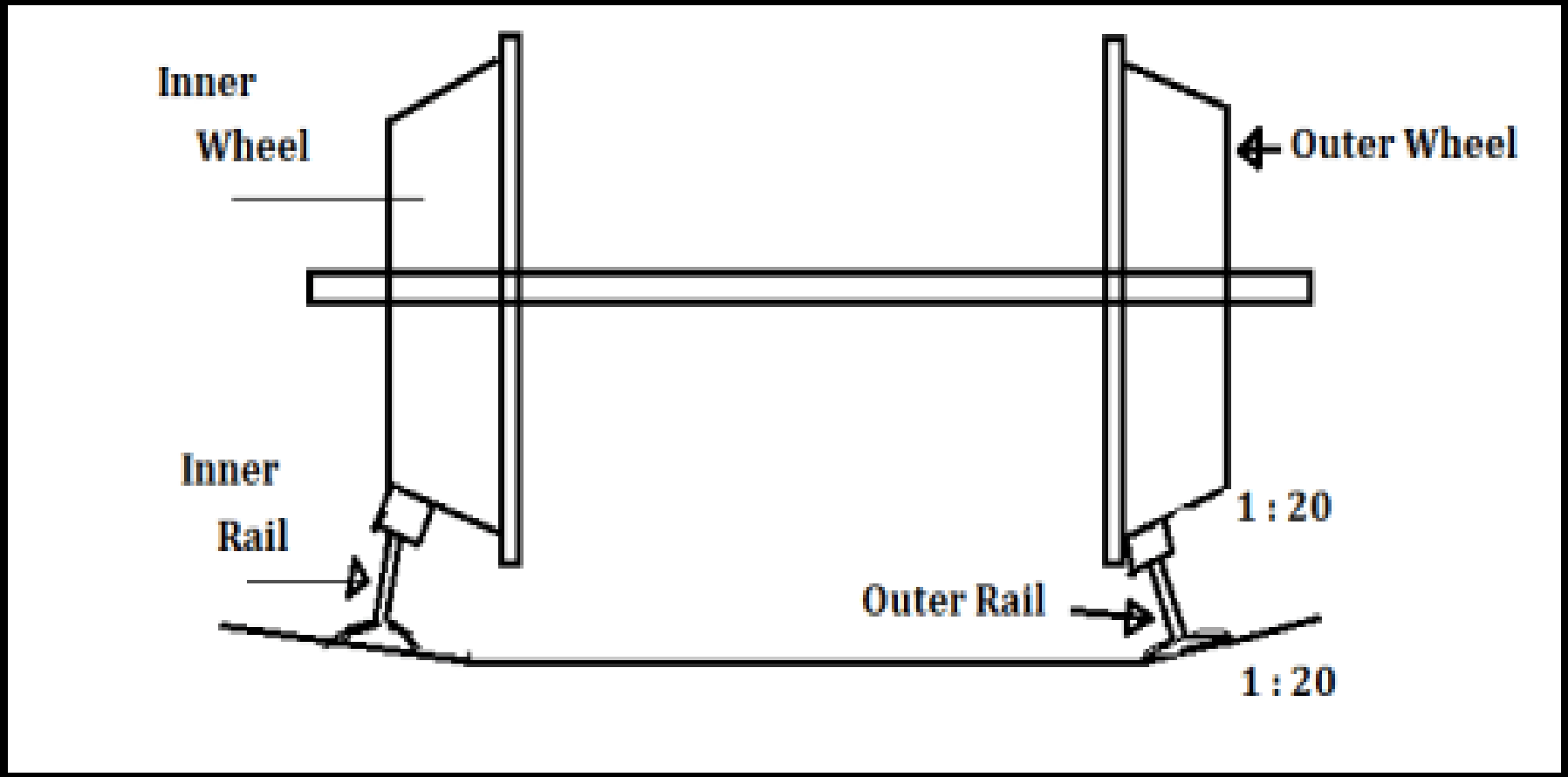
Fig. 3.1 Typical Cross-section of a Permanent Way on Embankment.

Types of gauges

- Broad guage – 1676mm
- Metre guage – 1000mm
- Narrow gauge – 762mm **or**
- 610mm which is also called light or feeder guage.

- Dicuss uniformity of gauge

Coning of wheels and tilting of rails-



Buckling of rails

Superelevation

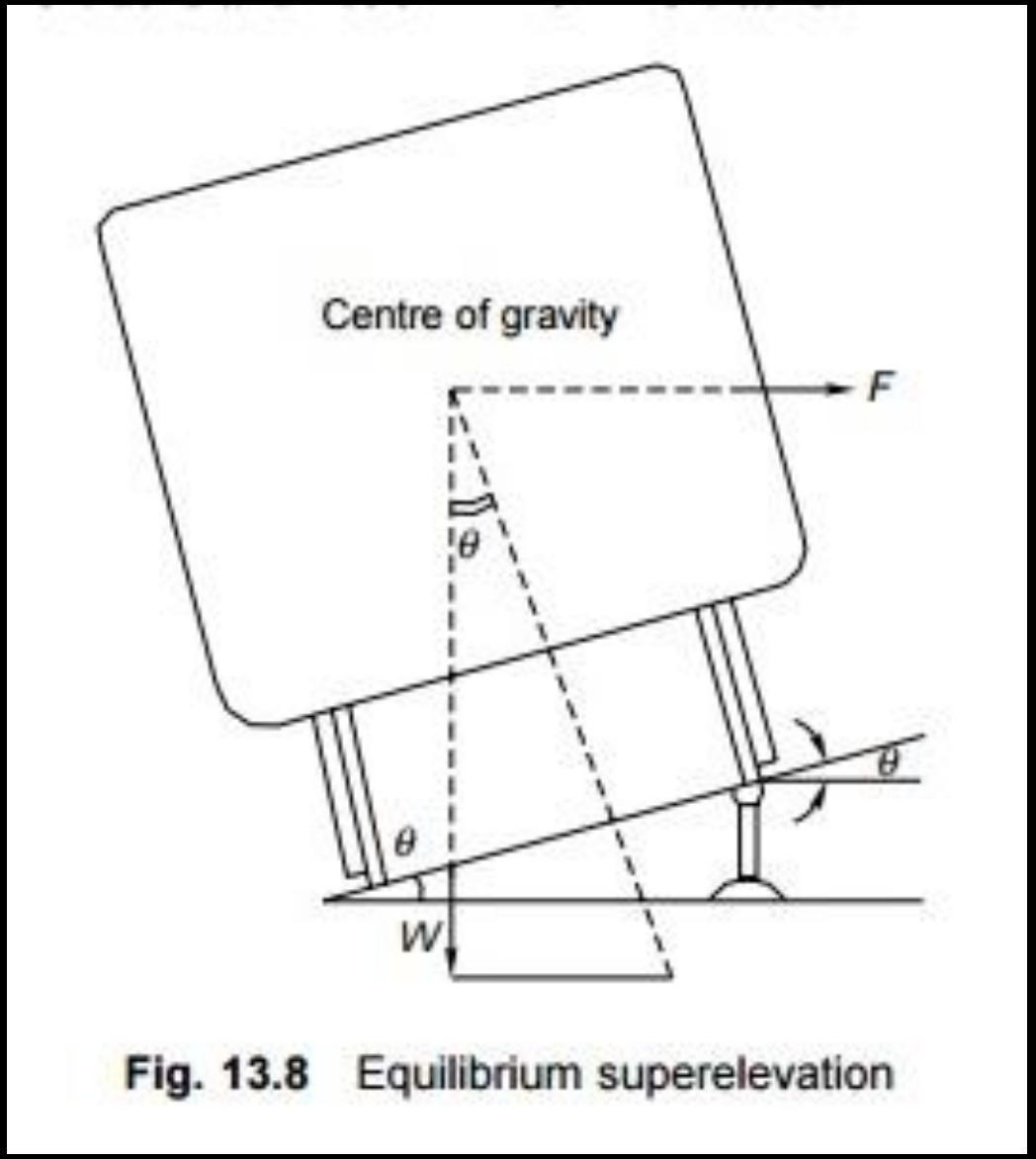


Fig. 13.8 Equilibrium superelevation

Raising the outer rail wrt to the inner rail in order to counteract the centrifugal forces while negotiating a horizontal curve is called superelevation , canting or banking.

Gradients

- Rate of rise or fall provided to formation along alignment of the track is called grade
- **Types of gradients**
- Ruling
- Momentum
- Pusher
- Station yard

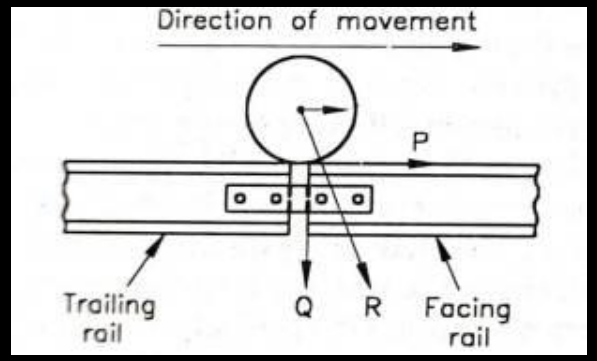
Curves

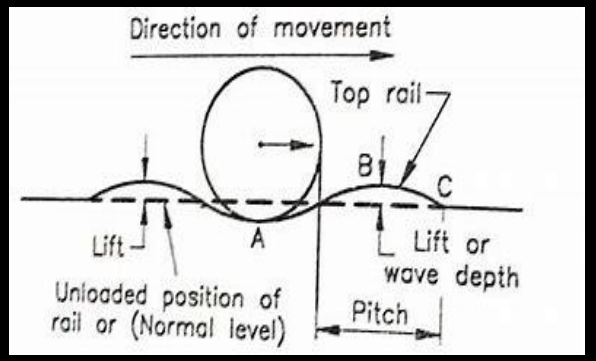
- Horizontal
- Vertical

Creep of rails

- Longitudnal movement of rails in atrack is called creep of rails.

- Causes of creep-
- Wave theory
- Percussion theory
- others





Rail fastenings

- Fish plates
- Bearing plates
- Bolts or dog spikes etc
- Chairs and keys

Fish plate and chair

Thankyouuuuuuu uuuuuuuuuuuuuu uuuuuuuuuuuuuu uuuuuuuuuuuu