

Rail Joints



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Rail Joints

- Rail joints are necessary to hold together the adjoining ends
- of the rails in the correct position, both in the horizontal &
- vertical planes.
- ☐ It is the weakest part of the track.

Problems created due to Rails –joints

- a. Weakest link in track
- b. Break of continuity (horizontal & vertical)
- c. Blow of wheels–loosening of fish plate, ballast, fastenings etc.
- d. Wear & tear of track components
- e. Impact at rail joints – reduce life span of rails, sleepers & fastenings
- f. Noise is created
- g. Increases fuel consumption

Requirements of an Ideal Rails joints

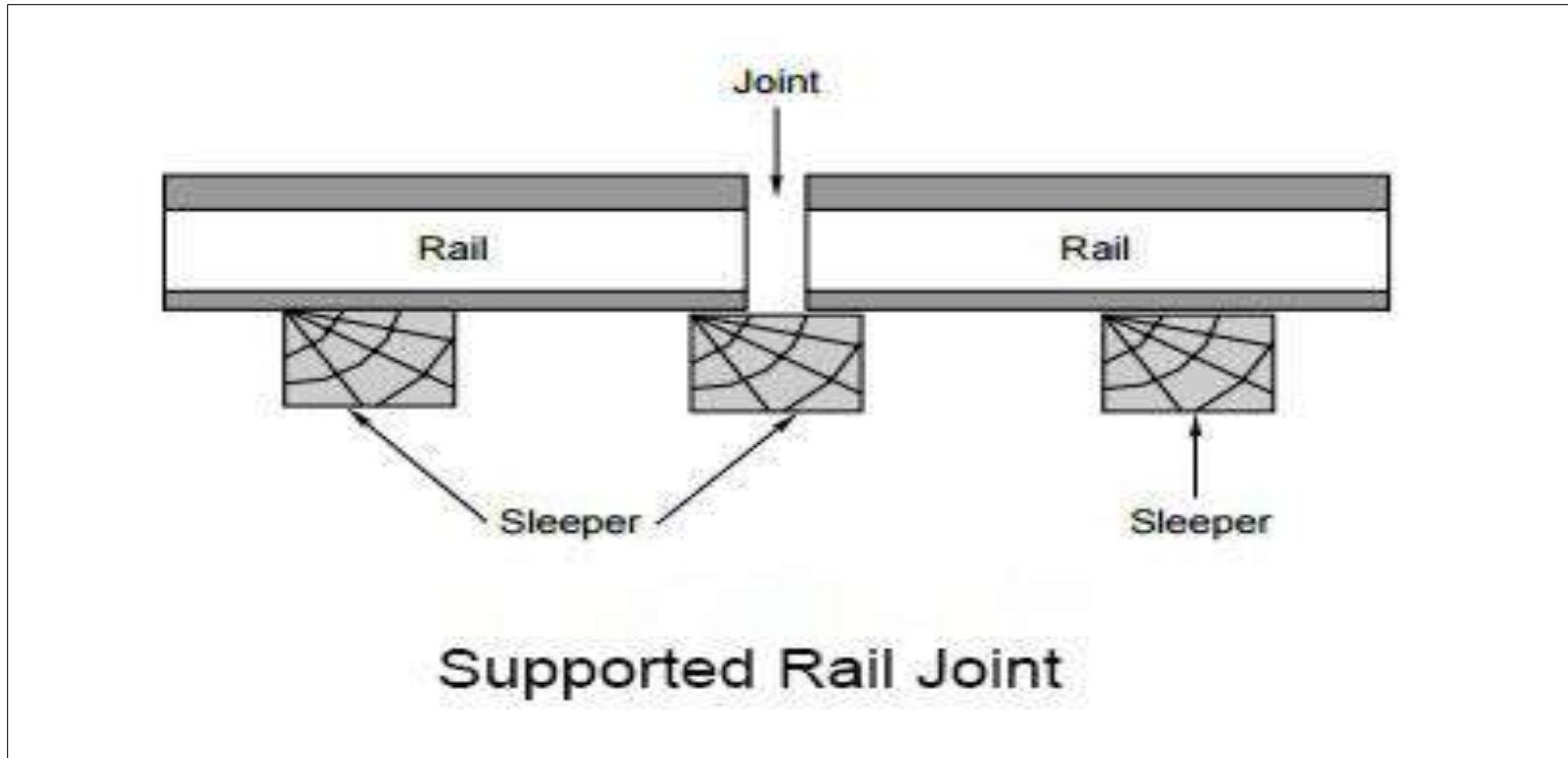
- a) Holding rail ends for continuity.
- b) Sufficient strength & stiffness.
- c) Adequate expansion gap.
- d) Easy removal or replacement, flexibility.
- e) Provision for wear at rail ends. It should not allow the rail ends to get battered in any case.
- f) Adequate elasticity.
- g) The joint should fulfill the above requirements with the minimum of initial & maintenance cost. (i.e. it should be economical)

Types of rail joints

- Supported rail joint
- Suspended rail joint
- Bridge joint
- Base joint
- Welded rail joint
- Staggered / broken joint
- Square joint/Even joint
- Compromise joint
- Insulated joint
- Expansion joint

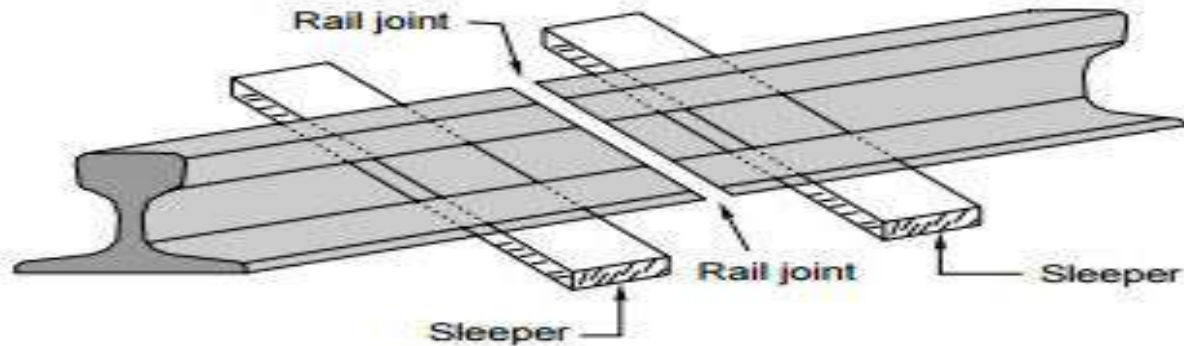
1. Supported rail joint

- When the rail ends rest on a single sleeper called a “ Joint Sleeper” it is termed as “ Supported joint”.



2.Suspended rail joint

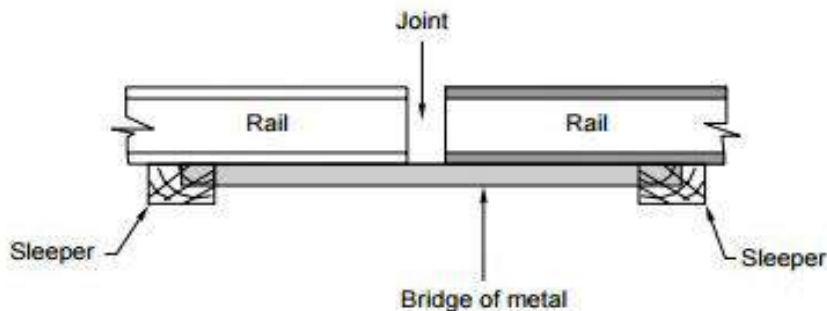
- When the rail ends are projected beyond sleepers called “Shoulder Sleeper” and the joint is termed as “Suspended rail joint”.
- This type of joint is generally used with timber & steel through sleepers on Indian & foreign railways.



Suspended Rail Joint

3. Bridge joint

- When the rail ends are projected beyond sleepers as in case of suspended joint & they are connected by a flat or corrugated plates called a “ Bridge plate” it is termed as a bridge joint.
- This type of joint is not used on Indian railways.



Bridge Joint with Metal Flat

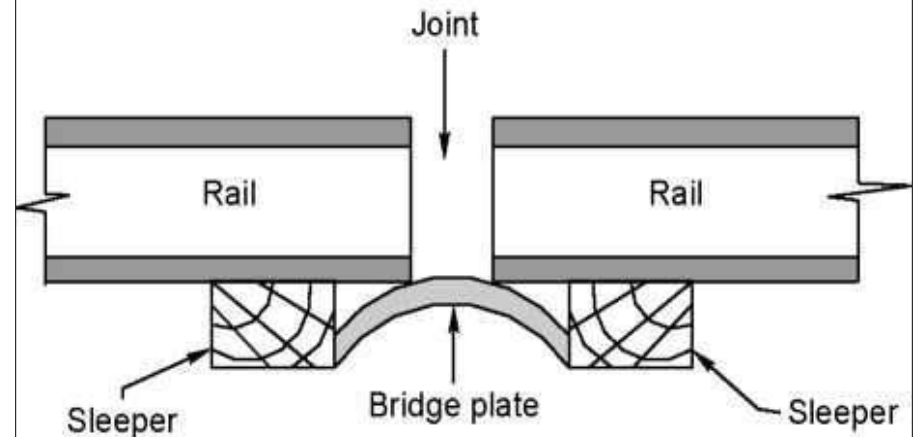


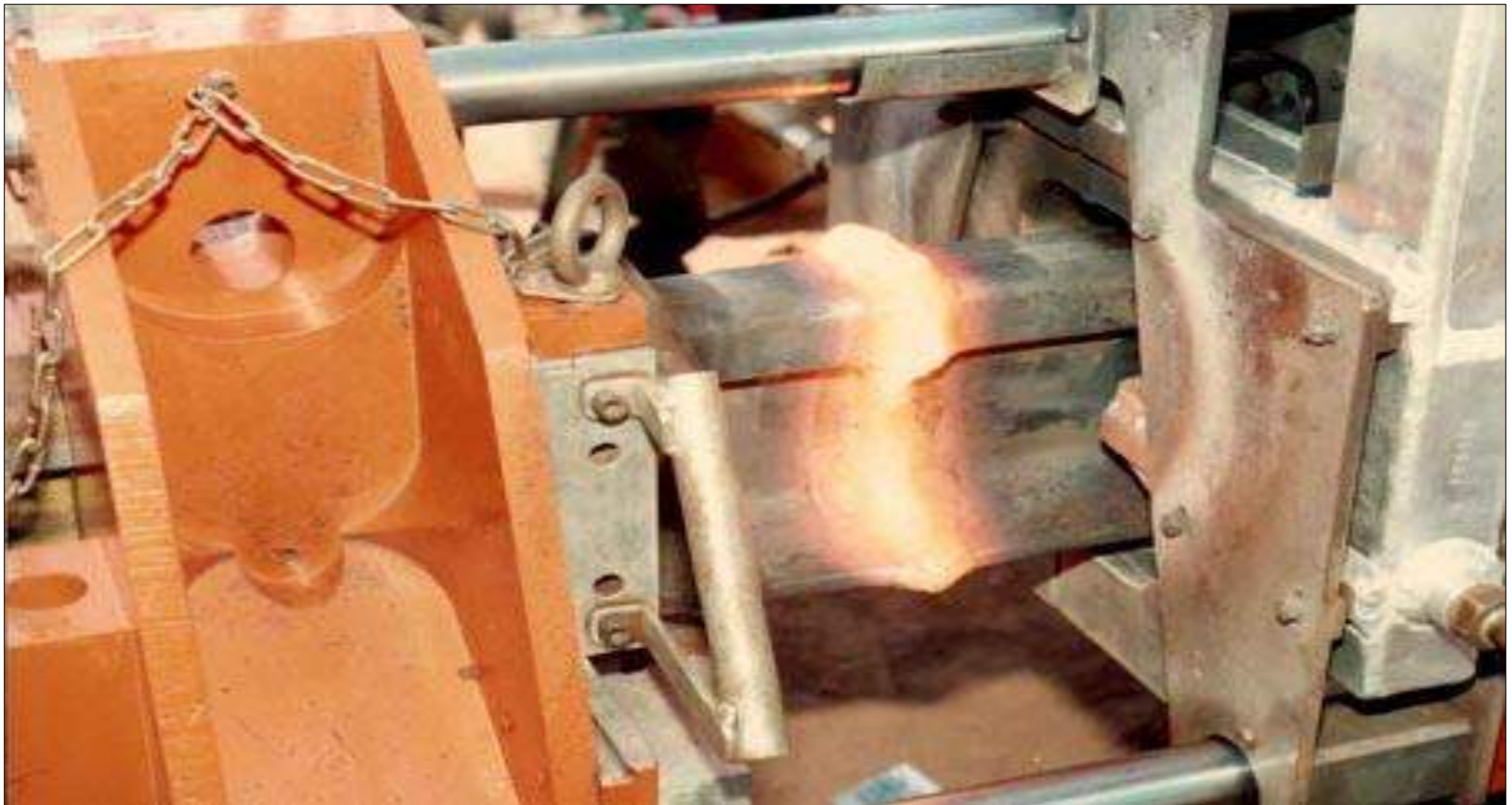
Fig. 16.3 (b) Bridge joint with bridge plate

4.Base joint

- This is similar to bridge joint, with the difference that the inner fish plates are of bar type and outer fish plates are of the special angle type, in which the horizontal leg is further extended over the sleepers to be bolted to both bridge plate and sleeper.
- Due to complicated design , this is not generally used.

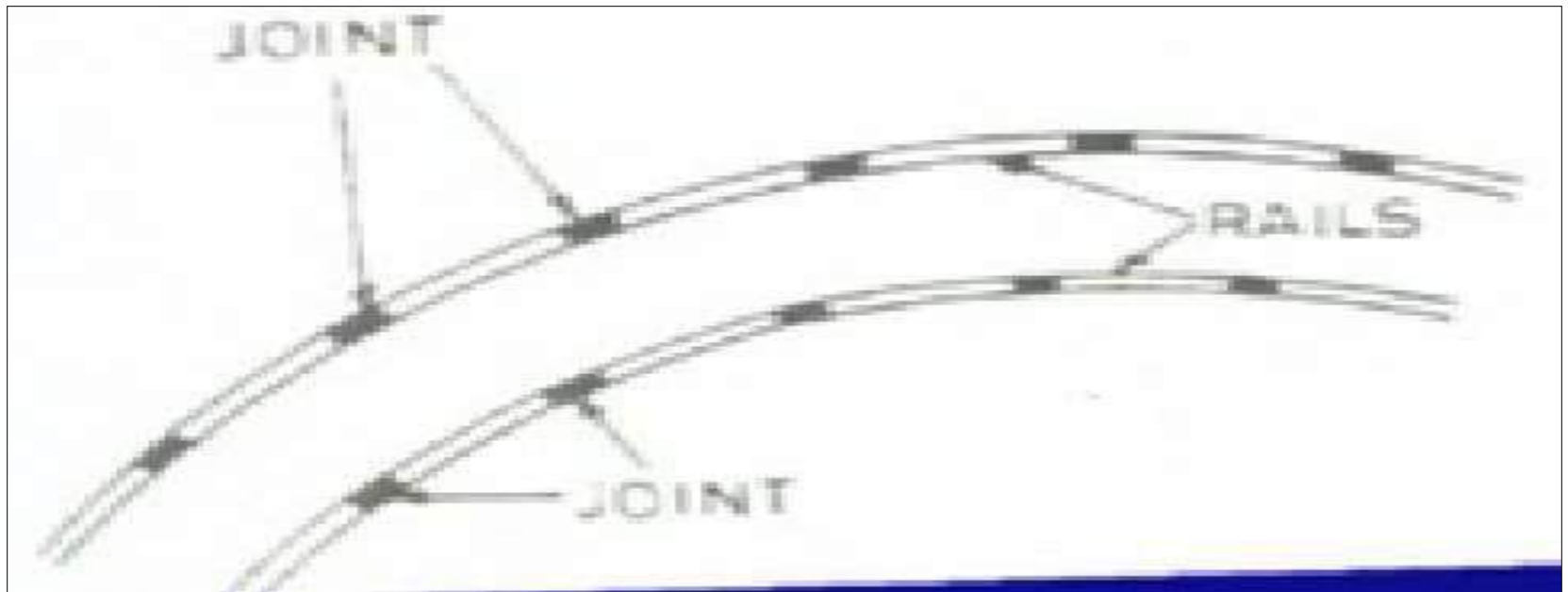
5.Welded joint

- These are the best joints as they fulfil nearly all the requirements of an ideal or perfect joint .



6. Staggered / broken joint

- The joints on railway track are not directly opposite to the joints of the rail track.
- These joints are generally provided on curves, where the length of outer curved track is greater than the length of inner curved track.



7. Square or Even joint

- The joint of the one railway track are directly opposite to the joints of other rail track. This type is generally used on straight track.

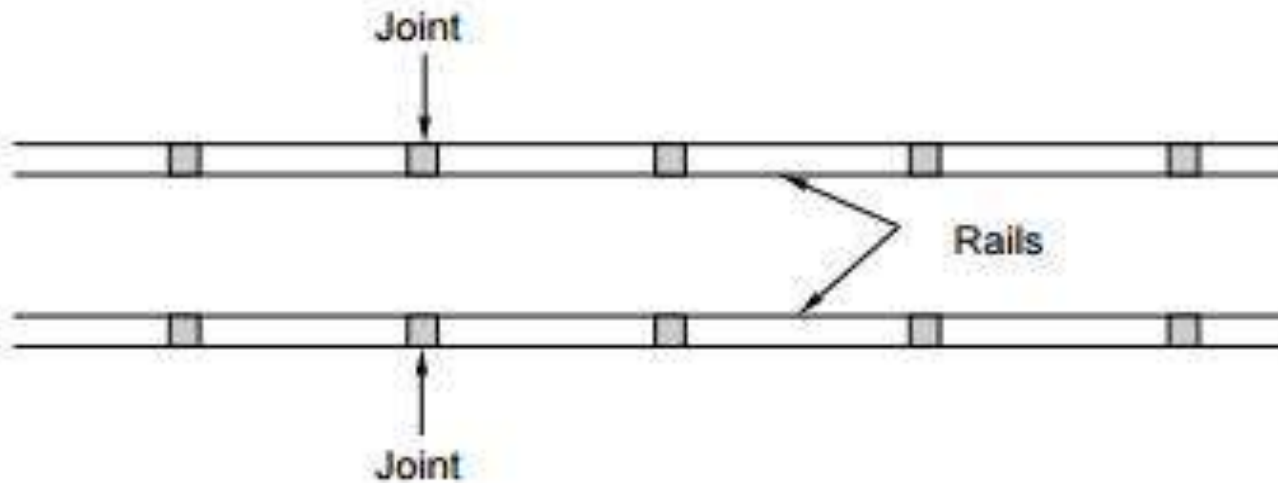


Fig. 16.4 Square joint

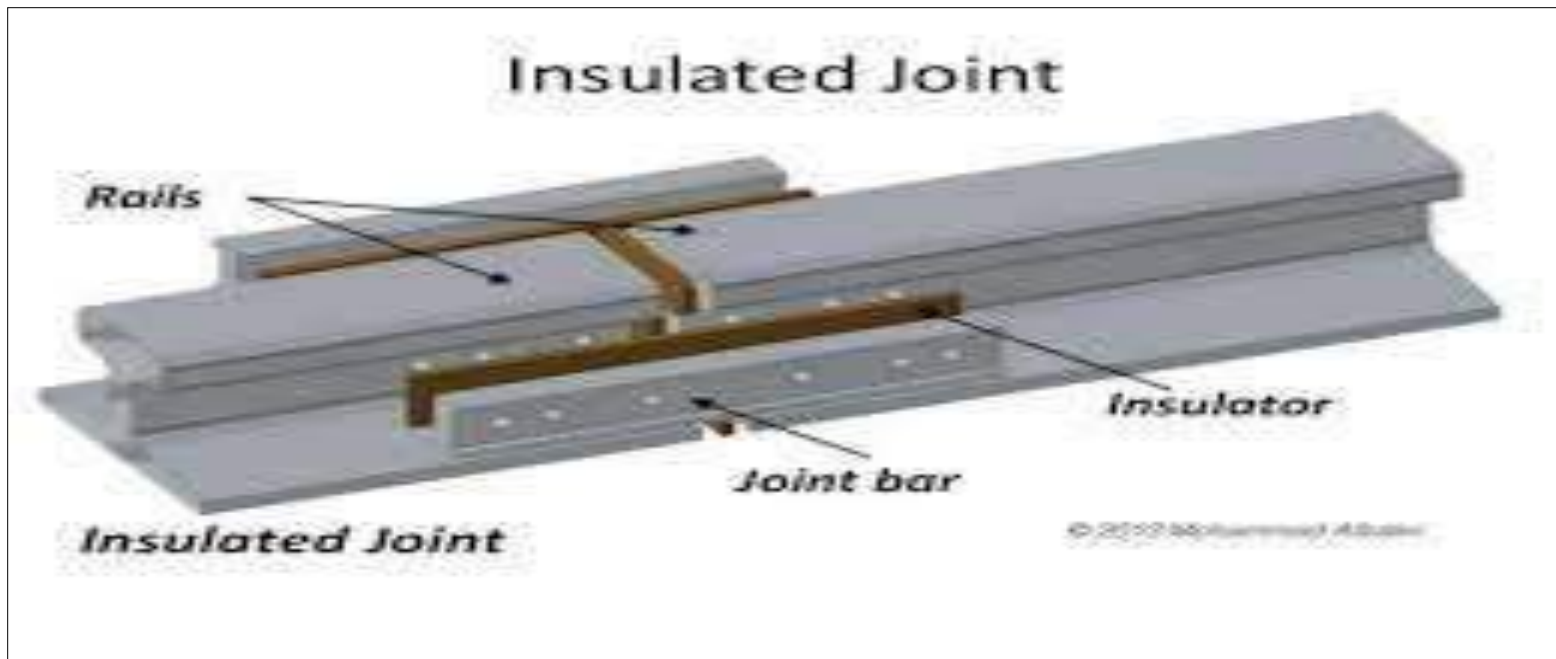
Compromise joint

- Where two different rail sections are required to be jointed together, it is done by means of fish plates which fit both the rails and this is joint termed as compromise joint



9. Insulated joint

- When insulating medium is inserted in a rail joint to stop the flow of current beyond the track- circuited part, it is called insulated joint.



10.Expansion joint

- In bridges , provision for expansion and contraction is kept for girders and rails both.

