



**NOTES ON BRANCHING OF TRACKS
PREPARED BY SEEMA TEWARY GHOSH
LECTURER ,DEPT. OF CIVIL ENGG. JCGP**

TURNOUT

Turnout is an arrangement of points and crossings with lead rails by which trains may be diverted from one track to another moving in the facing direction

A turnout is left handed or right handed as the train taking the turnout in the facing direction is diverted to the left or right of the main line.

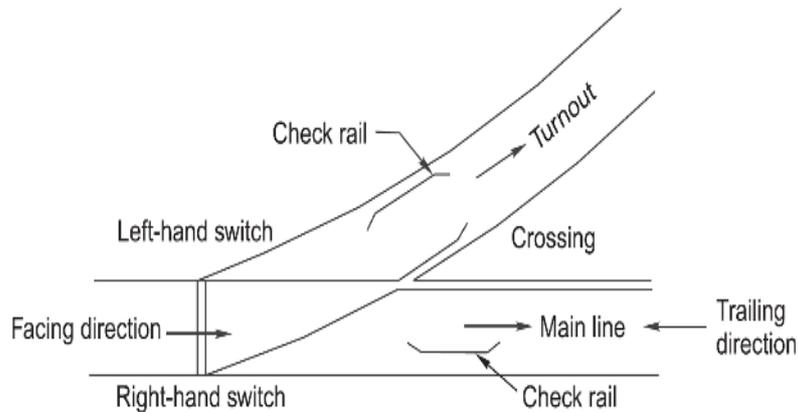


Fig. 14.1 (b) Left-hand turnout

Component parts of a Turnout and their Functions

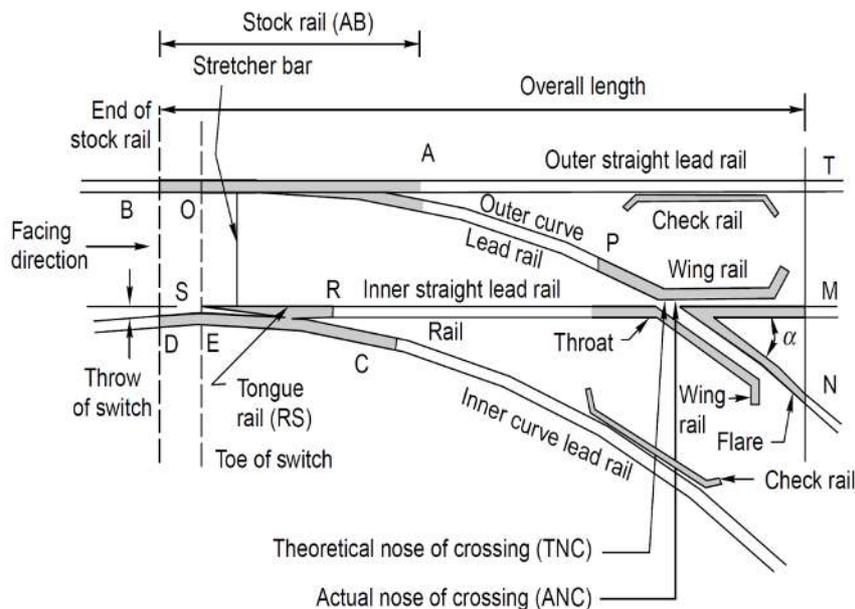


Fig. 14.1 (a) Constituents of a turnout



Following are the component parts of a turnout

- (i) A pair of tongue rails
- (ii) A pair of stock rails
- (iii) Two check rails
- (iv) Four lead rails
- (v) A vee crossing
- (vi) Slide chairs
- (vii) Stretcher bar
- (viii) A pair of heel blocks
- (ix) Switch tie plate or gauge tie chair
- (x) Parts for operating points – Rods, cranks, levers etc.
- (xi) Locking system which includes locking box, lock bar, plunger bar etc.

(i) **A Pair of Tongue Rails**: The tongue rails along the stock rails in a turnout form a pair of points or switches. The tongue rails facilitate the diversion of a train from the main track to a branch track.

(ii) **A Pair of Stock Rails**: They are the main rails to which the tongue rails fit closely. The stock rails help in smooth working of tongue rails.

(iii) **Two Check Rails**: Check rails are provided adjacent to the lead rails, one in main track and another in branch track. These rails check the tendency of wheels to climb over the crossing.

(iv) **Four Lead Rails**: Outer straight lead rail, outer curve lead rail, inner straight lead rail and inner curve lead rail are the four lead rails provided in a turnout. The function of these rails is to lead the track from heel of switches to the toe of crossing.

(v) **A Vee Crossing**: a Vee crossing is formed by two wing rails, a point rail and a splice rail. It provides gaps between the rails so that wheel flanges pass through them without any obstruction.

(vi) **Slide Chairs**: Slide chairs are provided to support the tongue rail throughout their length and to allow lateral movement for changing of points.

(vii) **Stretcher Bar**: Stretcher bar connects toes of both the tongue rails so that each tongue rail moves through the same distance while changing the points.

(viii) **A Pair of Heel Blocks**: These keep the heel ends of both the tongue rails at fixed distance from their respective stock rails.

(ix) **Switch Tie Plate**: The function of switch tie plate is to hold the track rigidly to the definite gauge at the toe of switches. These are provided below the slide chairs.



CROSSING

Crossing is a device provided at the intersection of two running rails to permit the wheel flanges, moving along one to pass across the other.

Component Parts of a Crossing

- (i) A vee piece
- (ii) A point rail
- (iii) A splice rail
- (iv) Two check rails
- (v) Two wing rails
- (vi) Heel blocks at throat, nose and heel of crossing
- (vii) Chairs at crossing, at toe and at heel.

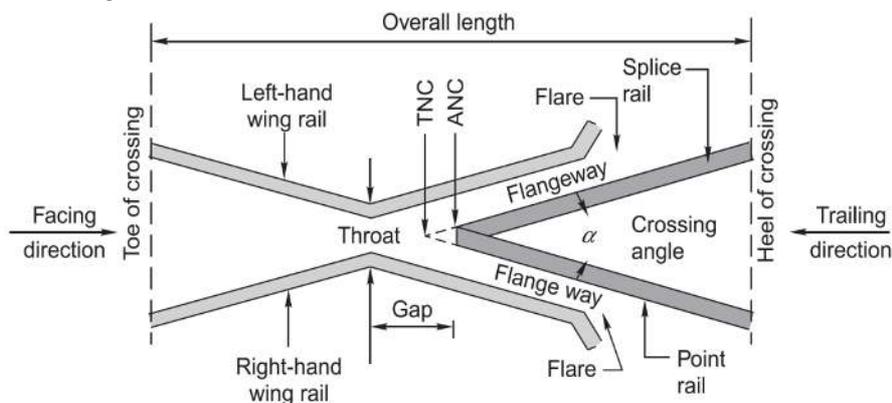


Fig. 14.5 Details of a crossing

REQUIREMENTS OF IDEAL CROSSING

- (i) Crossing assembly should be rigid enough to withstand severe vibrations.
- (ii) Wing rails and nose of crossing should be able to resist heavy wear due to movement of wheels, hence should be manufactured of special steel (alloy steel).
- (iii) The nose of crossing should have adequate thickness to take all stresses acting on the crossing.

TYPES OF CROSSINGS

Crossings can be classified as follows:

1. On the basis of shape of crossing
 - (a) Square crossing
 - (b) Acute angle or V-crossing or Frog
 - (c) Obtuse angle or Diamond crossing
2. On the basis of assembly of crossing
 - (a) Ramped crossing
 - (b) Spring or movable crossing.

Square Crossing

Square crossing is formed when two straight tracks of same or different gauge, cross each other at right angles. This type of crossing should be avoided on main lines because of heavy wear of rails.

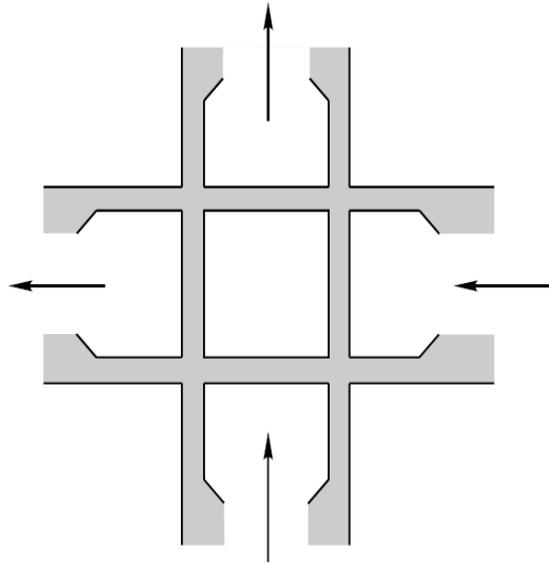


Fig. 14.7 Square crossing



Acute Angle Crossing

Acute angle crossing is formed when left hand rail of one track crosses right hand rail of another track at an acute angle or vice versa. This type of crossing consists of a pair of wing rails, a pair of check rails, a point rail and a splice rail. This crossing is widely used. This is also called V-crossing or frog.

Obtuse Angle Crossing

Obtuse angle crossing is formed when left hand rail of one track crosses right hand rail of another track at an obtuse angle or vice versa. This type of crossing consists mainly of two acute angle and two obtuse angle crossings. This is also called Diamond crossing.

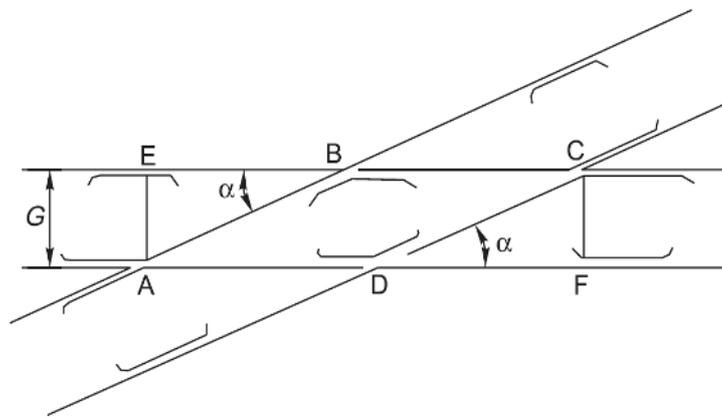


Fig. 15.9 Diamond crossing



LINE SKETCHES OF

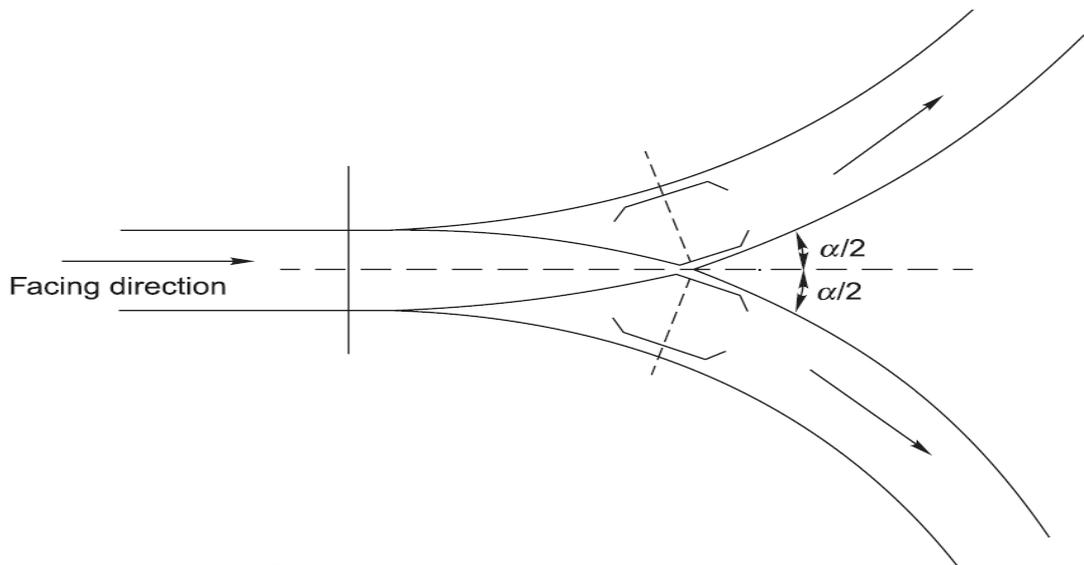


Fig. 15.3 Symmetrical split



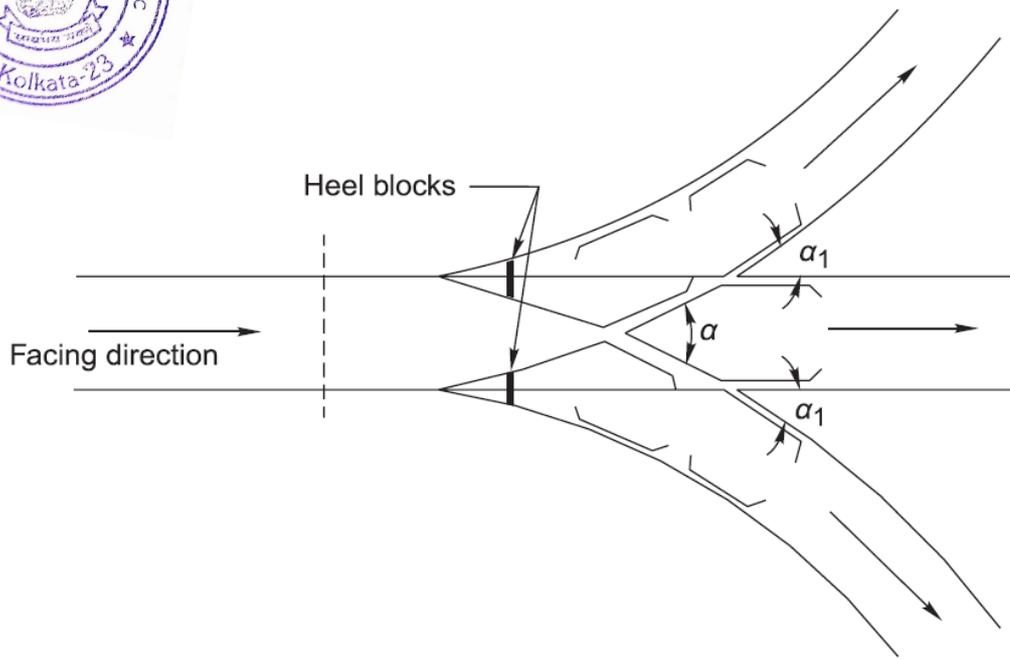


Fig. 15.4 Three-throw switch (contrary flexure)

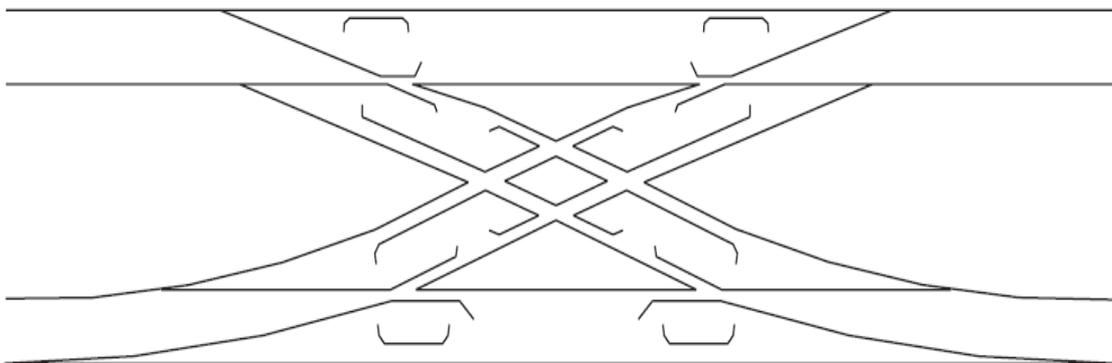


Fig. 15.12 Scissors crossover

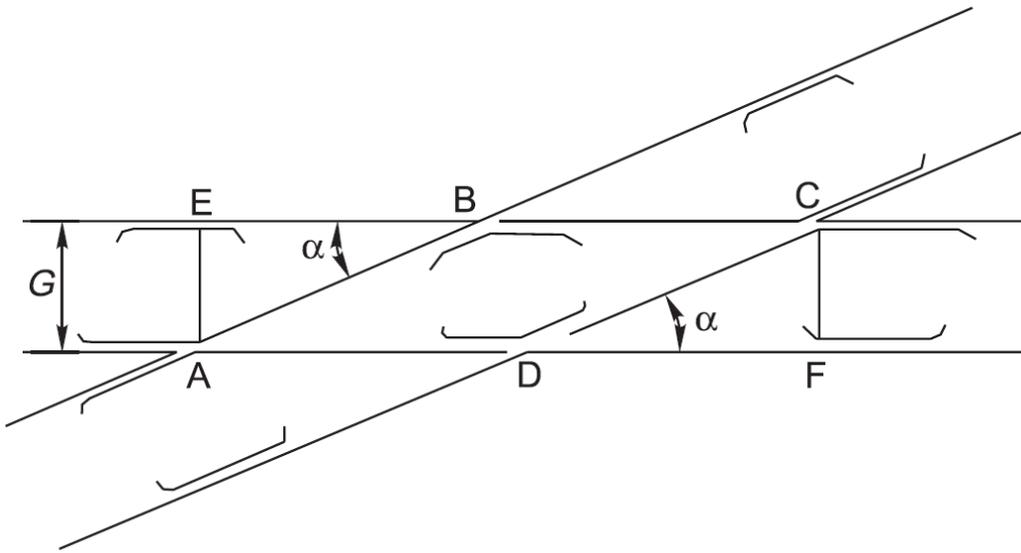


Fig. 15.9 Diamond crossing

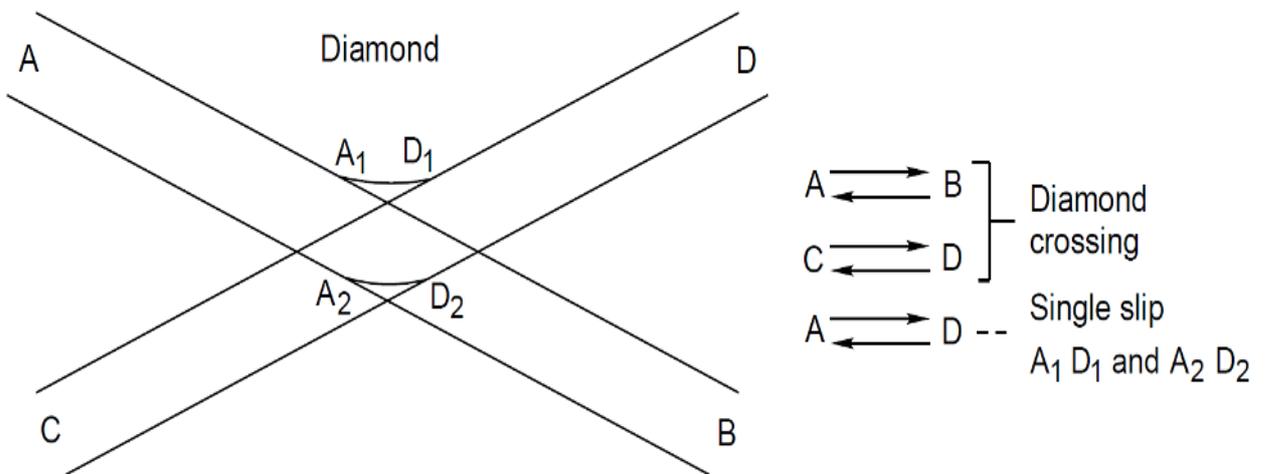


Fig. 15.10 Single slip



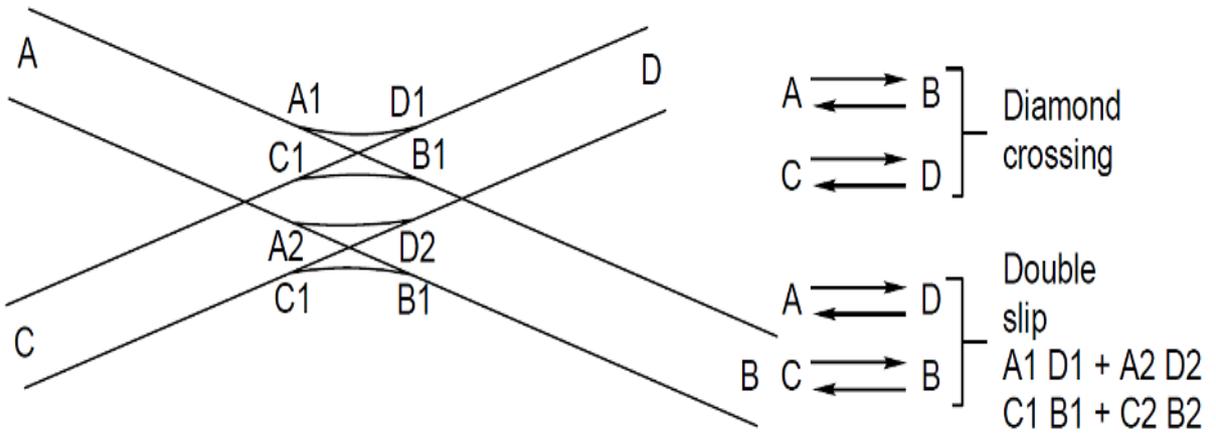


Fig. 15.11 Double slip

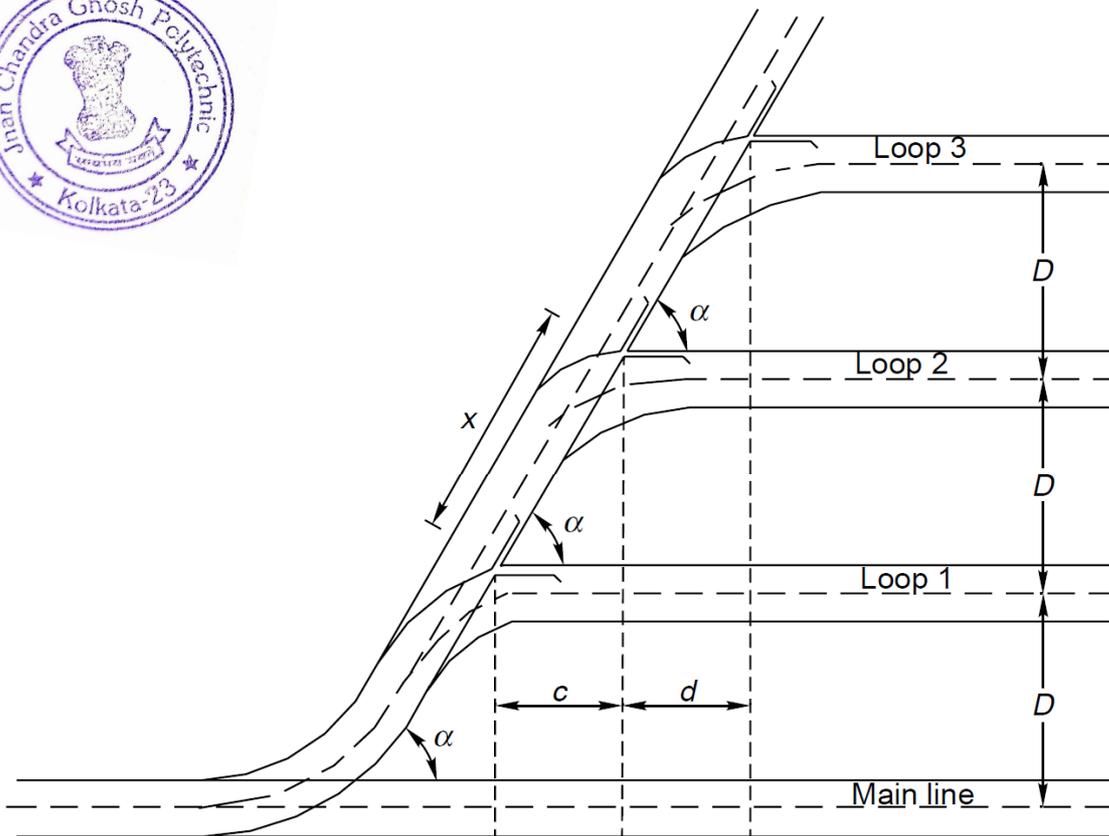


Fig. 15.14 Gathering line

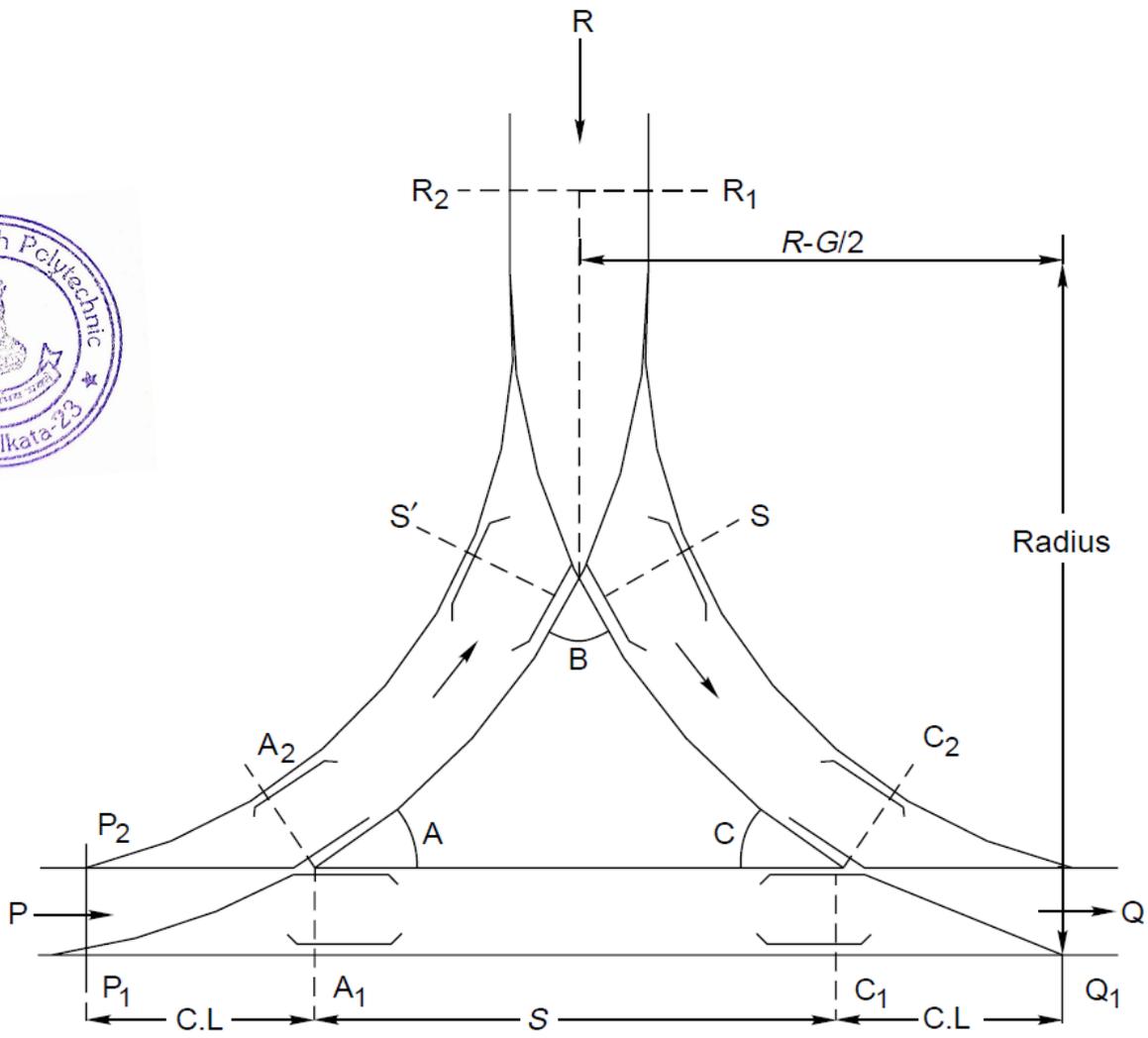


Fig. 15.16 Triangle