RAILWAY ENGINEERING

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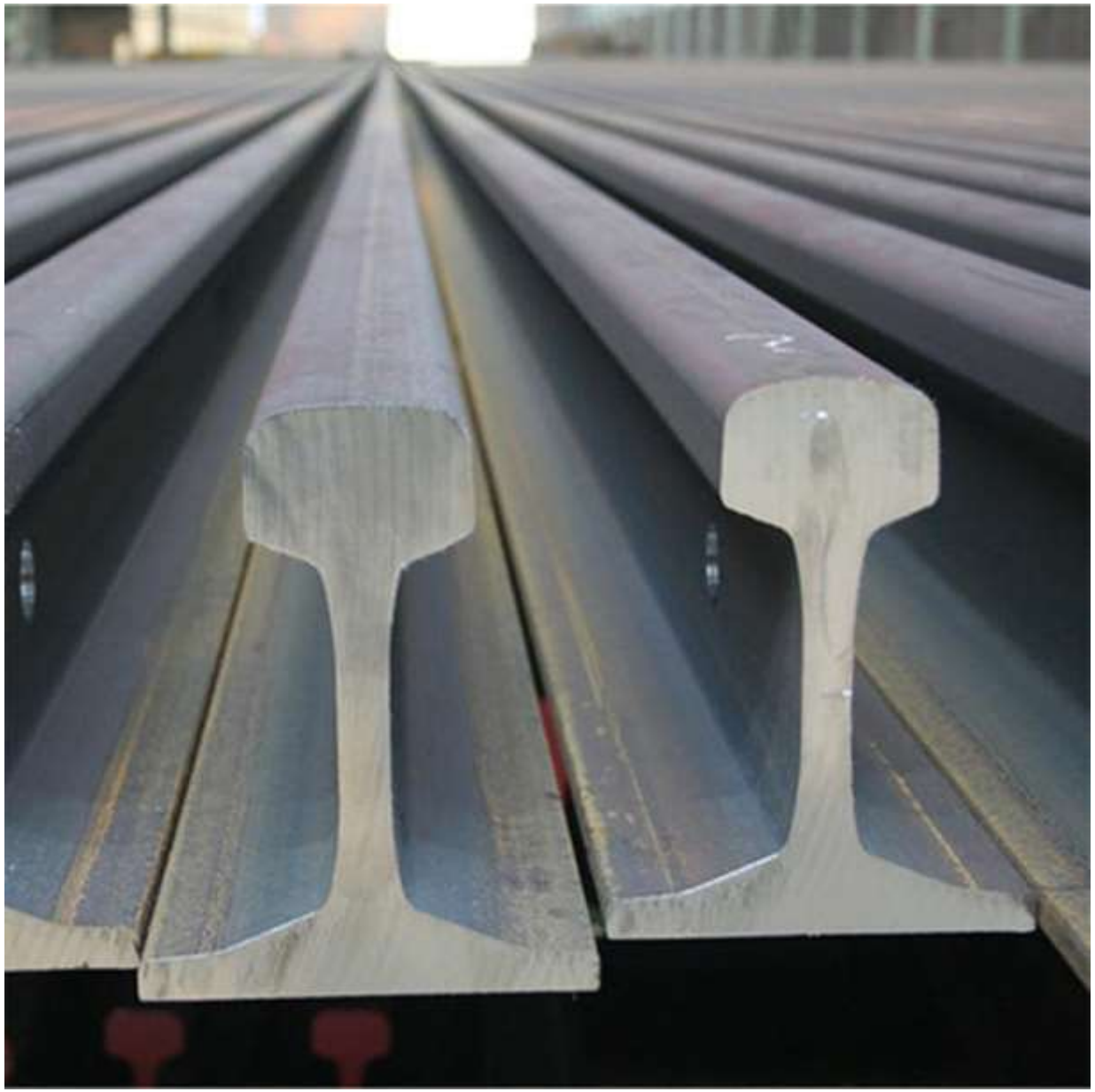
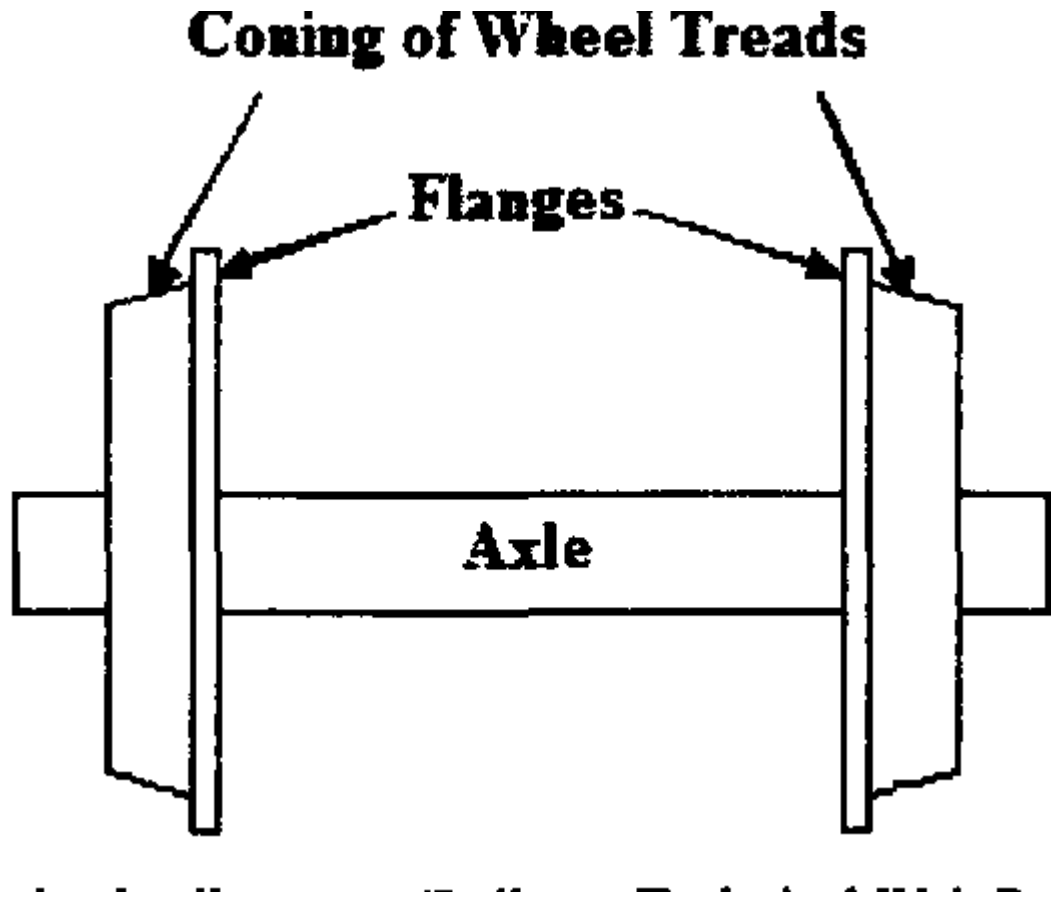
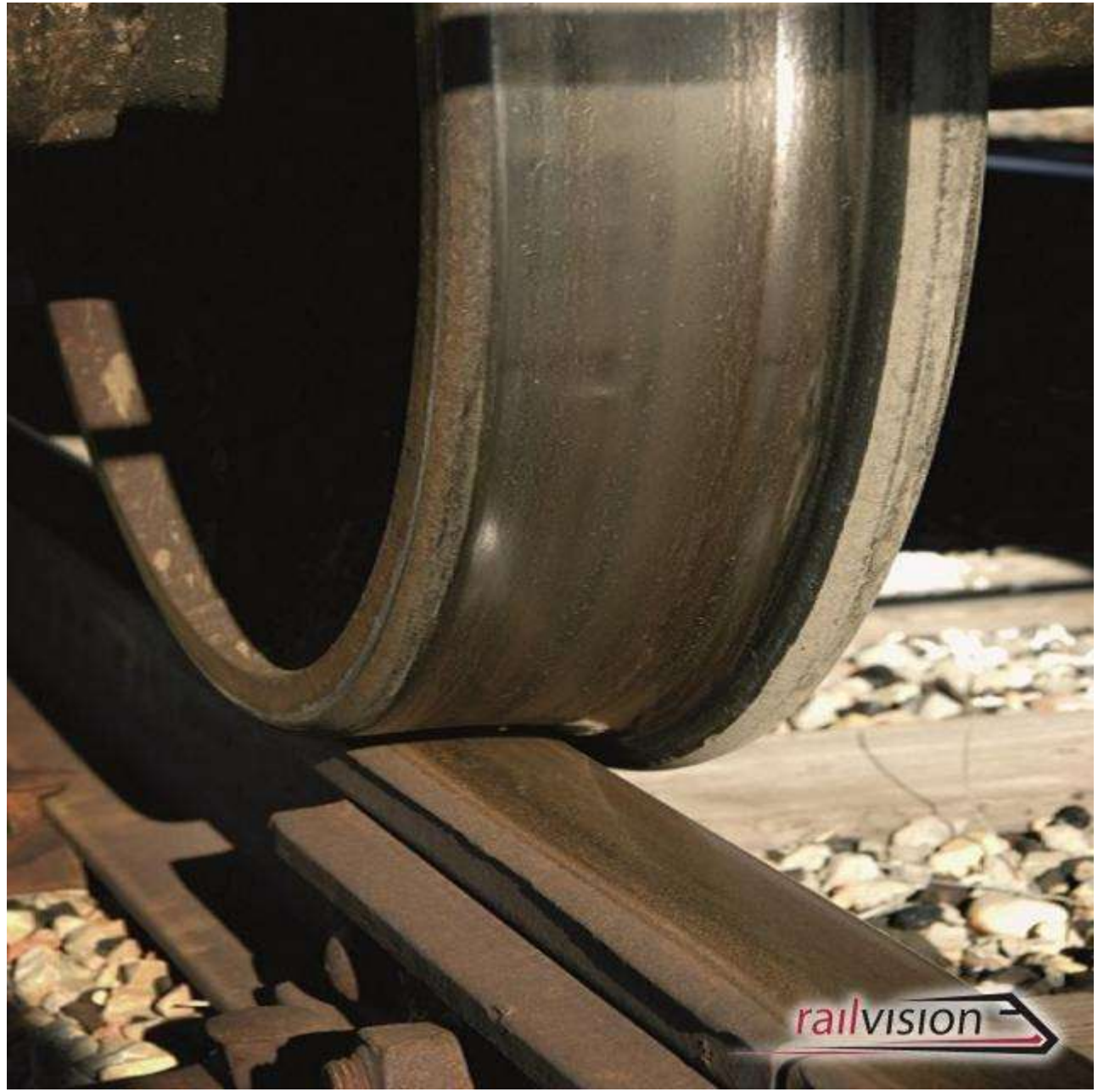
SLEEPERS




Coning of Wheel Treads
Flanges
Axle


railvision

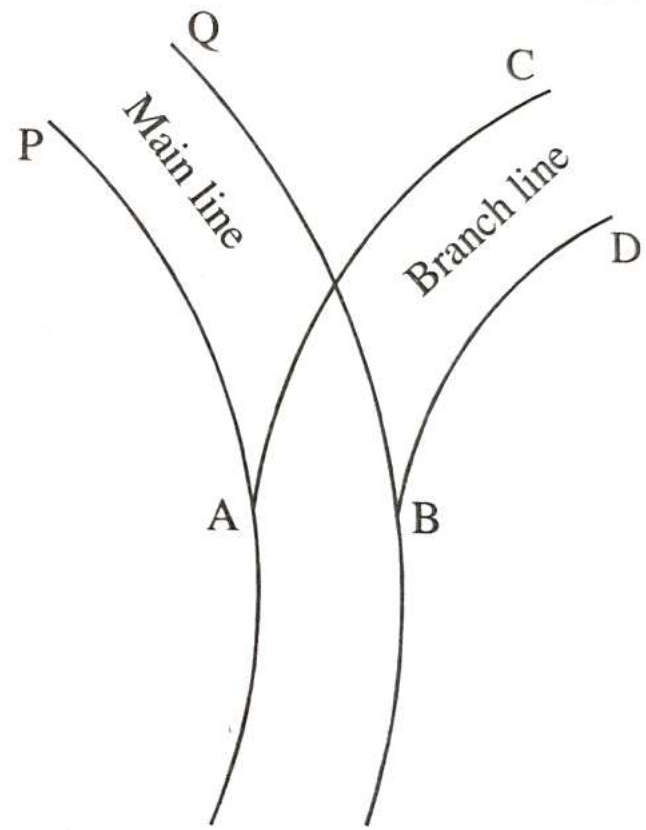

6 1950
B R

Table 15.2 Limits of Cant Deficiency

Gauge	*Cant deficiency for speeds upto 100 km. p.h.*	*Cant deficiency of speeds higher than 100 km. p.h.*
B.G.	7.6 cm (76 mm)	10.0 cm (100 mm)
M.G.	5.1 cm (51 mm)	not specified
N.G.	3.8 cm (38 mm)	— Do —

12-8. CANT DEFICIENCY AND NEGATIVE SUPER-ELEVATION

Under certain conditions, it is not possible to provide the equilibrium cant. See fig. 12-4. A branch line diverges from a main line. *AP* and *BQ* are the inner and outer rails respectively of main line; and *BD* and *AC* are the inner and outer rails respectively of branch line. Let S_1 and S_2 be the amounts of the super-elevation required for main and branch lines respectively. Following conditions should be satisfied:



Deficiency in super-elevation

FIG. 12-4

(i) Considering main line, the point *B* should be higher than point *A* by the amount S_1.

(ii) Considering branch line, the point *A* should be higher than point *B* by the amount S_2.

It is obvious that it is impossible to comply with both the conditions simultaneously and hence, under such circumstances, a small amount of deficiency in super-elevation is permitted without correspondingly reducing the speed. This is known as the *cant deficiency* or *deficiency in super-elevation* and it represents the amount by which the actual super-elevation falls short of the equilibrium super-elevation.

Thus, deficiency in super-elevation is the difference between the equilibrium cant necessary for the maximum permissible speed on a curve and the actual cant provided as per average speed of the trains. Following are the two limitations of cant deficiency:

(i) Increase in cant deficiency also increases discomfort to the passengers.

(ii) As cant deficiency increases, the balanced centrifugal force would also increase with extra pressure and lateral forces on outer rails. To withstand such forces and pressure, strong track and fastenings would require.

POINTS AND CROSSINGS

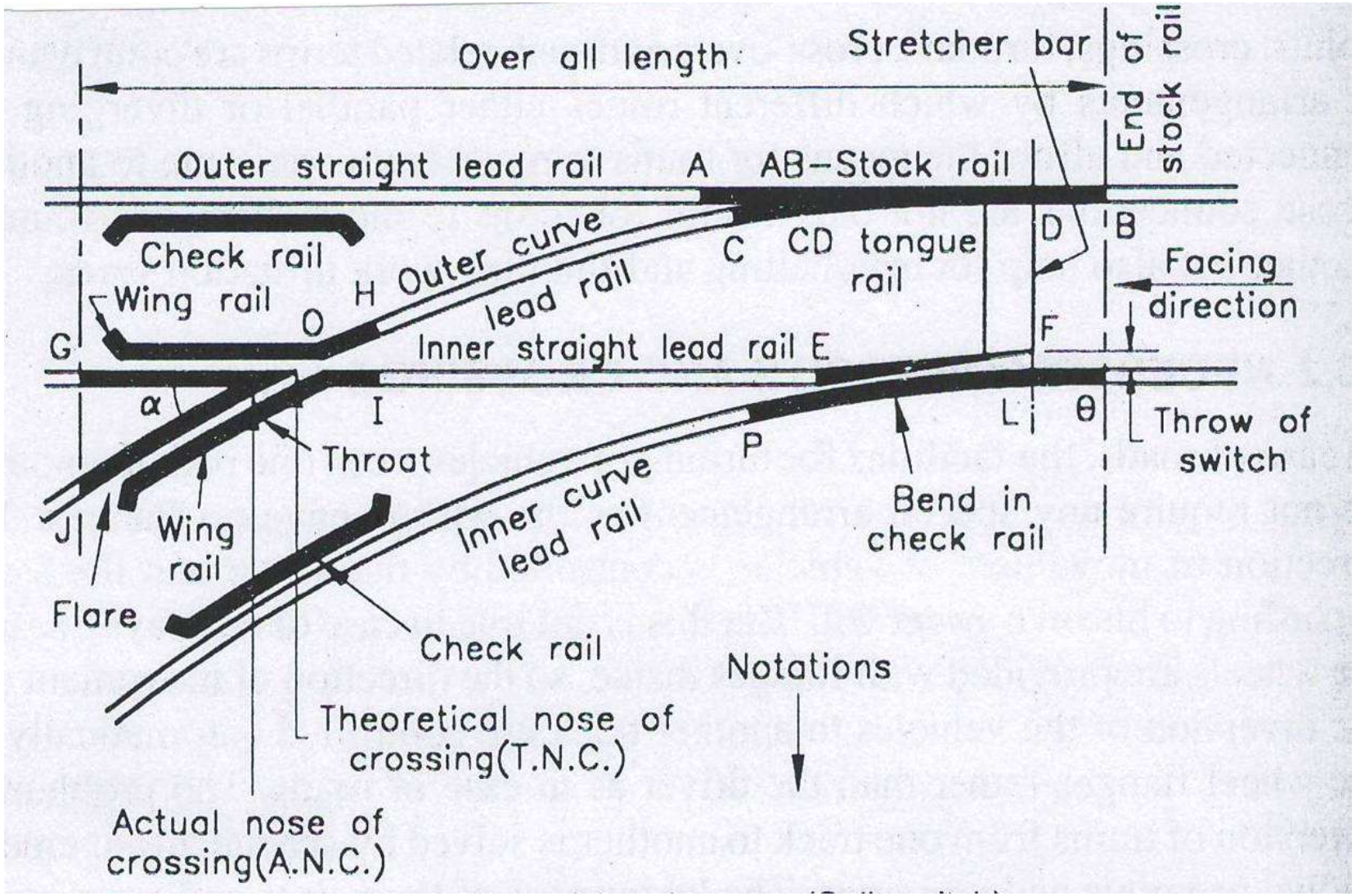
Turnout

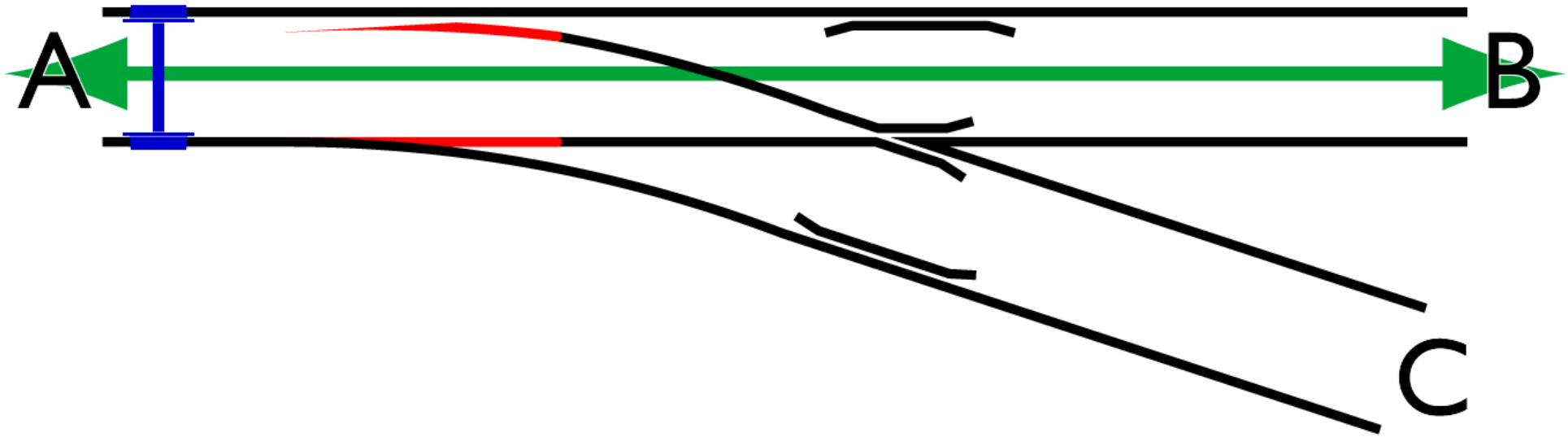
- In case of roads – vehicles move in any direction
- In case of Trains - not possible at will to change the direction
- Change is made possible with the provision of turnouts
- Consists of points and crossings.

Turnout - Definition

- Simple arrangement of points and crossings by the manipulation of which the train from one track may be diverted to the another track or branch line or to siding is known as turnout.
- 2 tracks either merge or diverge, or 2 tracks parallel to each other but are still connected to each other- This connection helps in changing the direction of trains.
- for this points and crossings are used.

Main Components of a Left Hand Turnout




A
B
C

Components of a Turnout

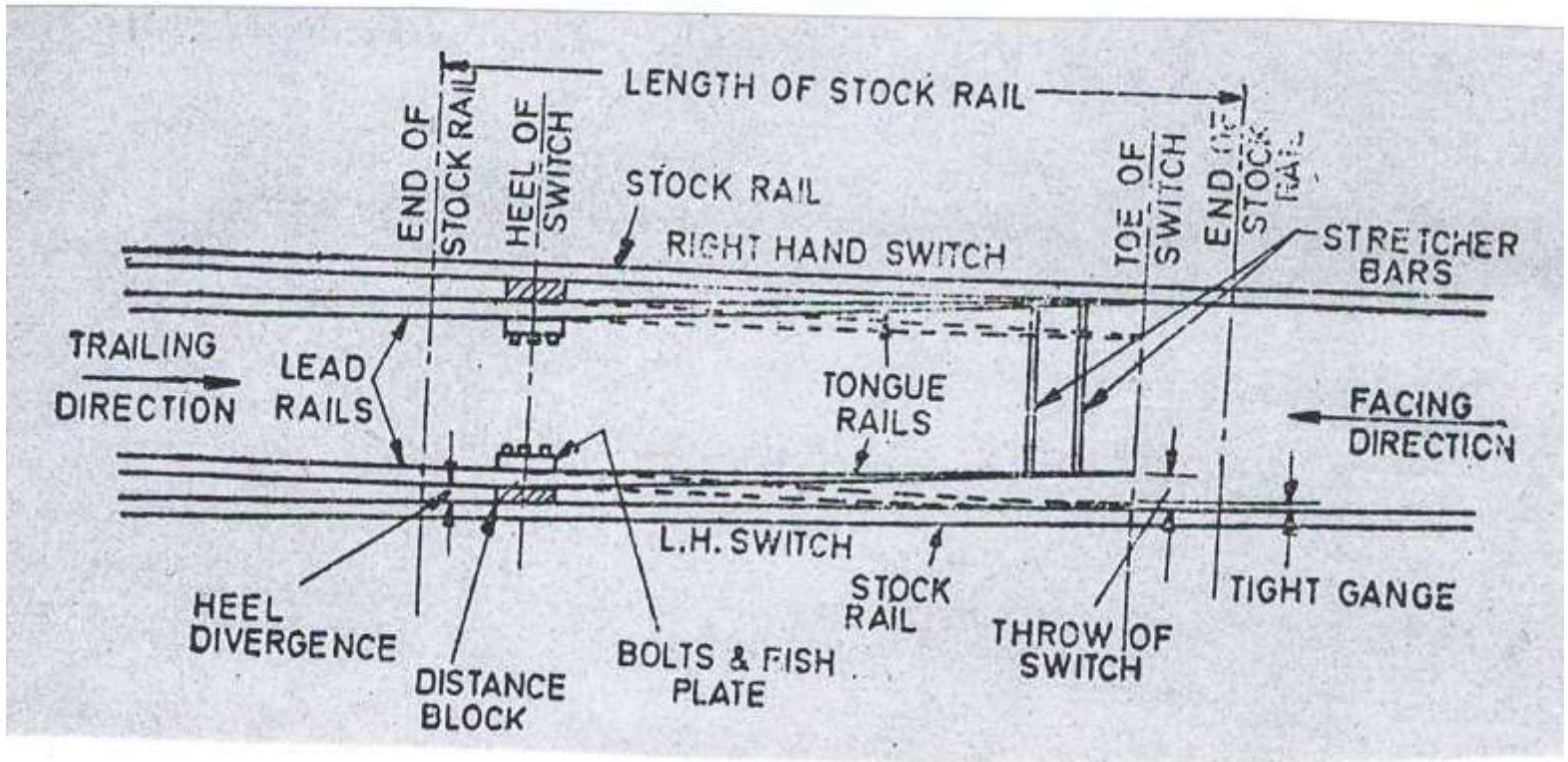
a) A pair of Points or Switches (ABCD and EFPQ)
b) A pair of stock rails
c) A Crossing (GHIJ)
d) Two Check rails
e) Four Lead Rails
f) For operating switches – Levers, Rods etc
g) A Locking system for switches
h) Heel Blocks

Terminology associated with Points and Crossings

a) Facing Direction: If somebody is standing at the toe of the switch and looks at crossing
b) Trailing Direction: If somebody stands at the crossing and looks towards switches
c) Facing Points of Turnouts: where train passes over the switches first and then over crossing
d) Trailing Points of Turnouts: where the train passes over the crossing first and then over points
e) Right Hand Turnout: When train turns or diverts to the right from main track
f) Left Hand Turnout: when a train turns or diverts to the left from main track

Working Principle of a Turnout

A Pair of Switches



Throw of Switch: 9.5 cm for BG
8.9 cm for MG

Working Principle of a Turnout

A Crossing

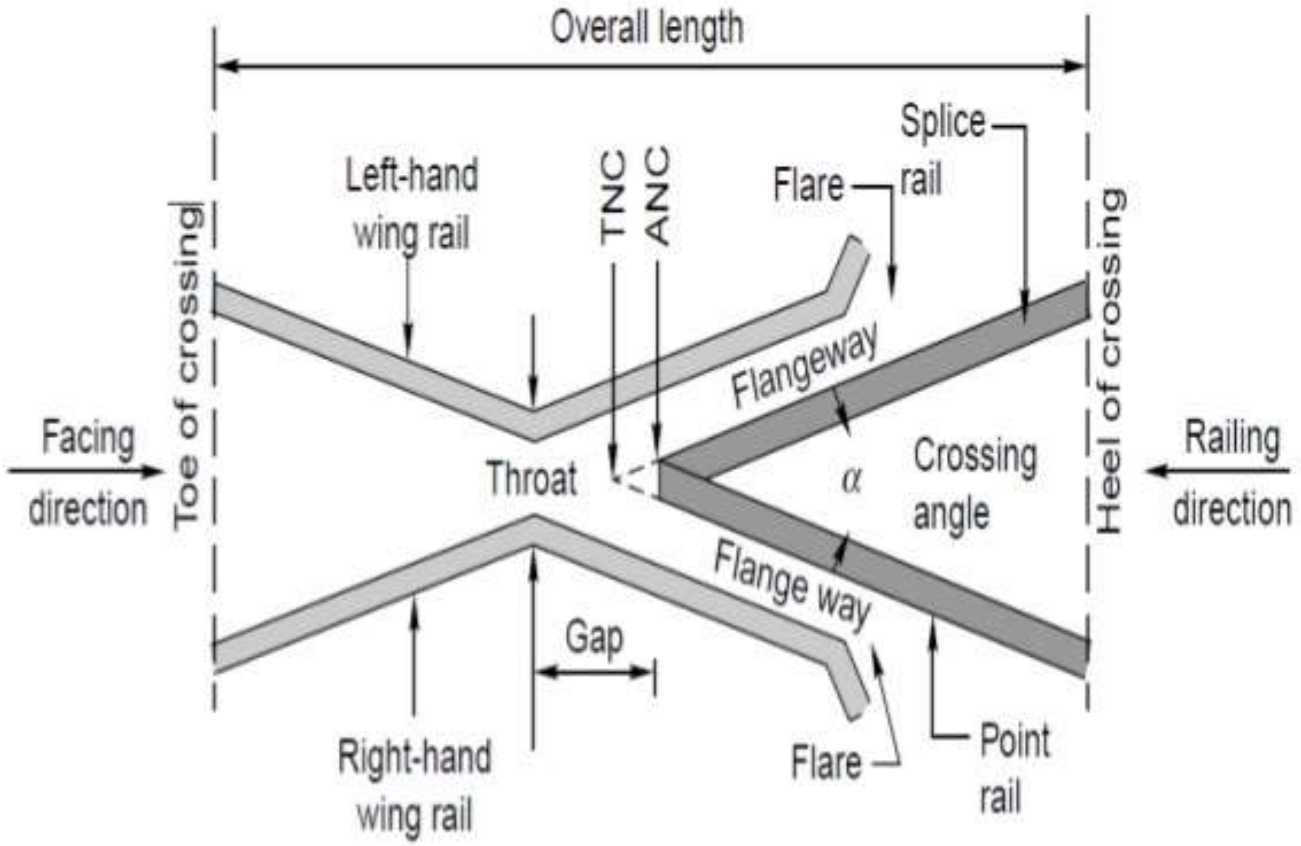
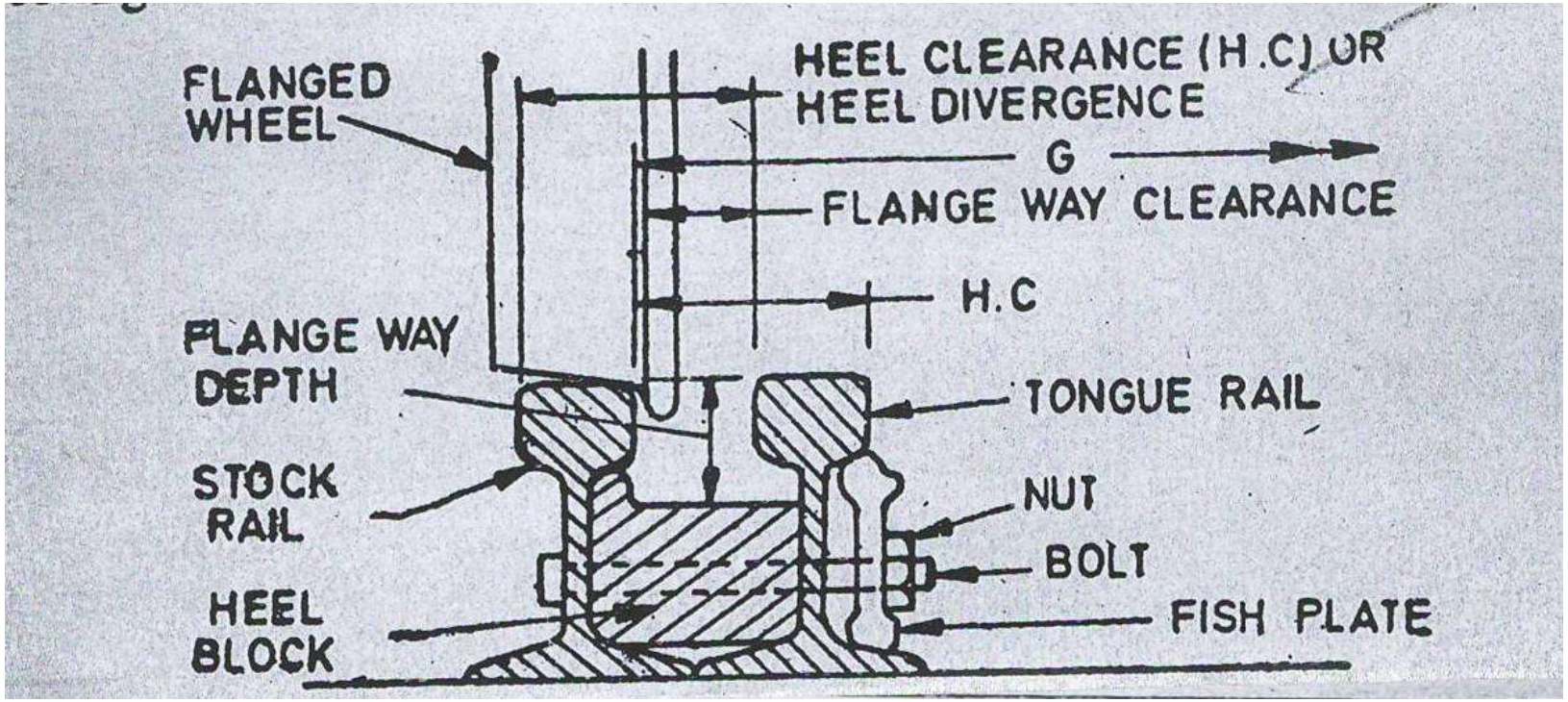


Fig. 14.5 Details of a crossing

Heel Clearance or Heel Divergence:
Clear distance between running faces of stock rail and tongue rail



For BG…….13.3 to 13.7 cm
For MG……. 11.7 to 12.1 cm
For NG……. 9.8 cm