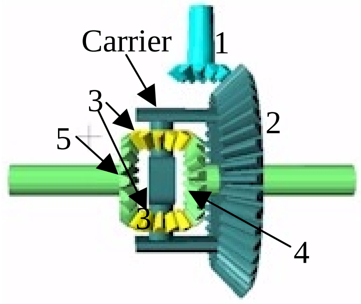

Bevel gear 1 on the end of drive shaft meshes with gear 2 to which carrier is attached. Gear 2 and the carrier (arm) are free to turn relative to right axle which gear 4 is fastened. Gears 3 are mounted on studs of carriers. When the vehicle is running straight ahead and transmitting the same torque to each axle, gears 3 are stationary with respect to the carrier, and gears 4 and 5 and the axles to which they are fastened rotate at the same speed as 3. With one driving wheel stationary and other off the ground, the one off the ground will rotate at twice the speed of gear 2; that is, the train acts as a cyclic train with either 4 or 5 fixed. In rounding turns, gears 4 and 5 and the axles to which they are fastened are free to rotate at different angular velocities as determined by the paths of the driving wheels. In other words, while driven by 2, gears 4 and 5 are free to rotate at different angular velocities. The average of the angular velocities of 4 and 5 must, however, be equal to the angular velocity of 2.

$$\frac{\omega_4 - \omega_{arm}}{\omega_5 - \omega_{arm}} = \frac{\omega_4}{\omega_3}\frac{\omega_3}{\omega_5}$$

Since the arm (carrier) is fixed to gear 2,

$$\omega_{arm} = \omega_2$$

$$\frac{\omega_4 - \omega_2}{\omega_5 - \omega_2} = -\frac{N_5}{N_4} = -1$$

$$\omega_4 - \omega_2 = -\omega_5 + \omega_2$$

$$\omega_4 + \omega_5 = 2\omega_2$$

$$\frac{\omega_4 + \omega_5}{2} = \omega_2$$

Note that the number of teeth of gears are: N_1=12, N_2=45, N_3=13, N_4=18, N_5=18