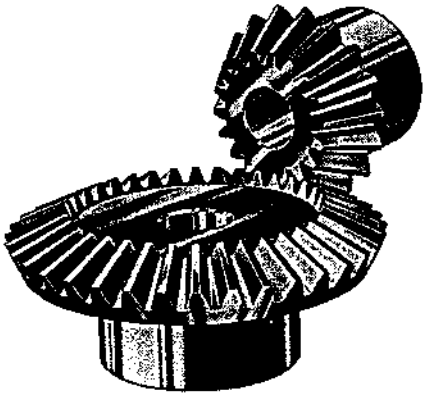
Helical Gears—Quieter than spur gears—thrust loads increase.

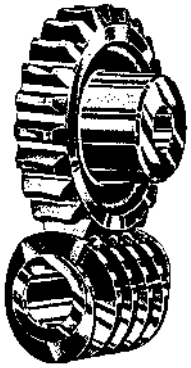
Bevel Gears-Used to transmit motion between intersecting shafts



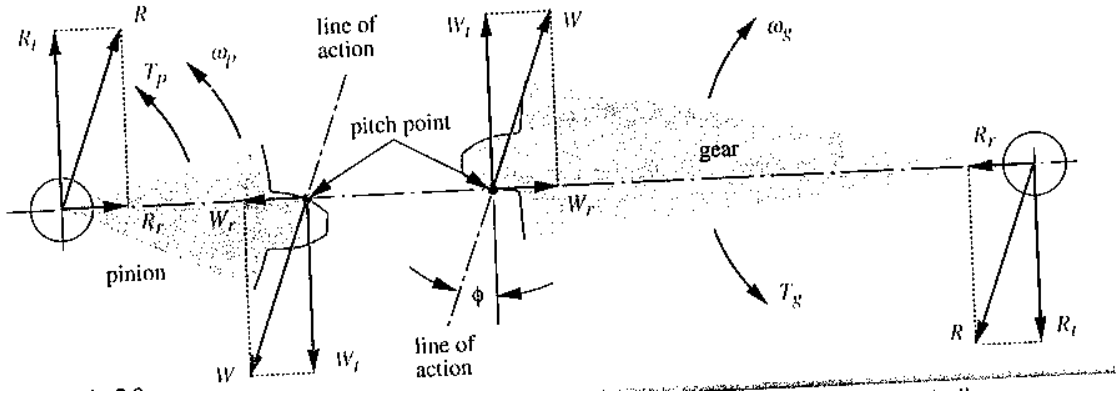
Straight bevel gear

Spiral Bevel Gear

Worm Gears—large speed reductions



Forces on Spur Gears



Radial Component = Wr
Tangential Component = Wt

$$W_t = \frac{T_p}{r_p} = \frac{2T_p P_p}{N_p}$$

$$W_r = W_t \tan(f)$$

$$W = \frac{W_t}{\cos(f)}$$

Example

Determine the torques and transmitted loads on the gear teeth in a 3-gear train containing a pinion, an idler gear, and a gear. Find the gear diameters and the mean and alternating components of transmitted load on each gear.

The pinion shaft gives 20 hp at 2500 RPM. The train ratio is 3.5:1

The pinion has 14 teeth, a 25° pressure angle, and Pg = 6. The idler has 17 teeth. The idler is between the pinion and the gear.