

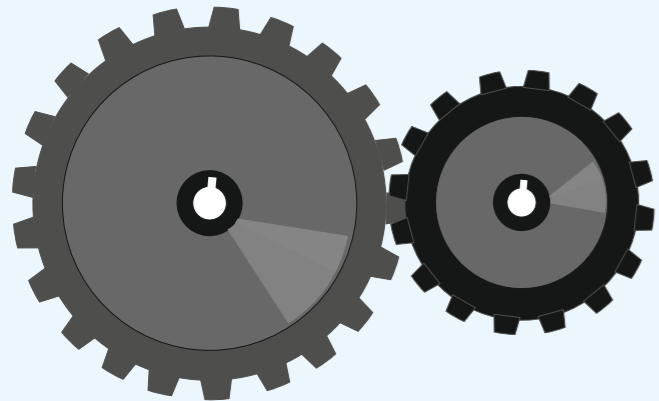
GEARS AND GEAR SYSTEMS

WHAT IS A GEAR TRAIN?

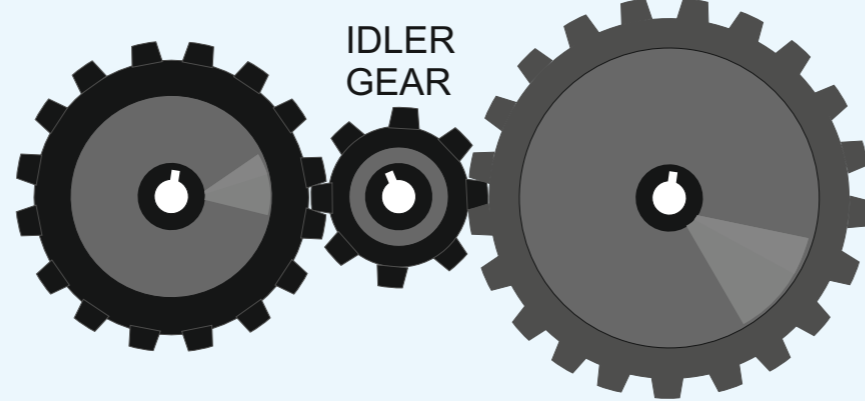
A gear train is a mechanical system, composed of at least two gears. Gear trains can increase torque, reduce or increase speed and change the direction of rotation. They are used in machines and even power tools.

An idler gear is positioned between two other gears to transmit motion from one to the other. Its main function is to change the direction of rotation.

SIMPLE GEAR TRAIN

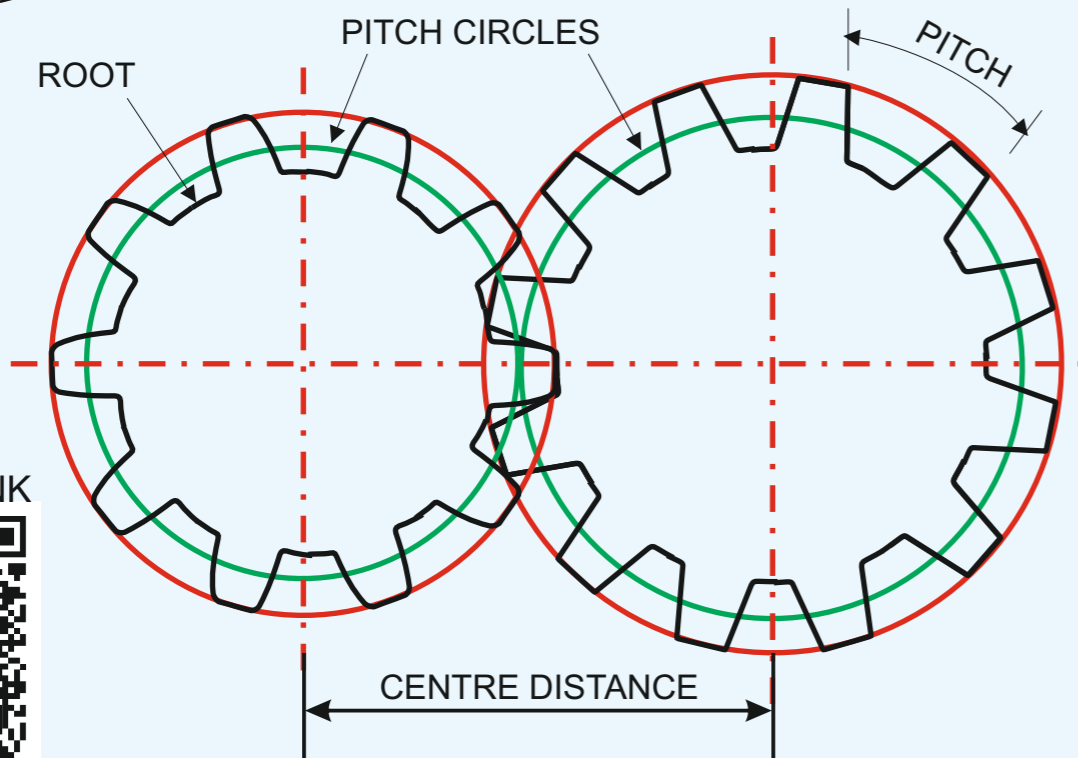
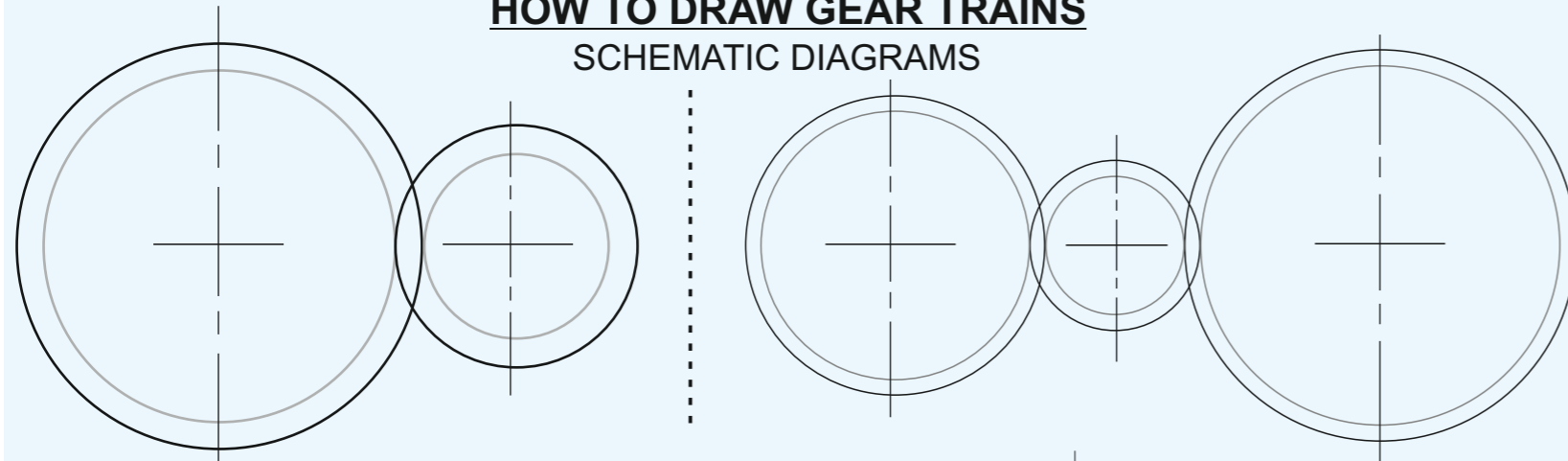


SIMPLE GEAR TRAIN WITH IDLER GEAR



HOW TO DRAW GEAR TRAINS

SCHEMATIC DIAGRAMS

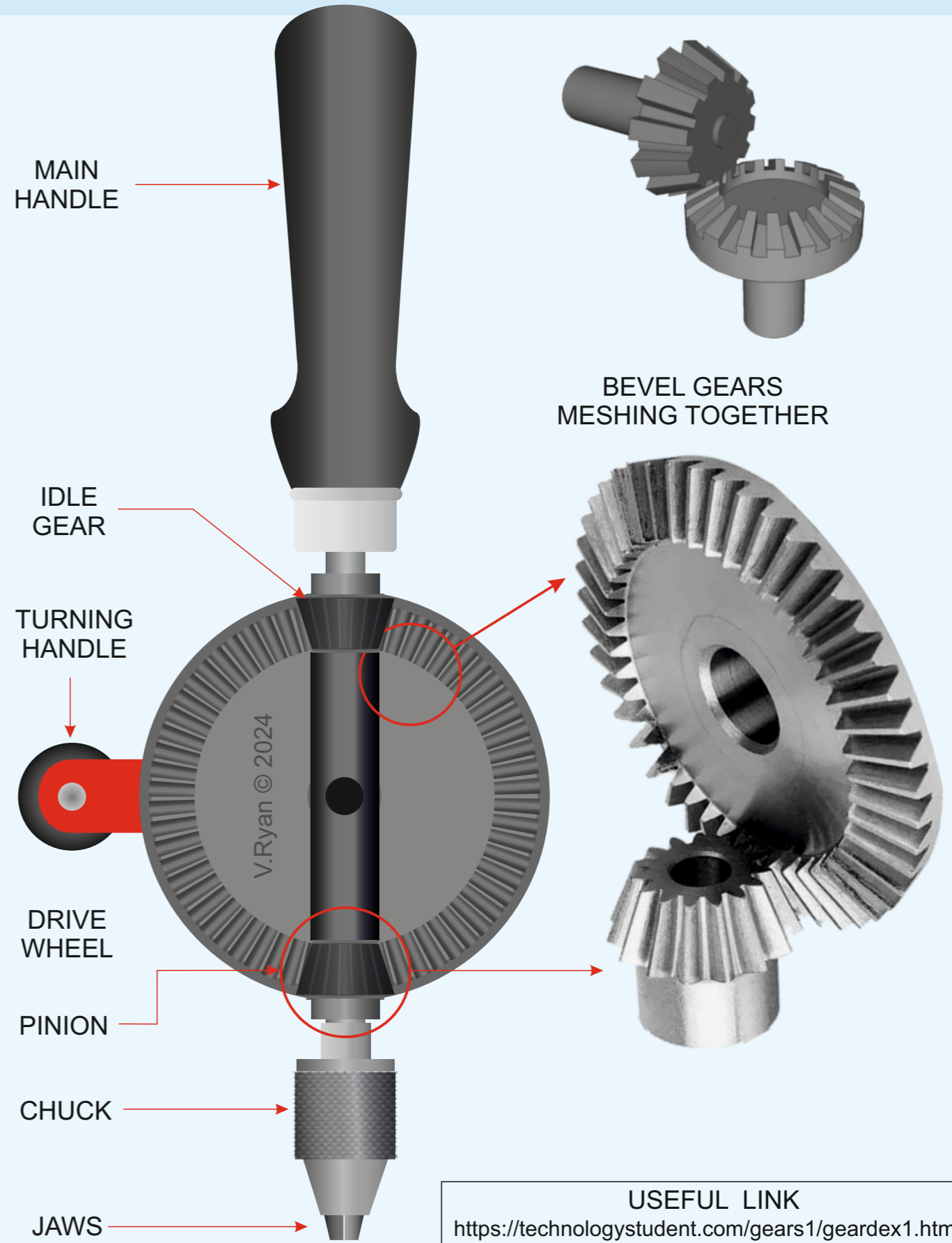


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BEVEL GEARS

Bevel gears change the direction of drive in a gear system by 90 degrees. A good example is seen in a hand drill. As the handle of the drill is turned in a vertical direction, the bevel gears change the rotation of the chuck to a horizontal rotation.



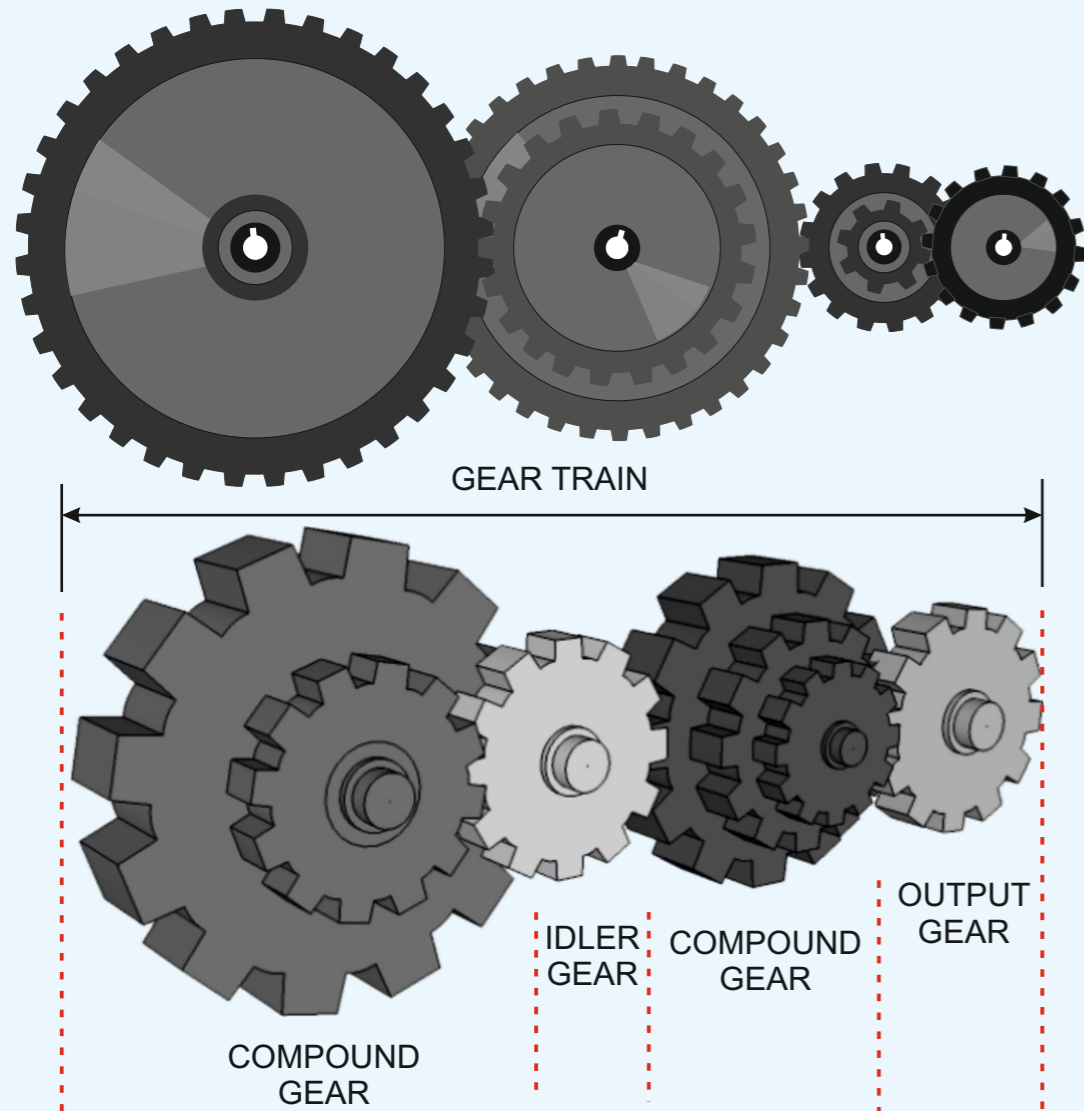
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<https://technologystudent.com/gears1/gardex1.htm>

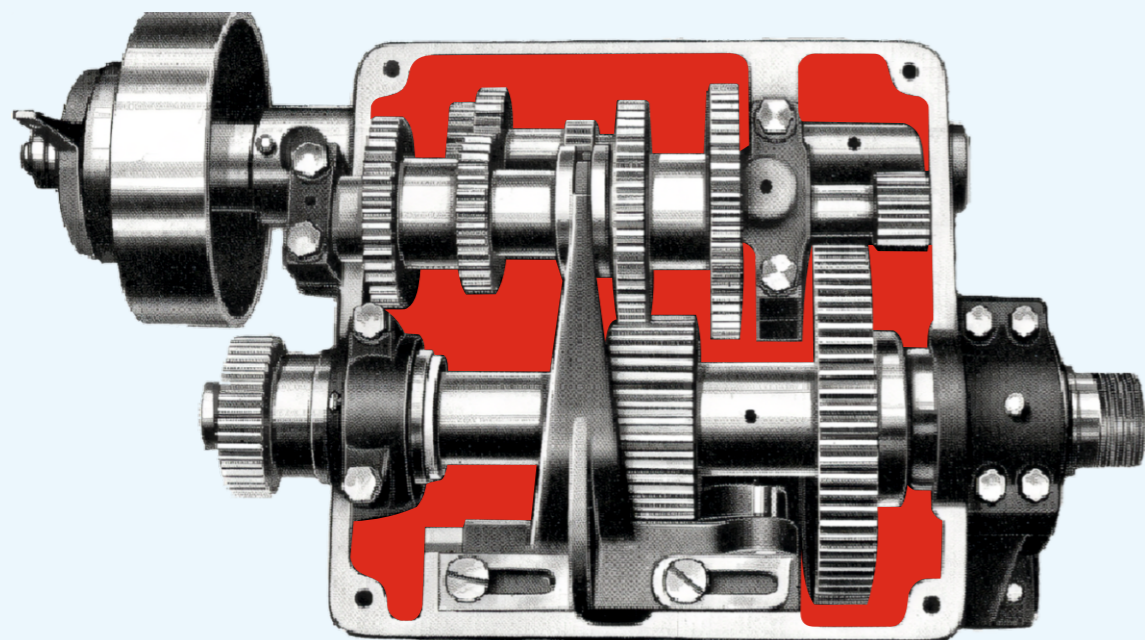
GEARS AND GEAR SYSTEMS

COMPOUND GEARS

Compound gears are multiple gears 'stacked' together, to achieve different gear ratios. They are used to transmit power and motion between different shafts. A good example is the gear system inside the headstock of a centre lathe

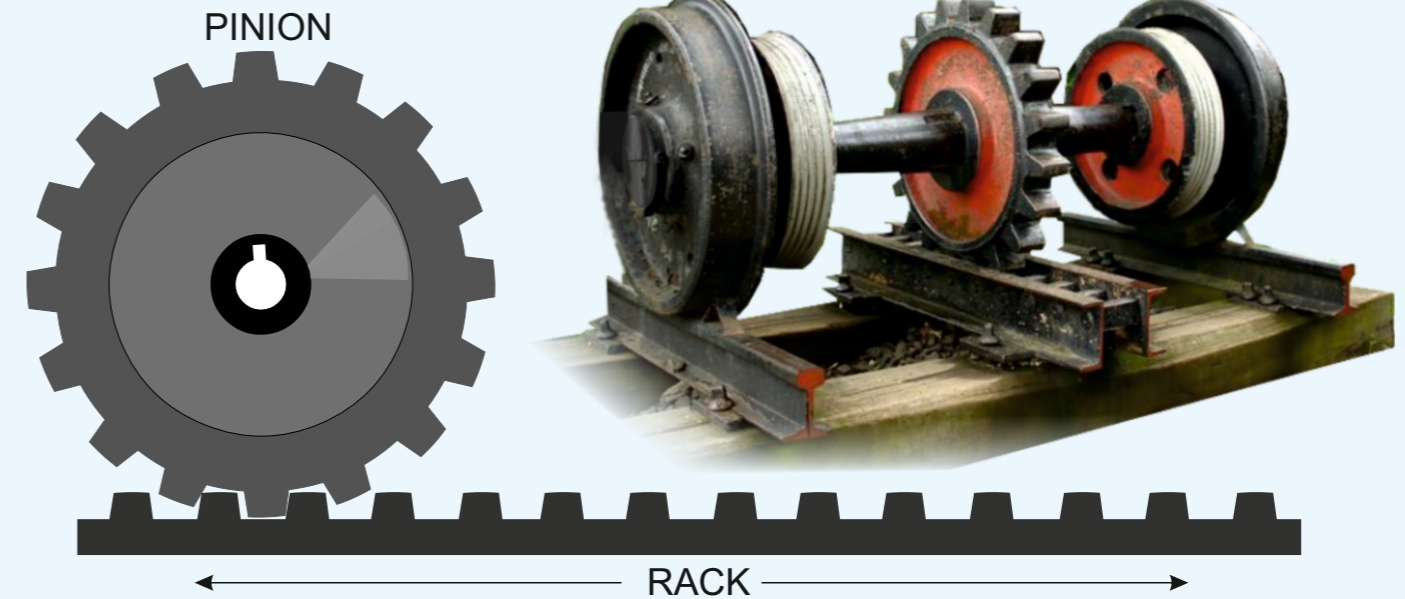


GEAR SYSTEM - CENTRE LATHE HEADSTOCK



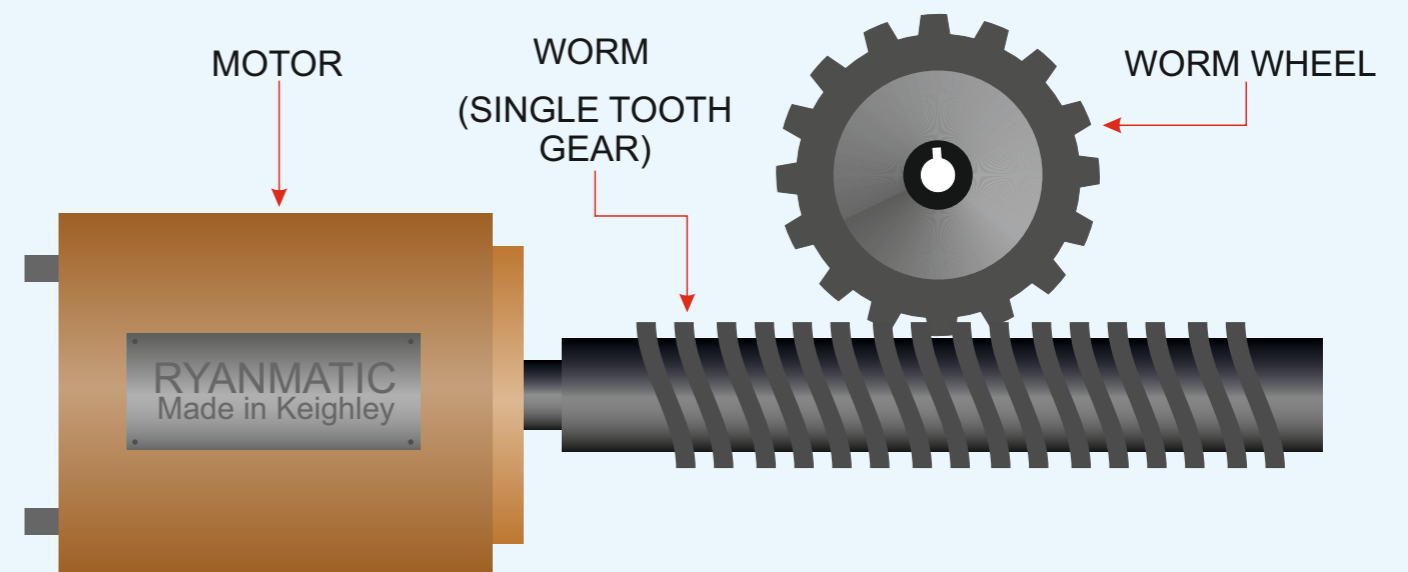
RACK AND PINION GEARS

A 'rack and pinion' gear system is composed of two gears. The 'pinion' is the round gear and the 'rack' is flat. The teeth machined into the 'rack', mesh with the teeth of the pinion gear. A mountain railway uses this technology to pull a train up steep inclines.



WORM GEARS

The arrangement of gears seen below is called a worm and worm wheel. The worm has one helical tooth that looks like a screw thread. The worm wheel is a gear wheel with helical teeth, cut at an angle matching the worm. The worm always drives the worm wheel round, it is never the opposite way round, because the system tends to lock and jam.



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