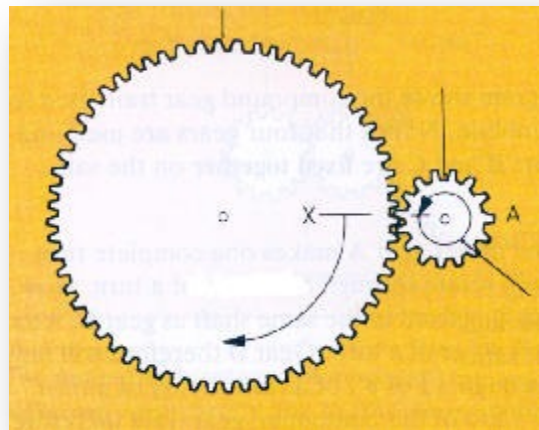


# Gears - Velocity Ratio

The diagram below shows a simple gear train where A is the driver gear, and B is the driven gear. When A makes one complete turn, its 15 teeth move past point X on the diagram. Since the gears are meshed (and cannot slip), 15 teeth on the driven gear also pass point X. For each complete turn of the driver gear therefore, the driven gear only rotates through a quarter of a turn. Now, since the driven gear only rotates through a quarter of a turn for each complete turn of the driver gear, the driven gear will only rotate at a quarter of the speed (or velocity) of the driver gear.



The **velocity ratio** of the above system therefore (and gear ratio) is 4:1.

In other words, the driver gear revolves four times to make the driven gear revolve once.

To calculate the Velocity Ratio of a gear train.

$VR = \text{Number of teeth on DRIVEN gear} \div \text{Number of teeth on DRIVER gear}.$



Number of teeth on driven gear = 8

Number of teeth on driver gear = 24

$$RV = 8 / 24 = 1:3$$

In **Compound** gear systems to work out the overall Velocity ratio you have to know the velocity ratio of each pair of gears in the system and then multiply them together.

