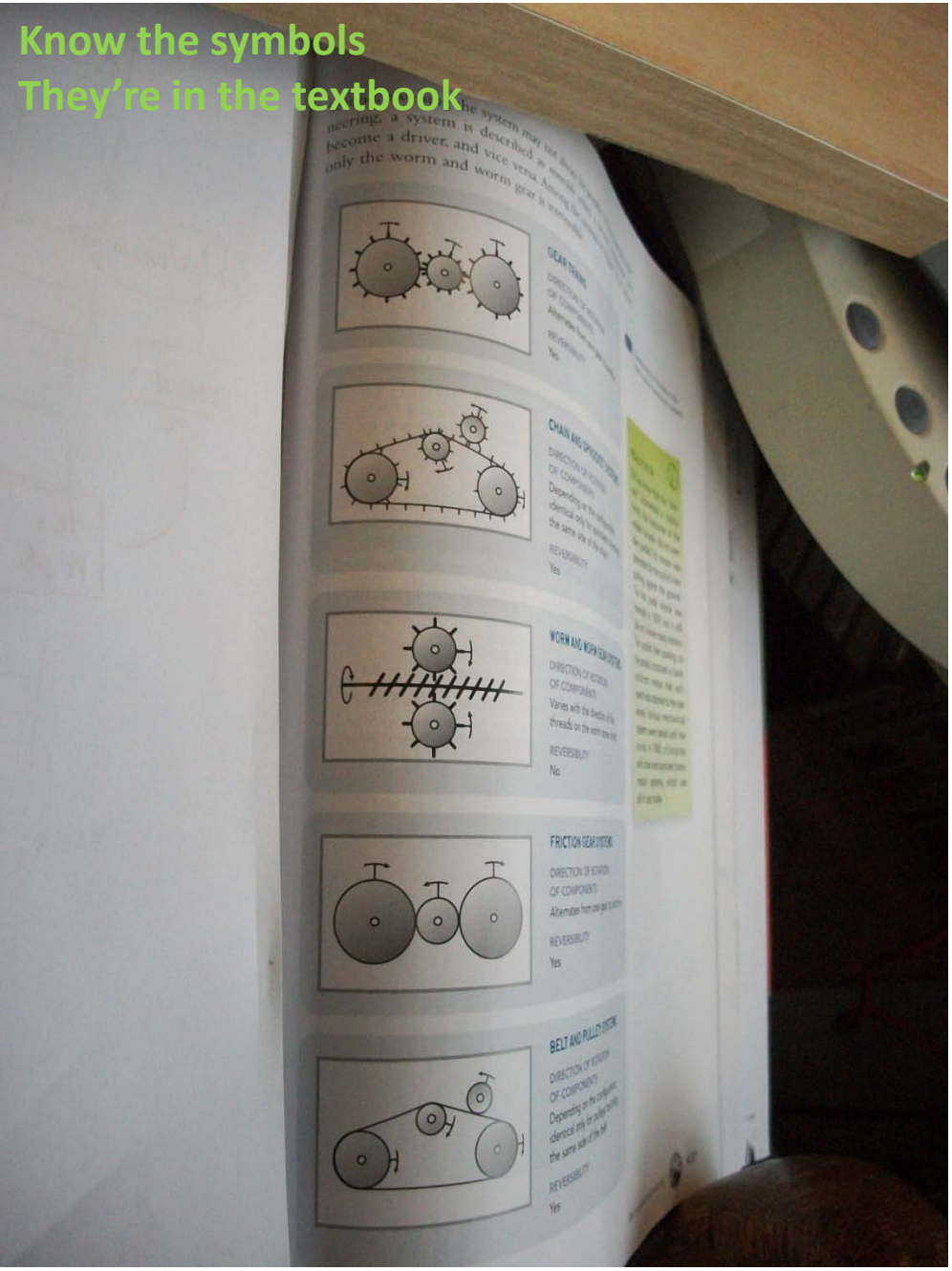
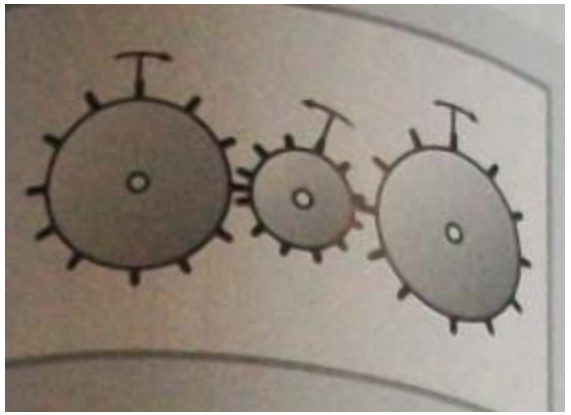
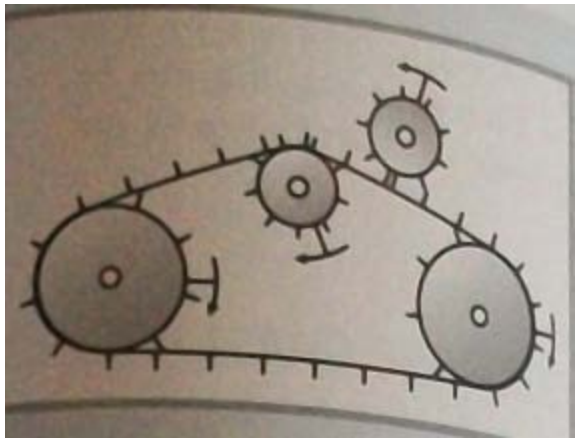
Gear Systems

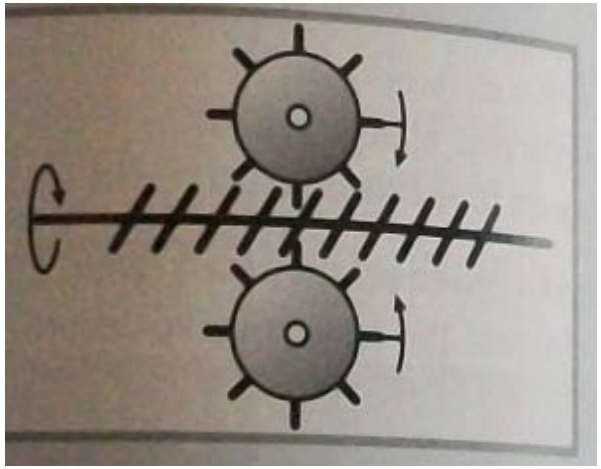
1. Gear Trains
2. Chain-Sprocket systems
3. Worm and Worm-gear Systems
4. Friction-Gear (toothless)Systems
5. Belt and Pulley Systems

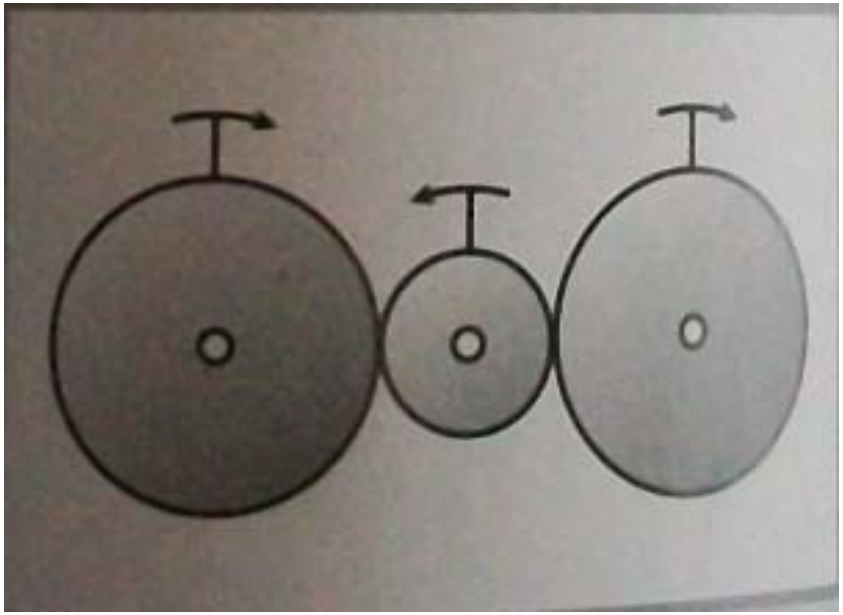
Know the symbols
They're in the textbook

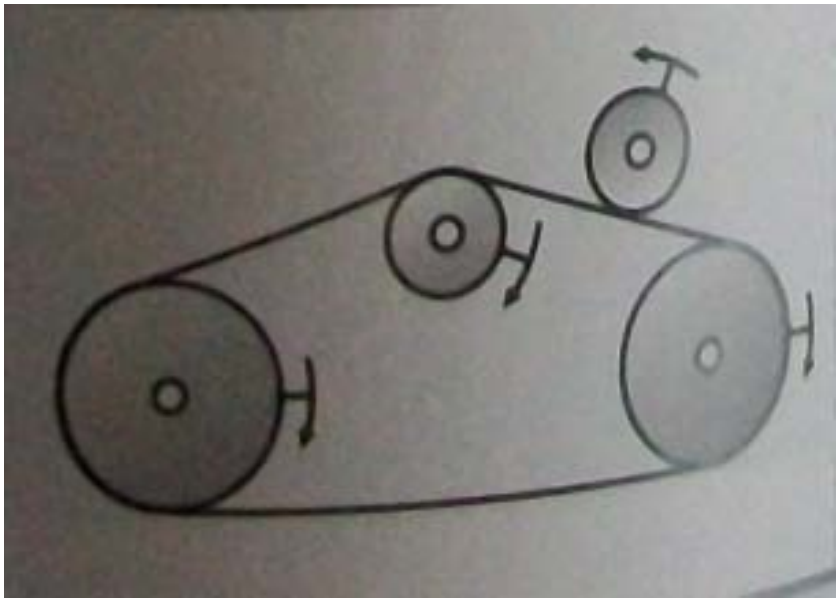






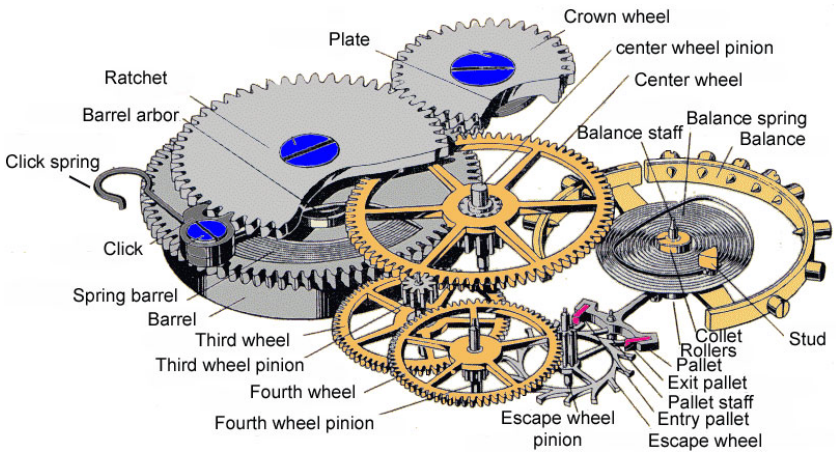




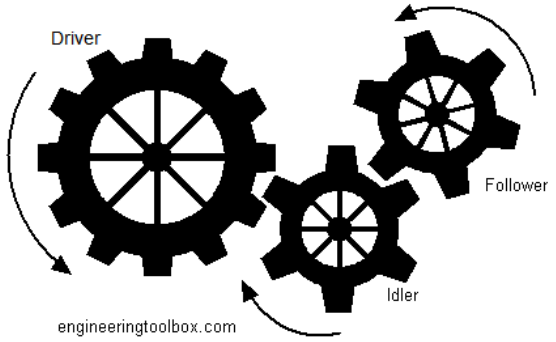


1. Gear Trains: two or more toothed gears that mesh with each other; includes gear boxes that we've already studied.

Example 1: Try to identify where these would be found.

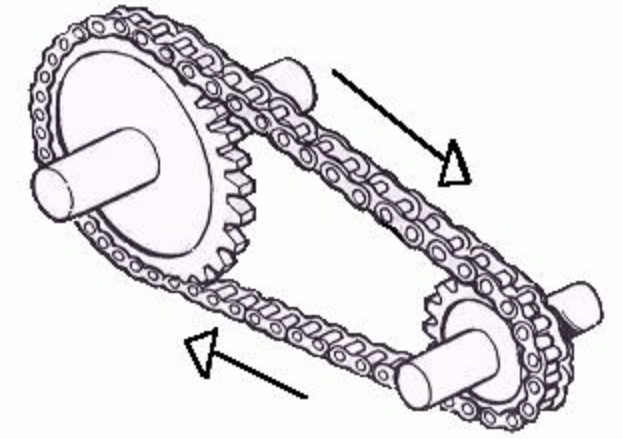


Example 2: Calculate the velocity ratio for the following. Note that the "driver" gear is the input.



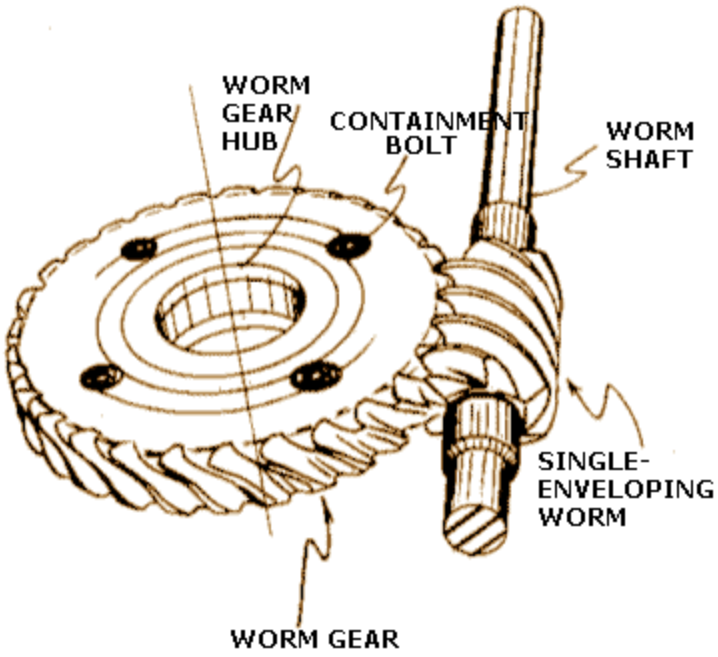
2. Chain-Sprocket Systems: toothed gears connected by a chain

Example 1: What advantage does this system have over a gear train?



3. Worm& Worm-gear System:

The input gear is a screw-like “worm”, and the output is one or more toothed gears known as worm-gears. It’s not reversible.



Example 1: Which part do you think turns very easily?

Example 2: If the velocity ratio is low, what can be said about the mechanical ratio?

4. Friction-Gear (toothless)Systems: like a gear train without the teeth

Example 1: The two wheels('gears") are made out of iron.
What makes them stick together?

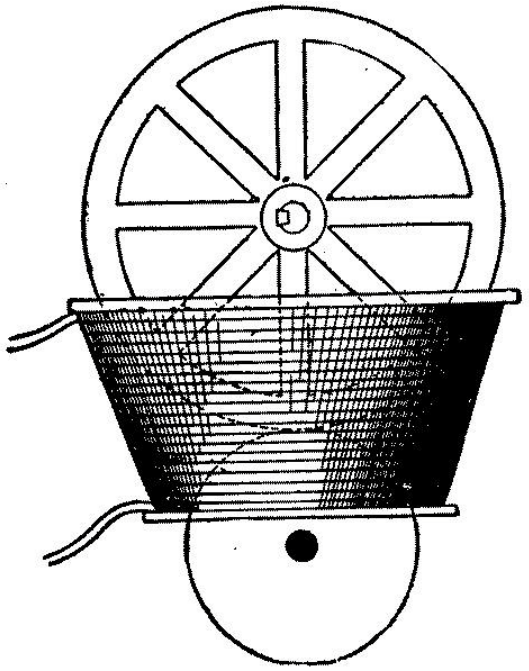
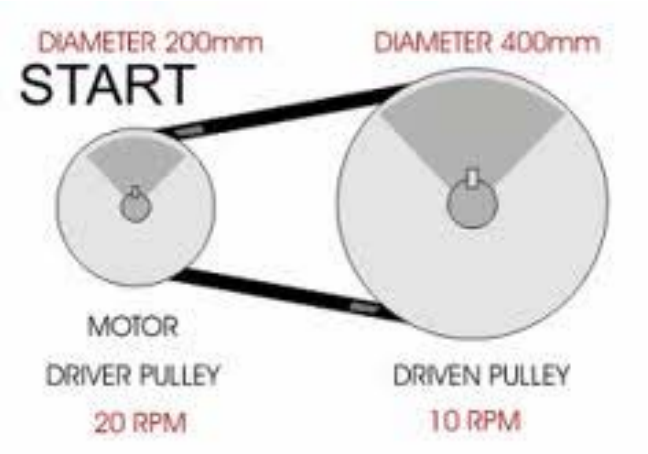


Fig. 190. MAGNETIC FRICTION GEAR.

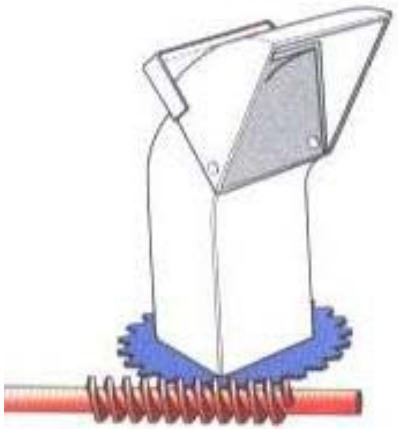
5. Belt and Pulley Systems: has pulleys that include grooves that allow the belt to fit.

Example 1: What makes this system different from a chain-sprocket system?



Example 2: What is the mechanical ratio of this system? Velocity ratio?

More Examples

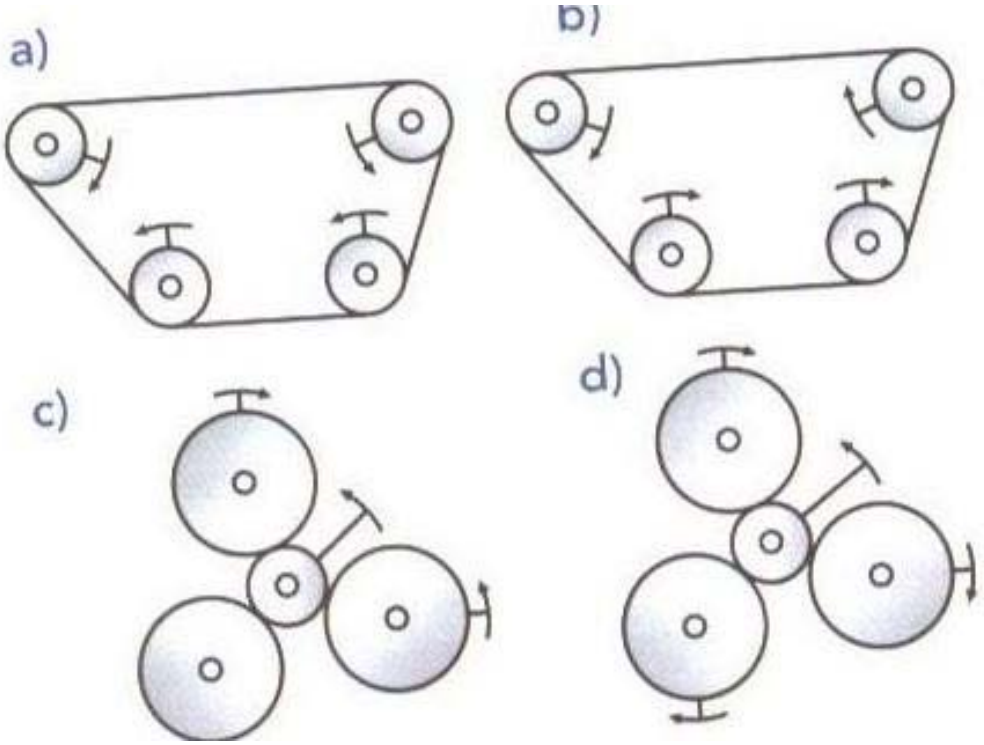


1. a) This is part of a snow blower.
What type of gear system is this?

b) Name the input. (what type of gear is this?)

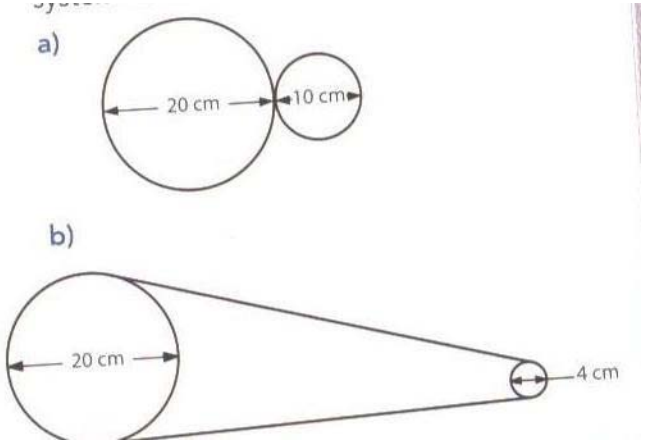
c) If you try to turn the chute manually,
why is that a bad idea?

2. Which systems show the real motion?



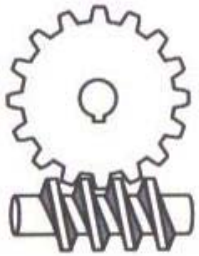
3. a) Calculate the velocity(speed) ratio if the larger one is the input.

b) What kind of systems are these, assuming no teeth on the gears?



4. Look at the two worm and worm gear systems below.

a)



b)

In which system will the rotational speed be more greatly reduced? Explain your answer.

5. In the chain and sprocket system below, the rotational speed of the driver sprocket is 60 revolutions per minute. Based on the information provided by the illustration, calculate the rotational speed of the other sprocket. Express your answer in revolutions per minute.