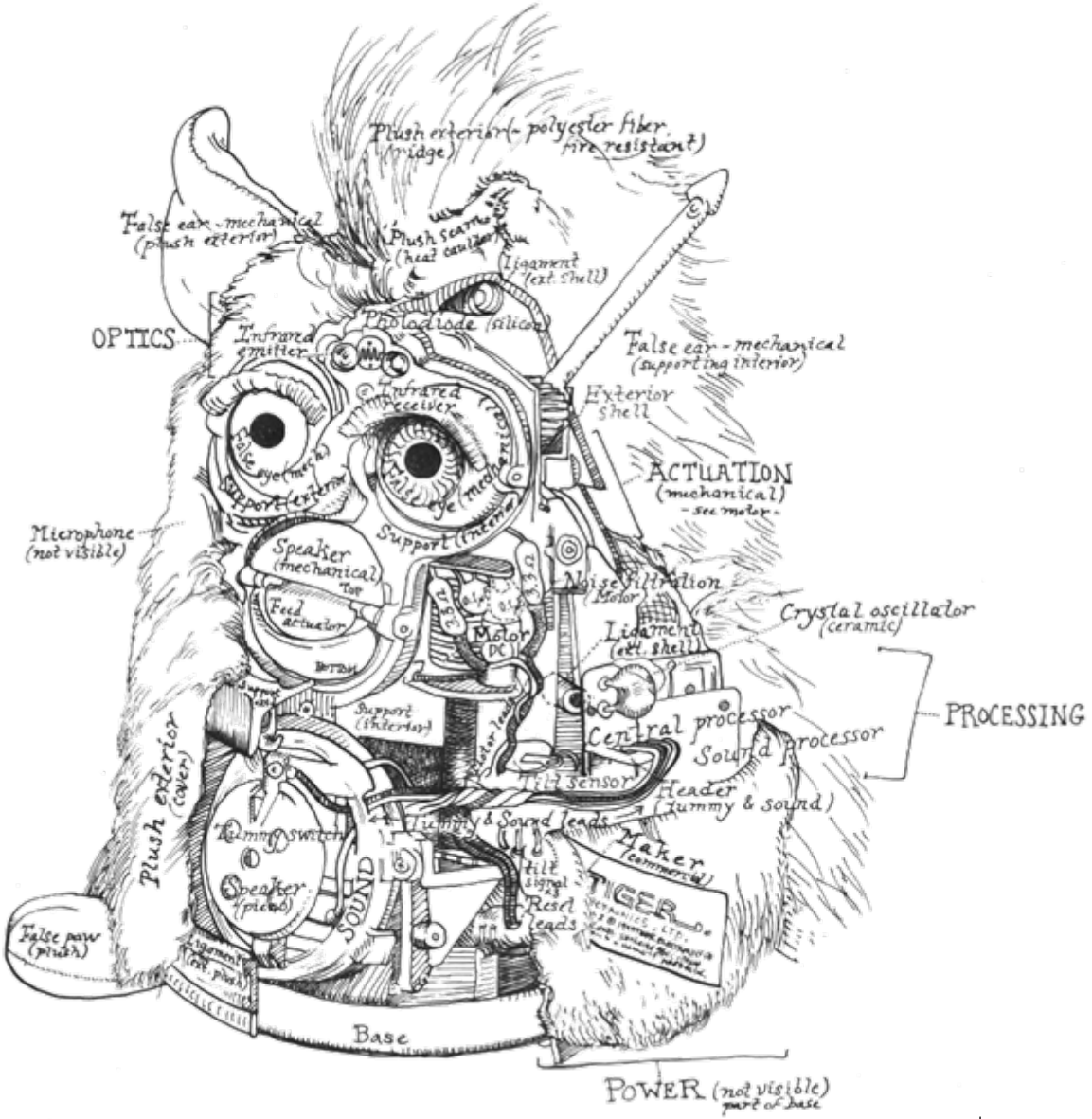
week
09

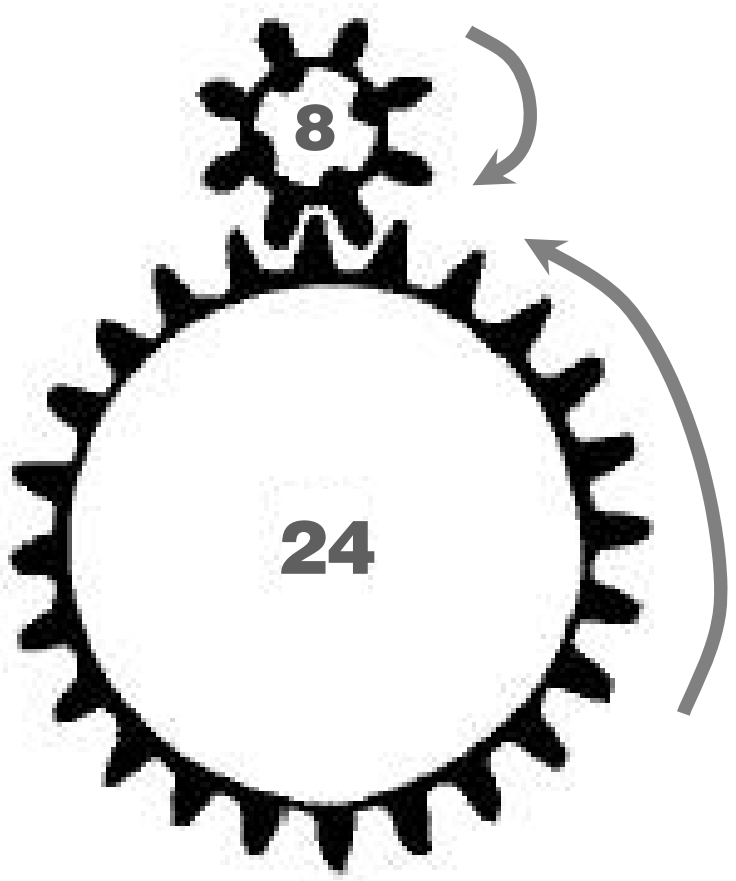
Simple Mechanics

Translating rotational motion into other types of motion

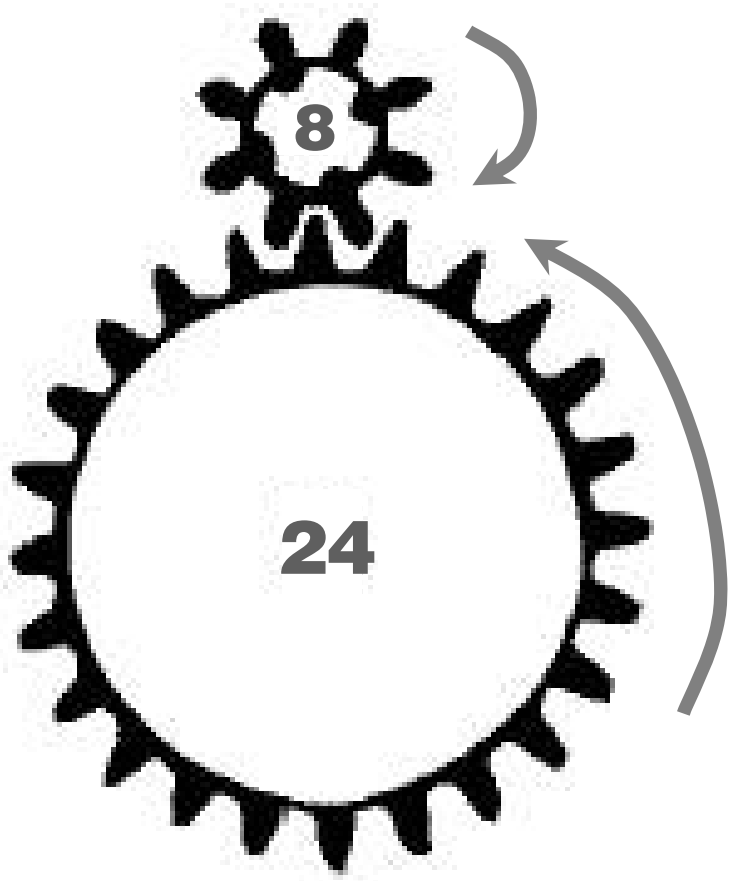

Plush exterior (- polyester fiber, fire resistant?)
(bridge)
False ear - mechanical (plush exterior)
Plush seams (heat cauterized)
Ligament (ext. shell)
OPTICS
Photodiode (silicon)
Infrared emitter
Infrared receiver
False ear - mechanical (supporting interior)
Exterior shell
ACTUATION (mechanical) - see motor -
Microphone (not visible)
Speaker (mechanical)
Feed actuator
Motor DC
Noise filtration
Crystal oscillator (ceramic)
Ligament (ext. shell)
PROCESSING
Central processor
Sound processor
Support (interior)
Plush exterior (cover)
Tilt sensor
Header (tummy & sound)
Tummy & Sound leads
Tummy switch
Maker (commercial)
Speaker (piezo)
SOUND
Tilt signal leads
TIGER
False paw (plush)
Base
POWER (not visible) part of base

Gears

3 to 1 ratio



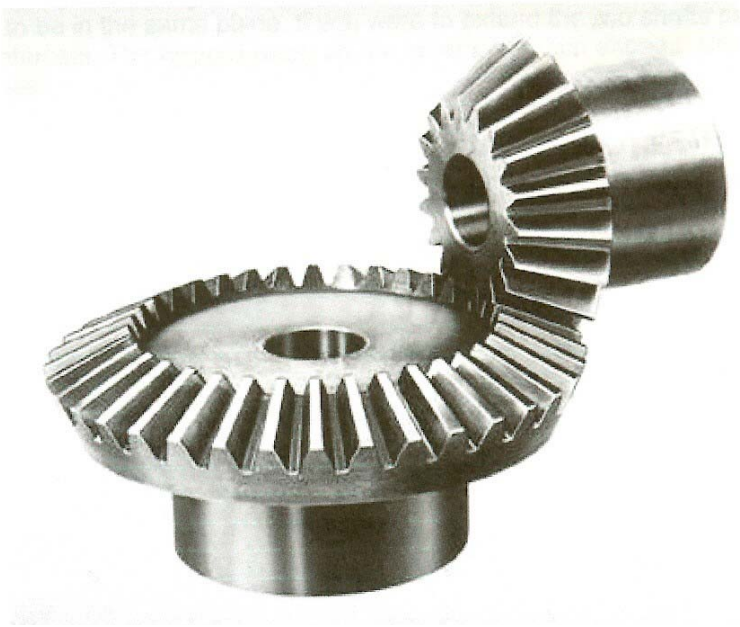
3 to 1 ratio



1/3 of the speed

3 times the torque

Bevel gear



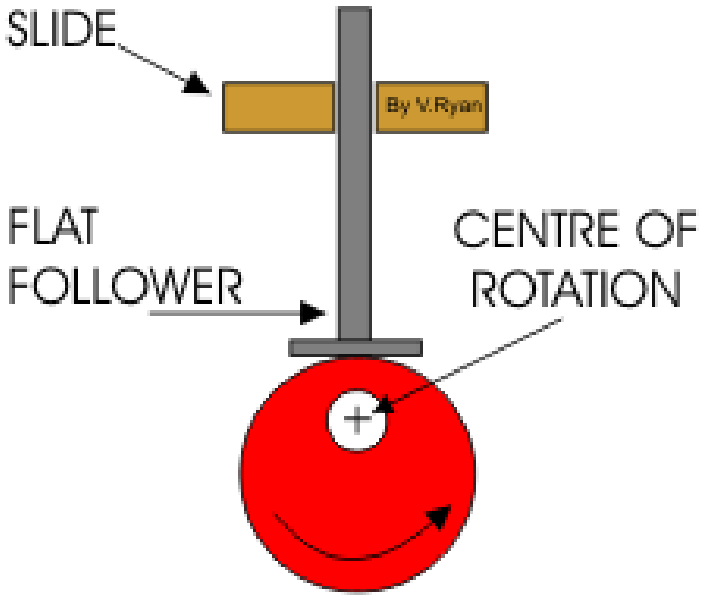
Shifts the axis of motion by 90 degrees.

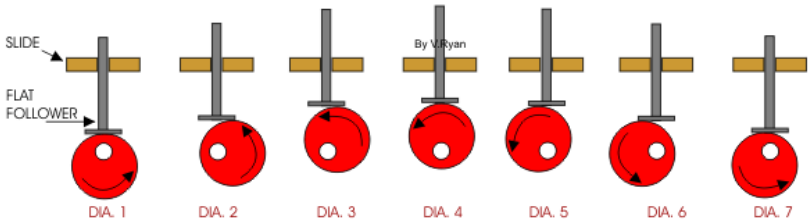
Worm gear

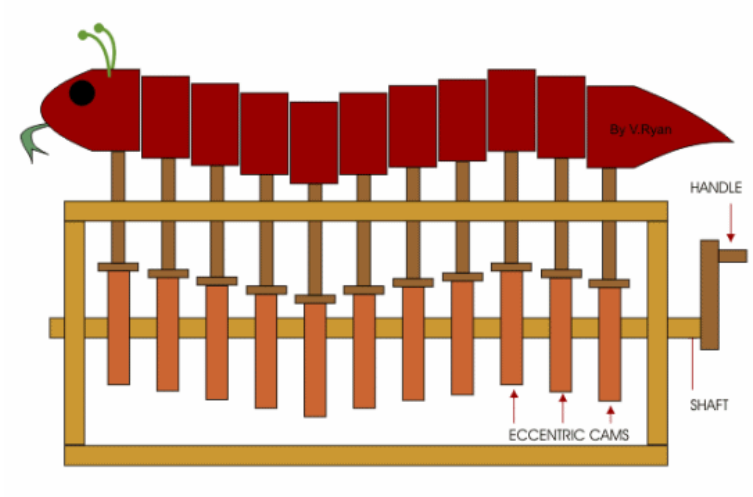
Shifts the axis of motion by 90 degrees. High gear ratios.

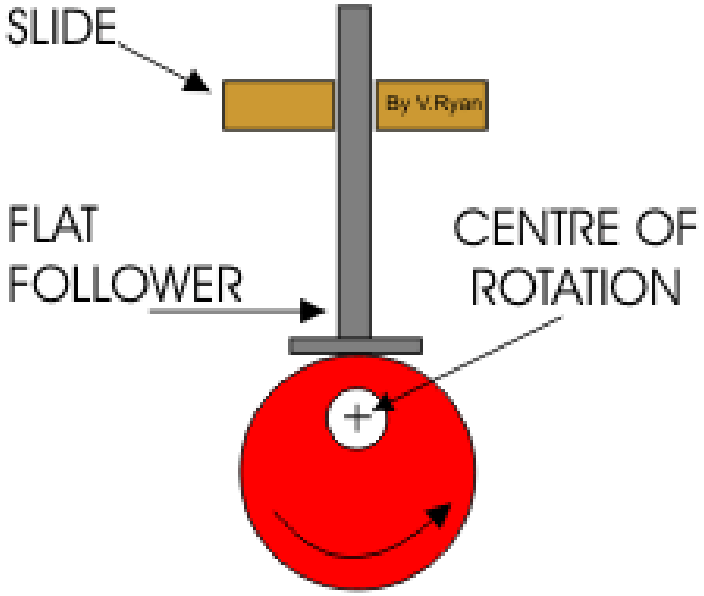
Rack-and-pinion

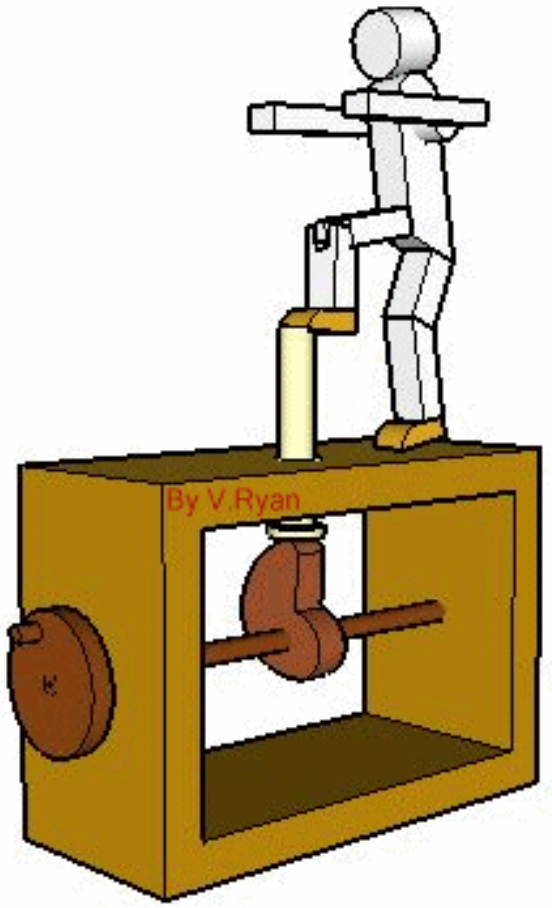
Cams



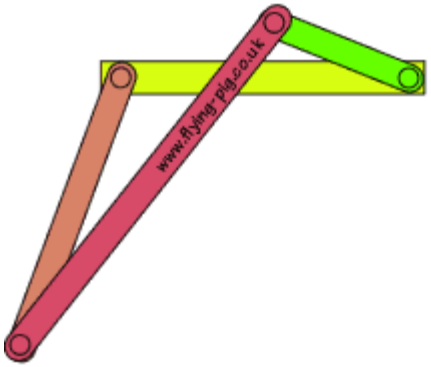

SLIDE
FLAT
FOLLOWER
By V.Ryan
DIA. 1
DIA. 2
DIA. 3
DIA. 4
DIA. 5
DIA. 6
DIA. 7

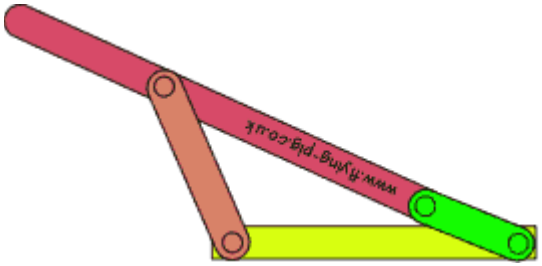

By V.Ryan
HANDLE
SHAFT
ECCENTRIC CAMS

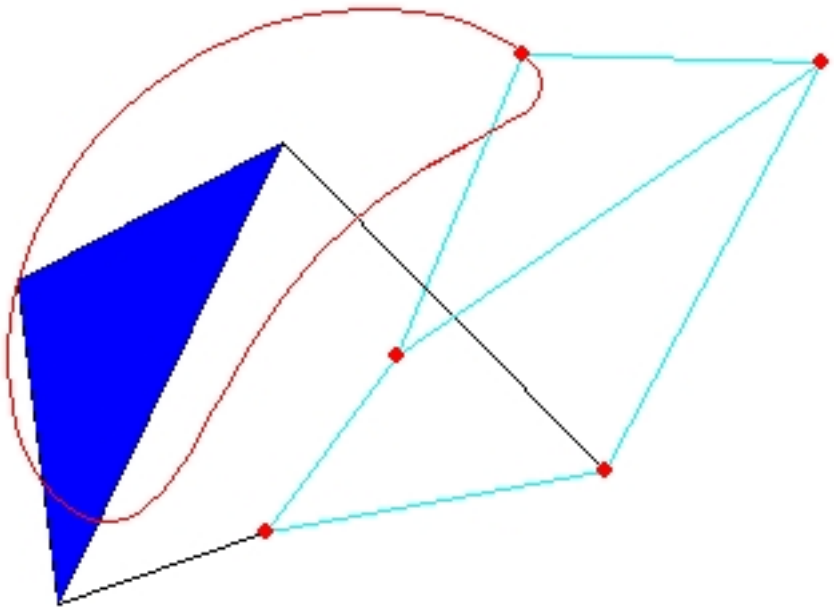

SLIDE
By V.Ryan
FLAT
FOLLOWER
CENTRE OF
ROTATION


By V.Ryan

Linkages







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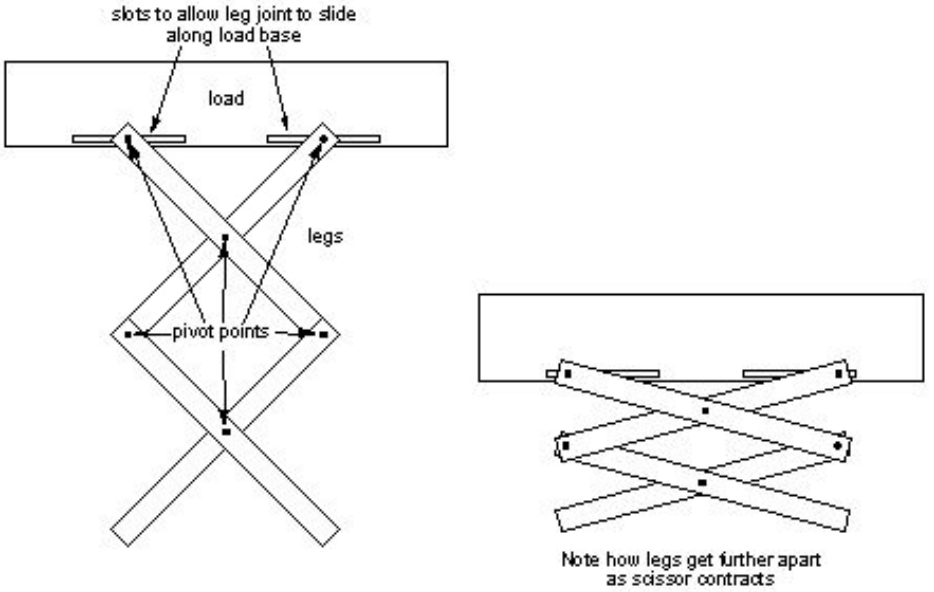
Scissor linkages

http://images.rermag.com/files/148/JLG_ProFit_Scissor.jpg

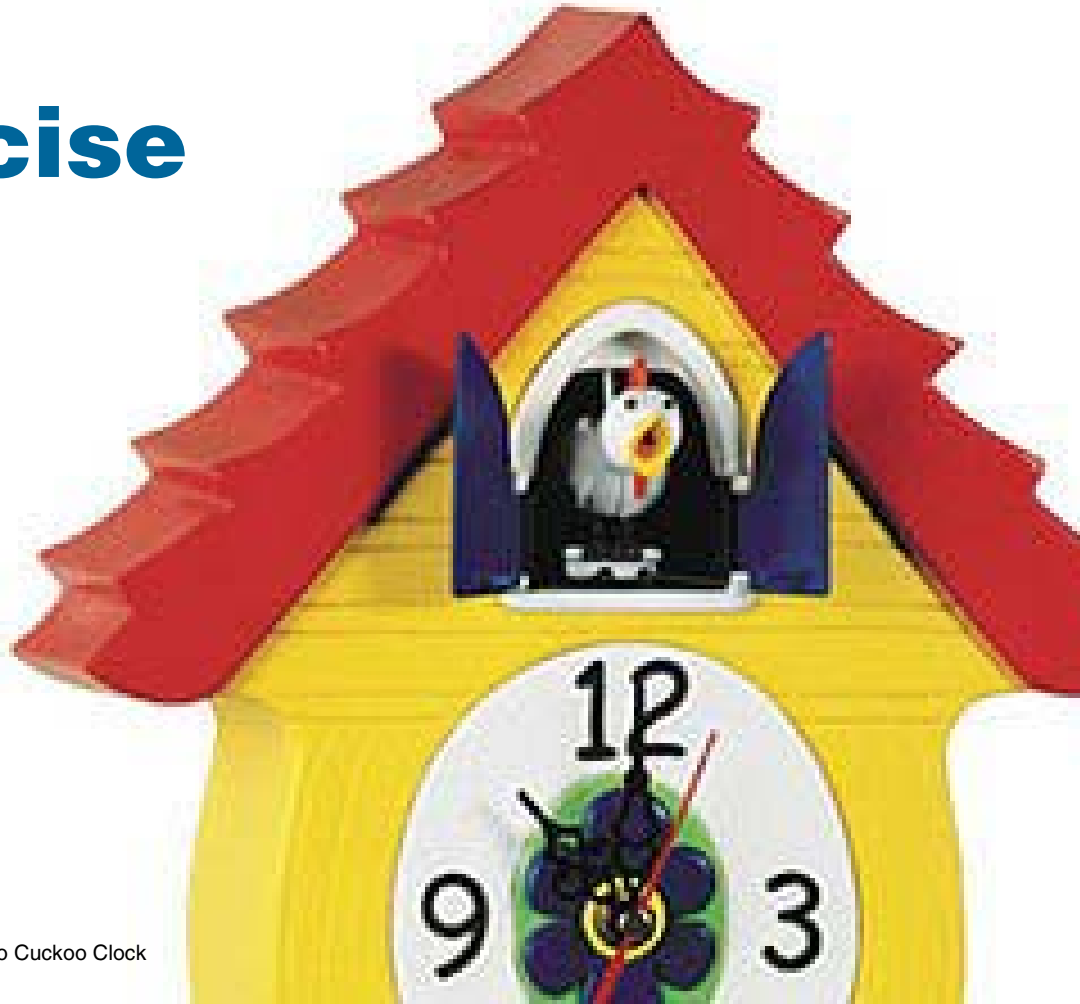


http://www.tigoe.net/pcomp/machines2.shtml

The Piston (Rod and Crank)

Converts rotary motion to back-and-forth linear motion.

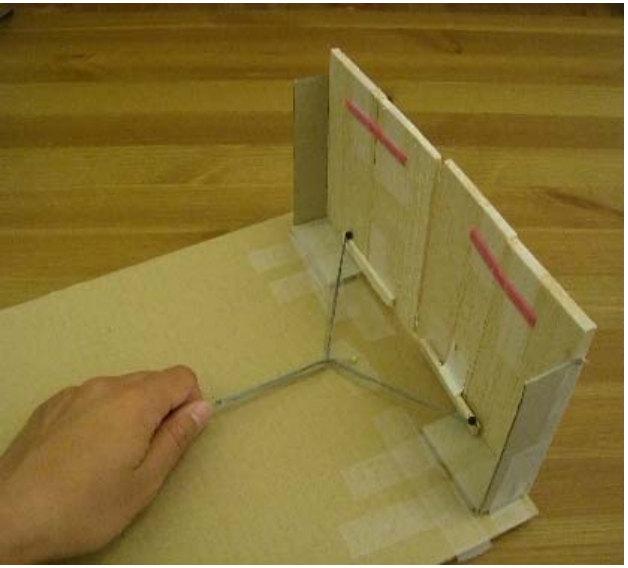
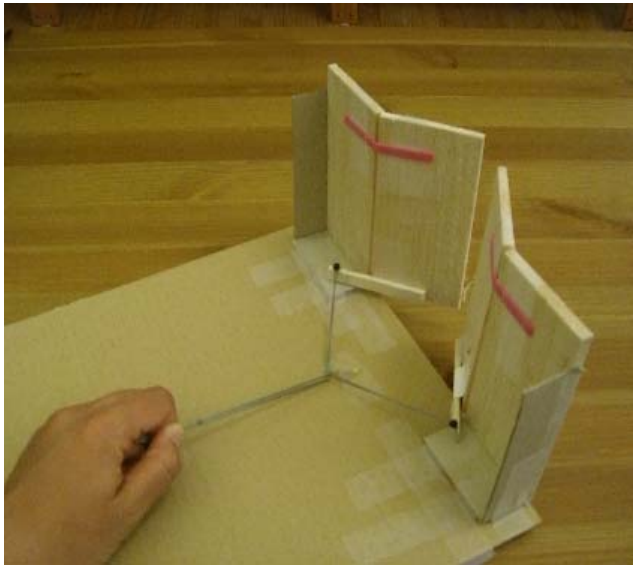
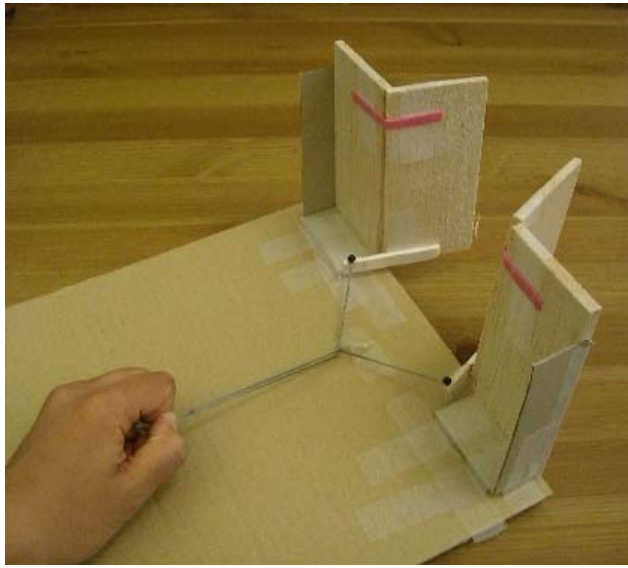
In-Class Exercise

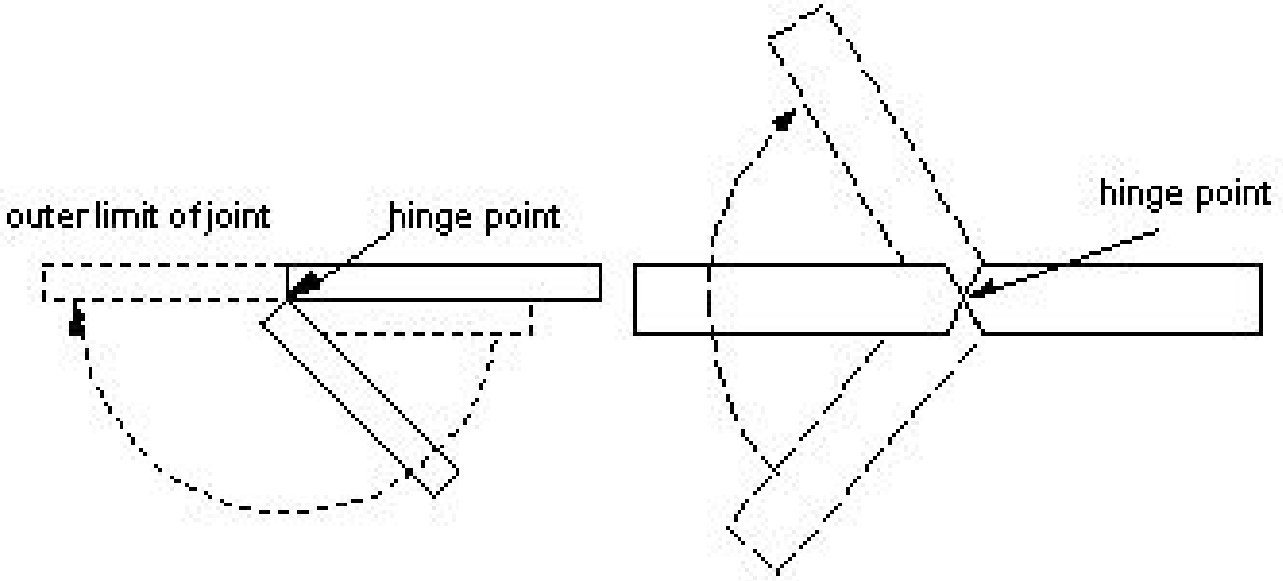


CluckCoo Cuckoo Clock

In Class Exercise

1. Create the door
2. Create the bird
3. Put them together

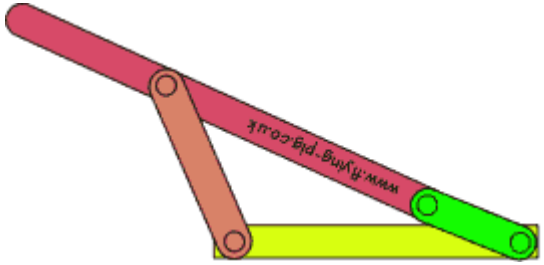


http://www.tigoe.net/pcomp/machines2.shtml

In Class Exercise

1. Create the door
2. Create the bird
3. Put them together


www.flying-pig.co.uk


www.flying-pig.co.uk

In Class Exercise

1. Create the door
2. Create the bird
3. **Put them together**

Once you get the mechanics to work, try to control it from Arduino.

Explore and get the mechanics to work first before trying to make it work with your DC motors or servo motors.

Homework

Post descriptions and photos (and/or video) of your “Cuckoo Clock” mechanics on the course website.

Thanks!