15-394 Intermediate Rapid Prototyping

Gears and Linkages

Fall 2017

Instructor: Dave Touretzky

Types of Gears

Spur Gears

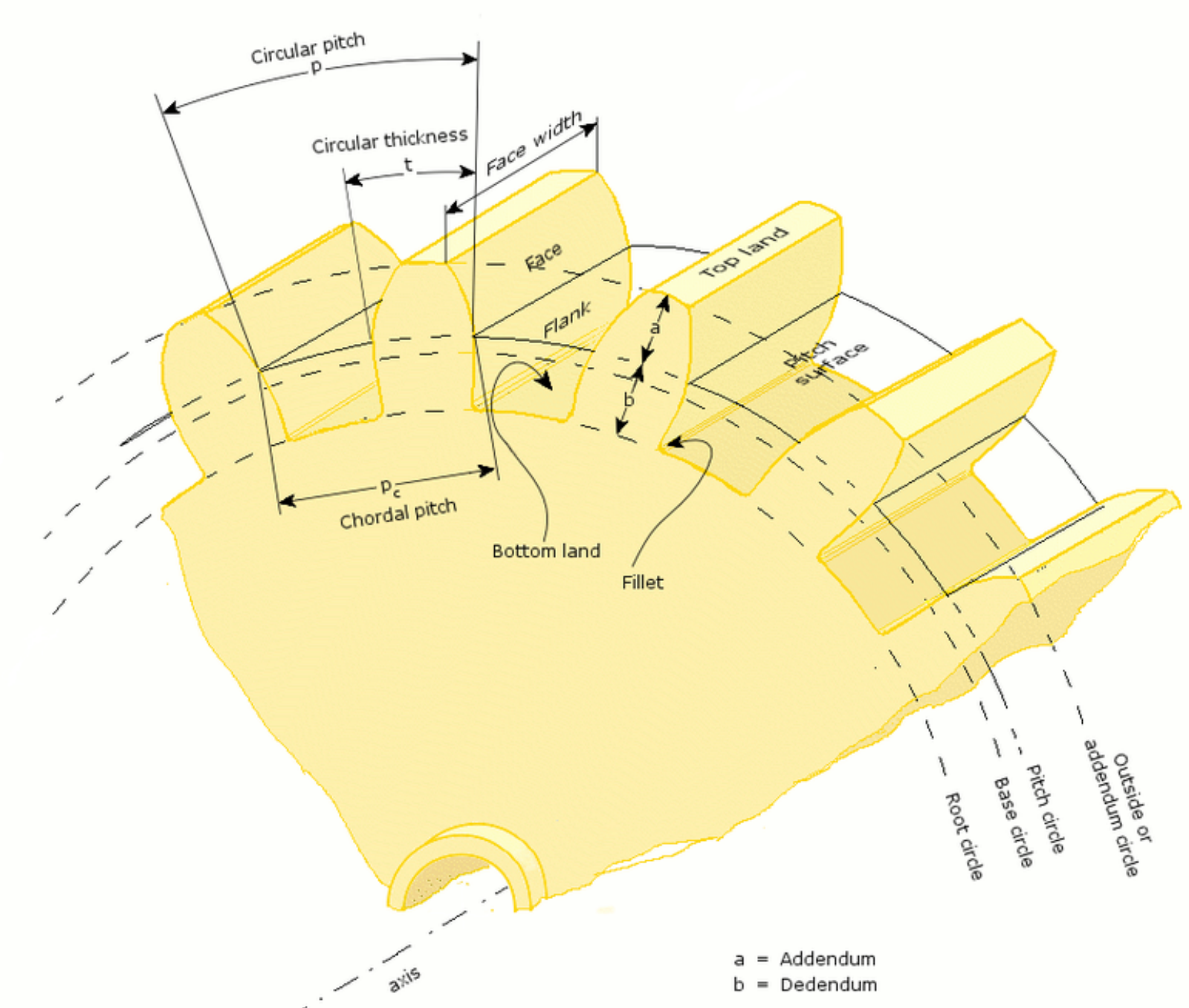
Crown Gear

Bevel Gears

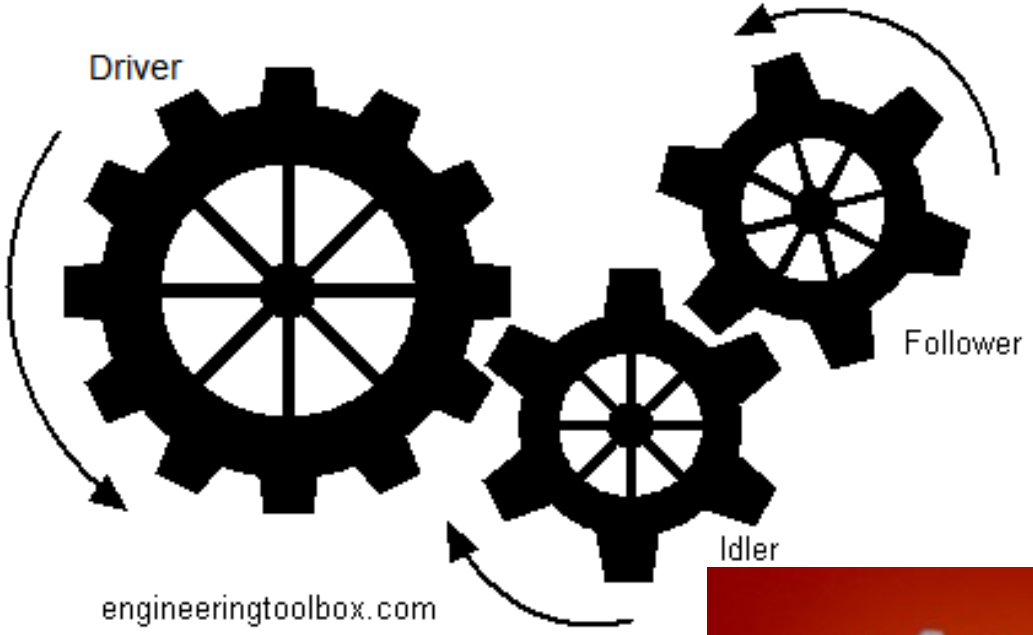
Helical Gears

Worm Gear

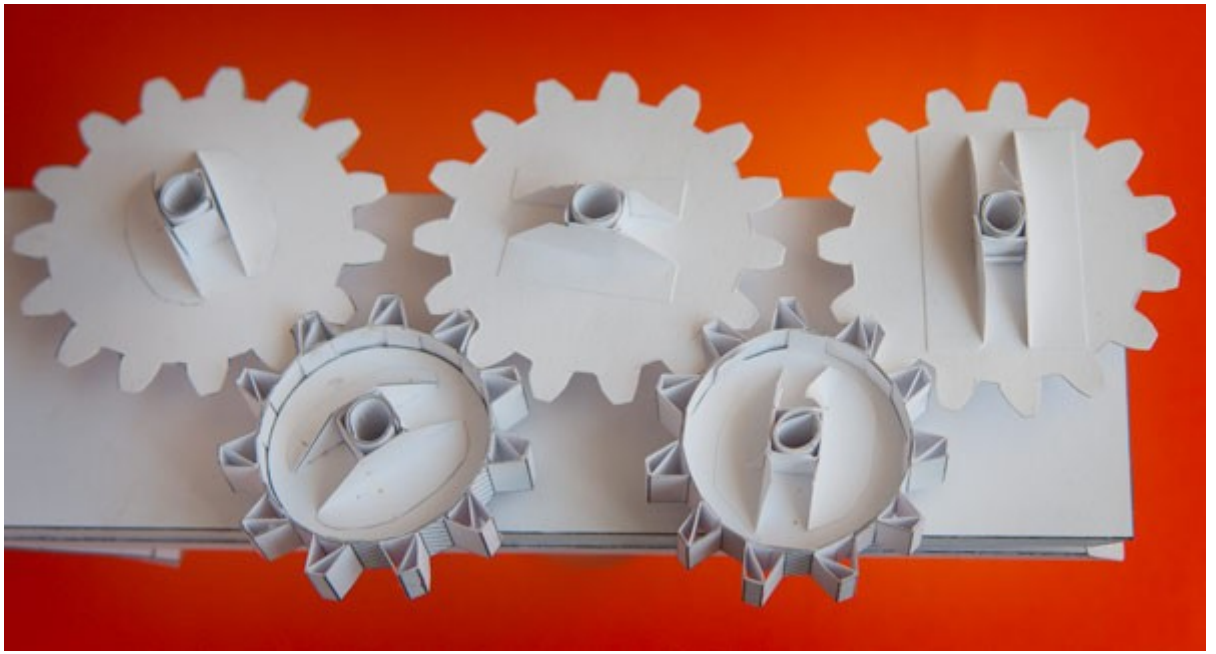
Spur Gear Design Parameters



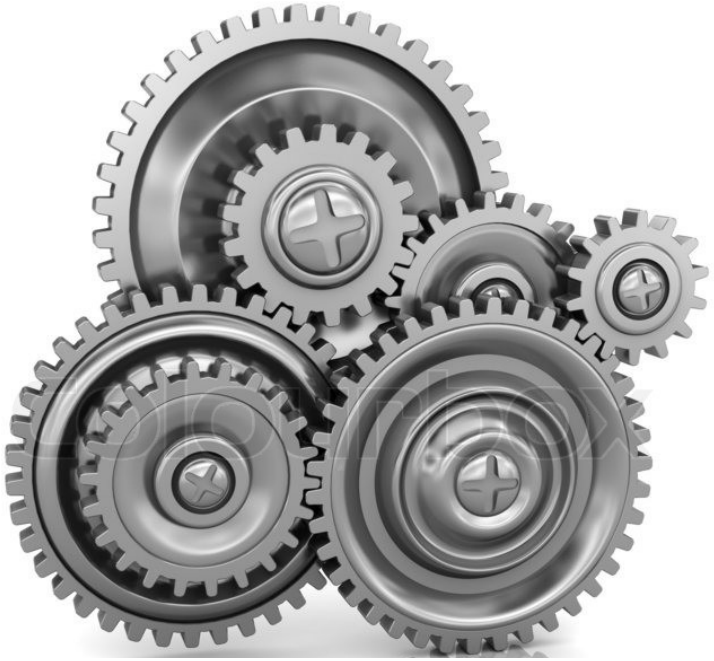
Gear Train

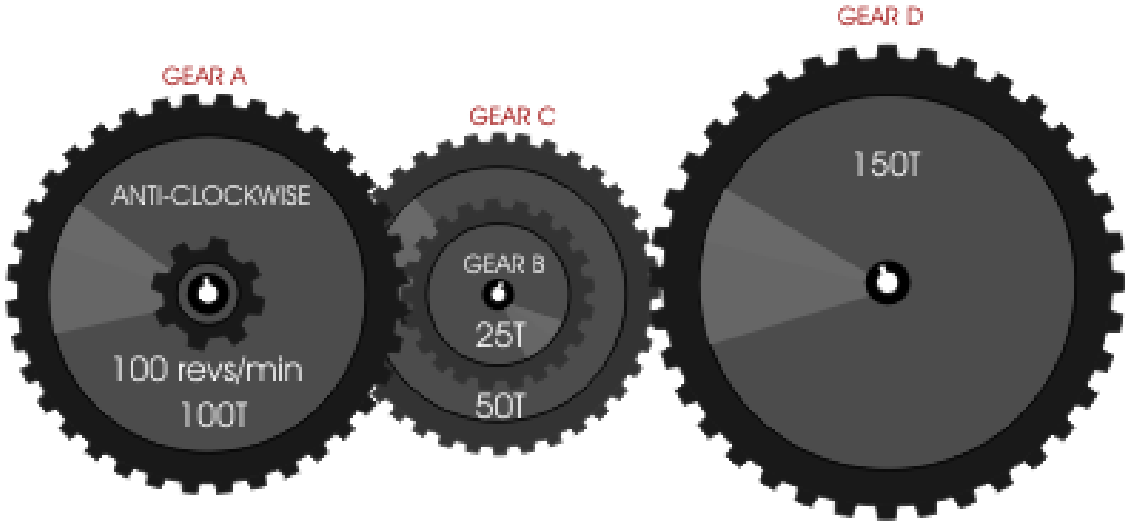


The gear ratio depends only on the number of teeth in the driver (input) and follower (output) gears.



Compound Gears





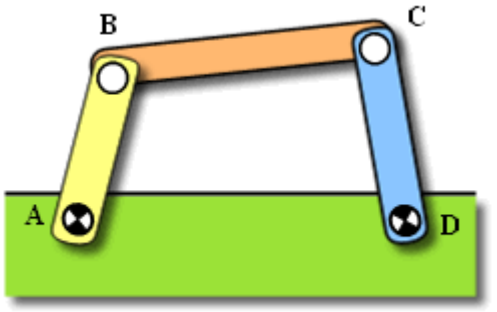
Gear ratios multiply:

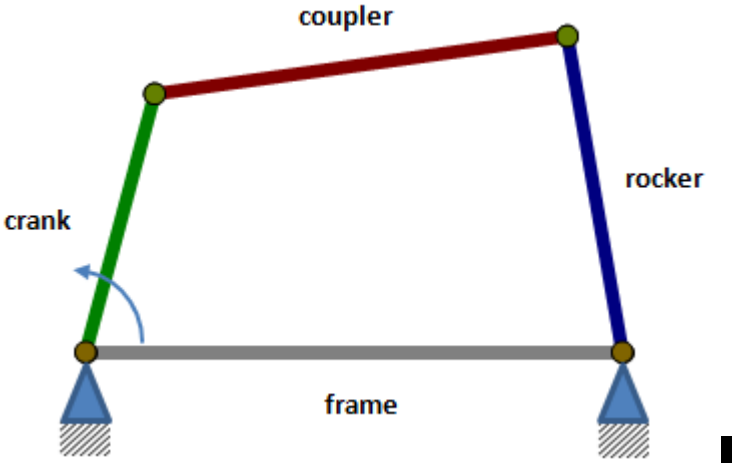
$(100:25) \times (50:150) =$

$4 \times (1/3) =$

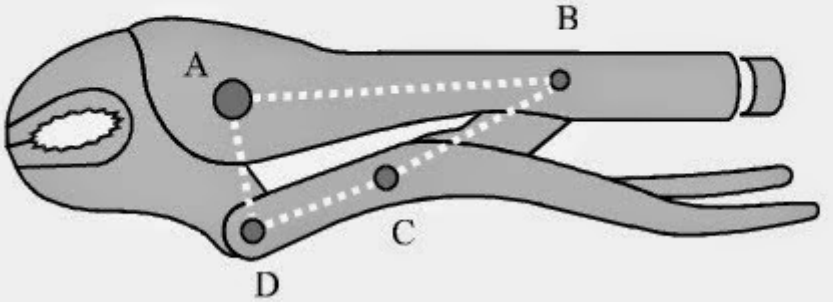
$4/3$

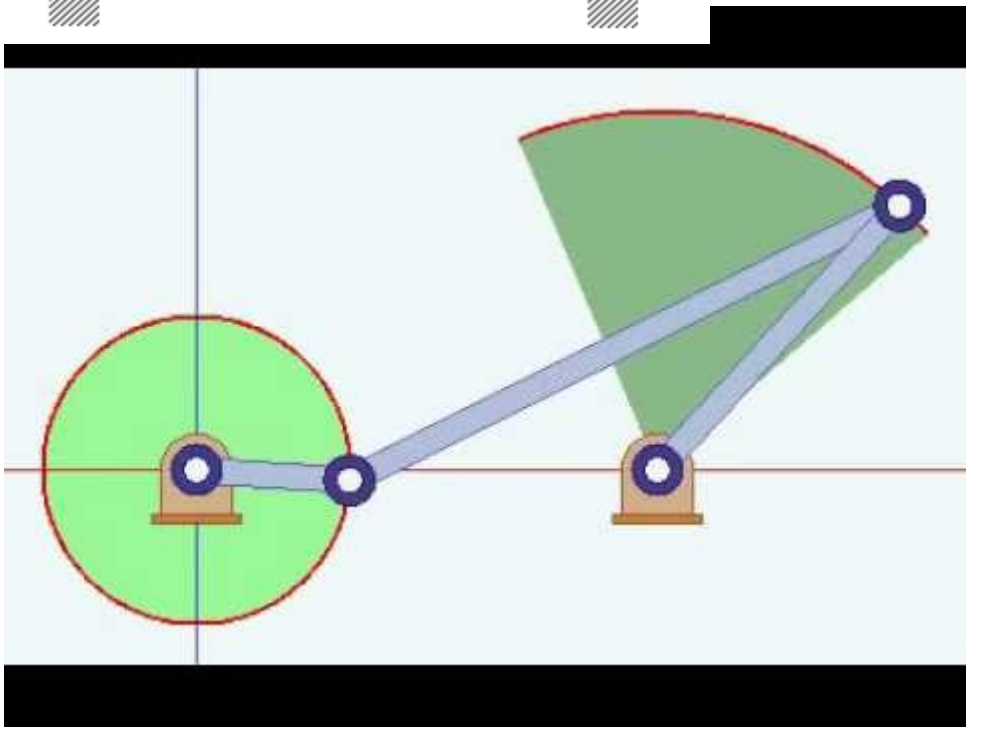
Four-Bar Linkage



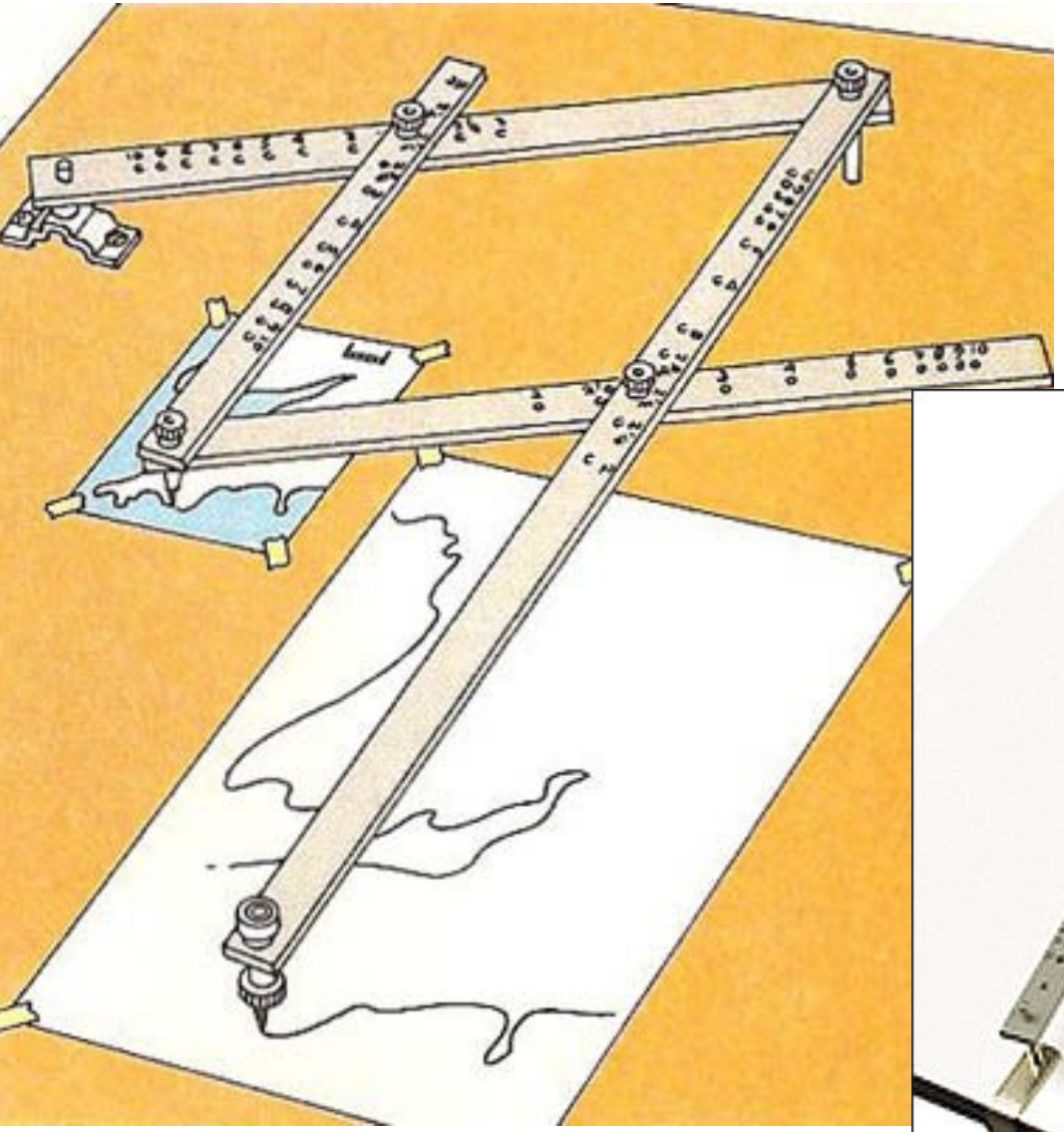


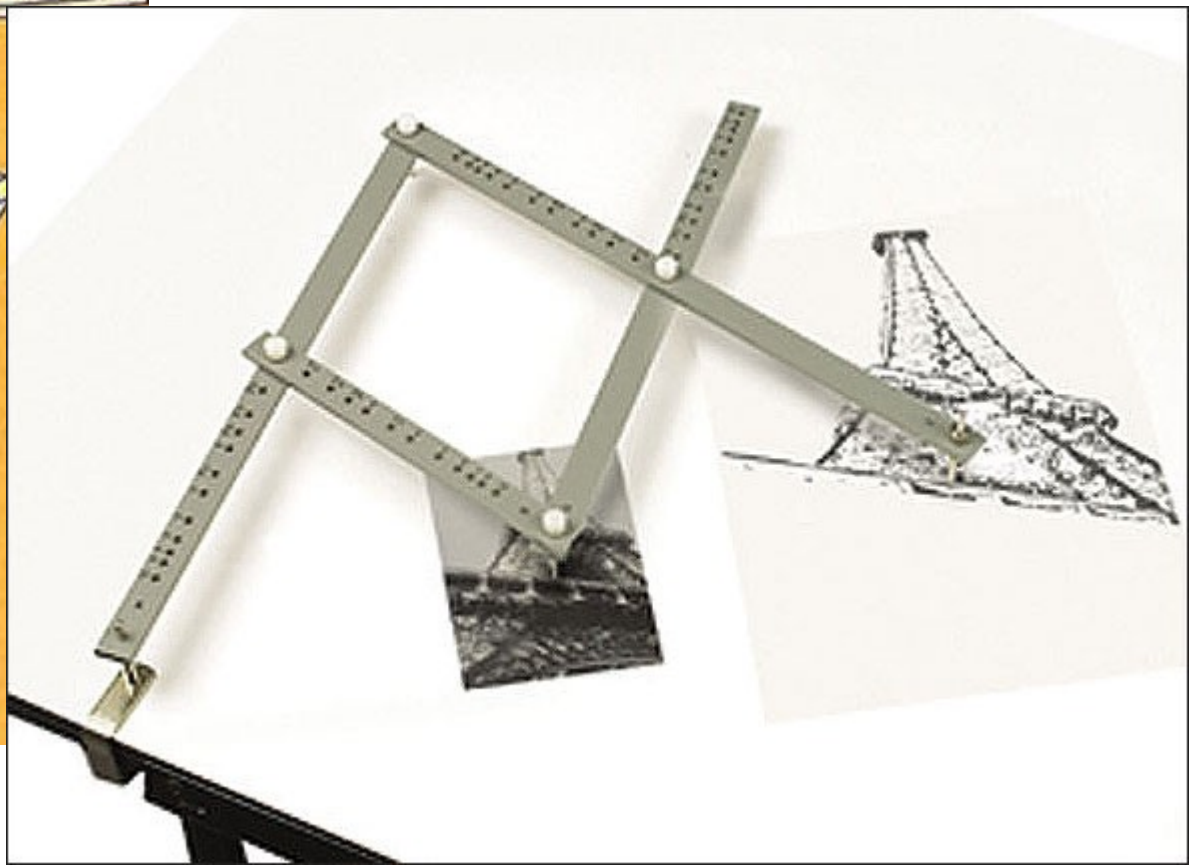
This pair of locking pliers employs a four bar mechanism. The white dashed line connecting pins A, B, C and D traces the four links in the mechanism.





Pantograph





Backhoe

Four Bar Prosthetic Knee Joint