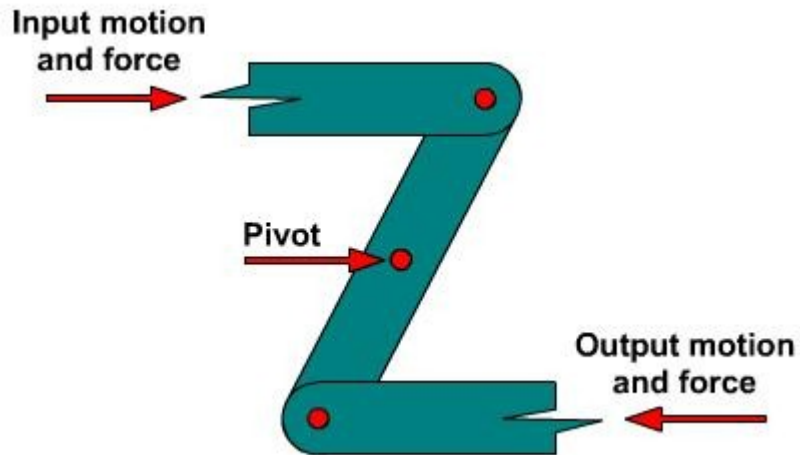


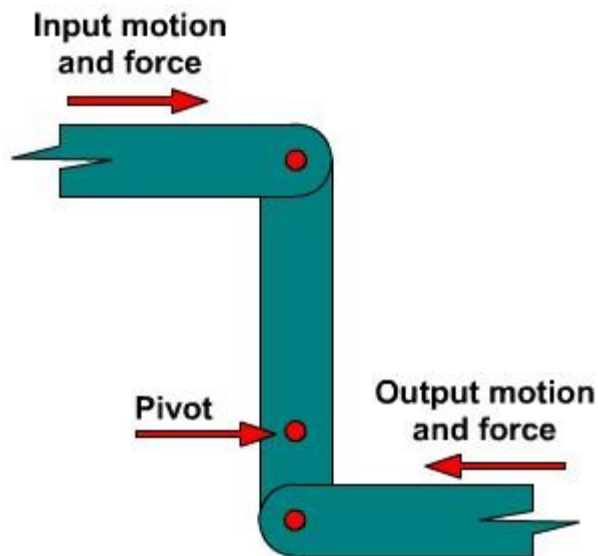
Linkages

A linkage is a system of connected rods and levers that are used to transmit motion and force. Linkages may be used to:

- change the direction of motion and force
- change the size of the output motion compared to the size of the input motion
- create parallel motion
- change one type of motion into another type of motion.



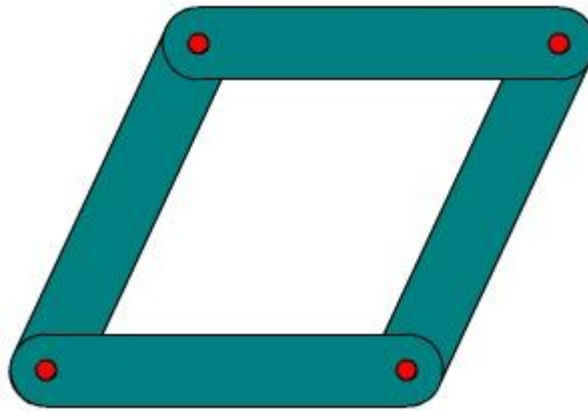
The linkage above illustrates how the direction of motion and force may be changed.



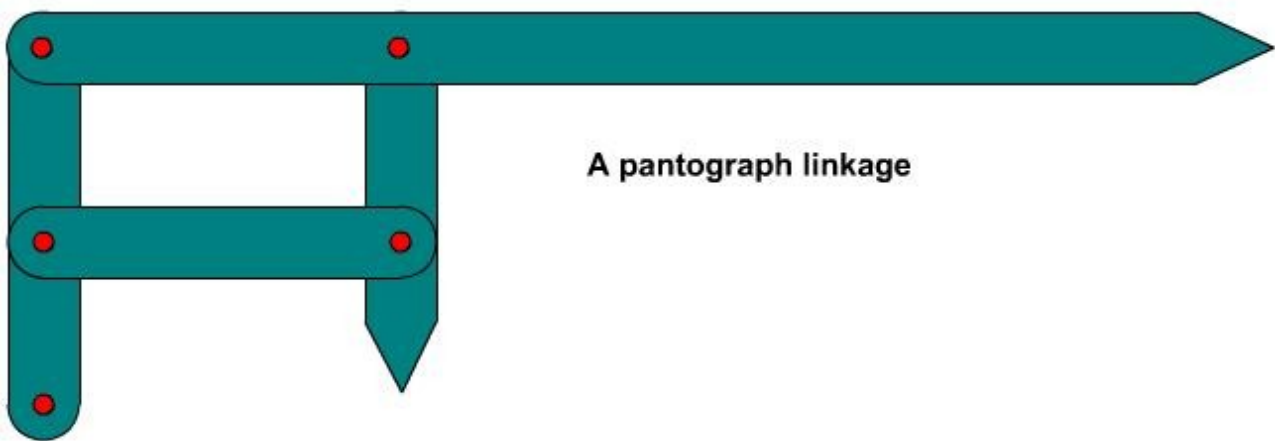
The diagram above illustrates how a linkage may be used to:

- change the direction of motion and force
- change the size of the output motion compared to the size of the input motion
- change the size of the output force compared to the size of the input force

A parallel linkage



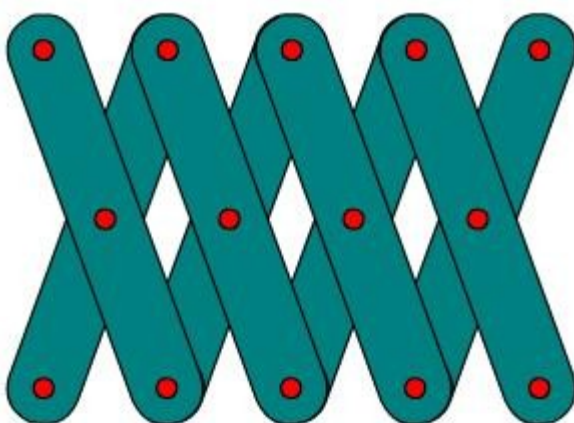
The diagram above illustrates how a linkage may be used to create a parallel motion.



A pantograph linkage

The diagram above illustrates a pantograph linkage. A pantograph is used to copy and rescale shapes and drawings.

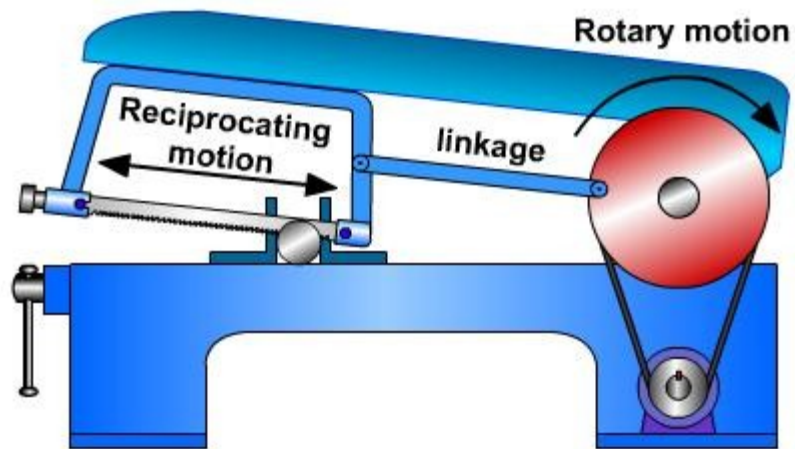
Lazy-tong linkage



The lazy tong linkage is used for lifting and reaching. It is the basic mechanism for car scissor jacks.

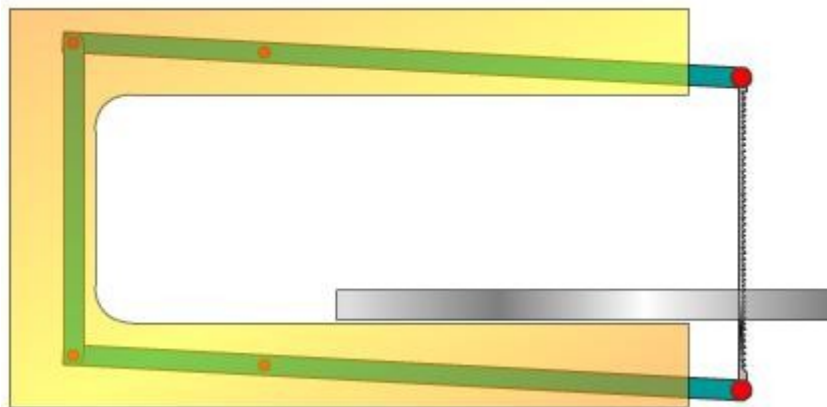


Power hacksaw



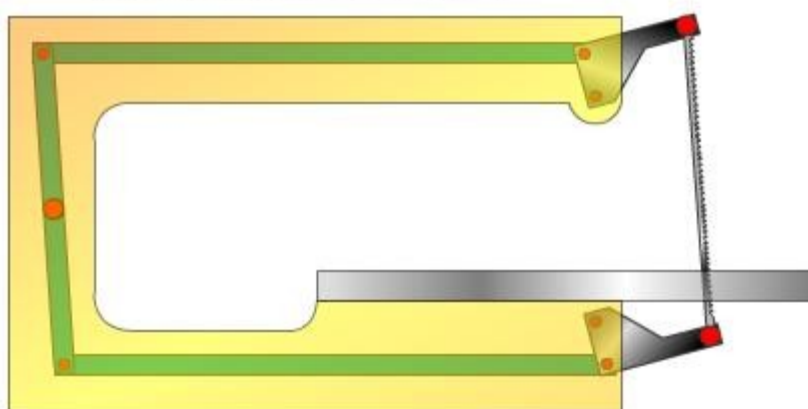
The diagram above illustrates how a linkage is used in the crank and slider mechanism of a power hacksaw and how rotary motion is converted into reciprocating motion.

Fret Saw: Parallel Arm



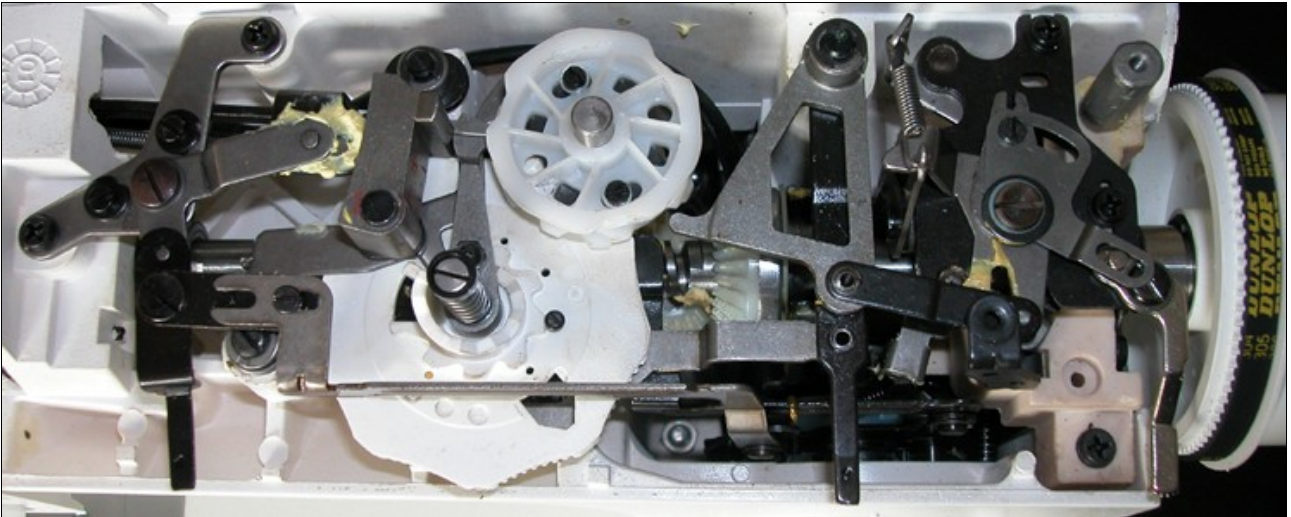
Parallel motion linkage used in a parallel arm fret saw.

Fret Saw: Parallel Link Arm



Linkages connected to two **bell crank levers** create a near vertical reciprocating sawing action.

Linkages found in a sewing machine



The photograph above shows various linkages and levers in a typical sewing machine. Also visible in the photograph is a belt and pulley drive, nylon bevel gears, retaining springs and lubricating grease.