



<http://www.scaryguys.com/mech.htm>

Basic Animation Mechanisms

Here's an overview of several different types of animation mechanisms that are useful for haunted prop use. This is not all the possible mechanisms, not by a long shot - but its a start!

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REMEMBER ALWAYS BE SAFE DESIGNING, BUILDING, AND USING ANIMATED PROPS They have the potential to cause harm to yourself, family, pets, and anyone nearby. Seriously, be very, very careful when building any animated prop! NEVER place a prop where it could touch anyone when its moving. Its just not worth it.

-- **DISCLAIMER** --

Basic Piston

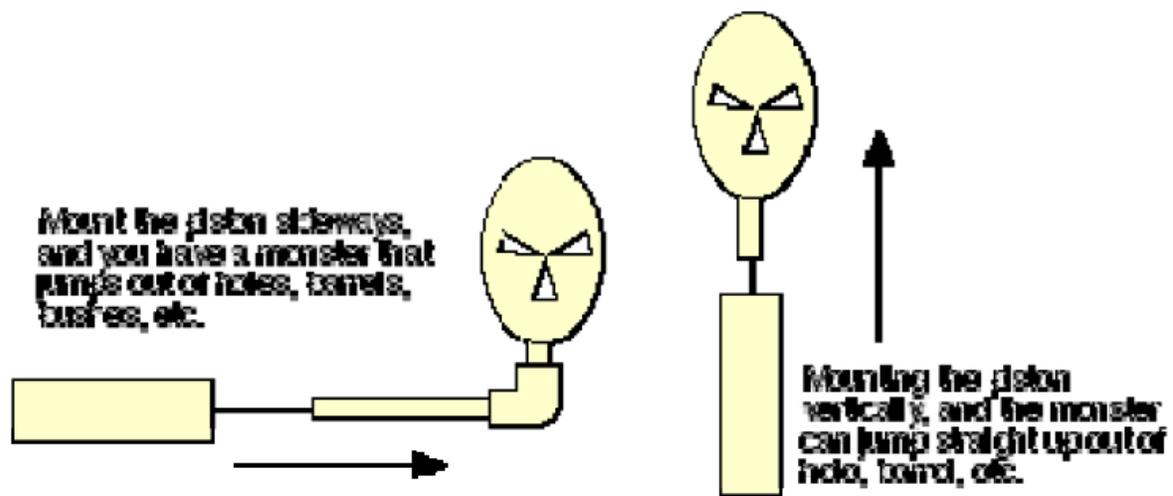
Often called the 'monster on a stick', this is the simplest application of pneumatics, and is effective for both distractions and scares.

Advantage: Simple to build and maintain Sturdy, reliable operation Straight up/down, or in/out motion

Disadvantage: Limited range of motion

Limits: Set by length of piston movement

Considerations: Careful construction with reliability in mind is recommended



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Simple Lever

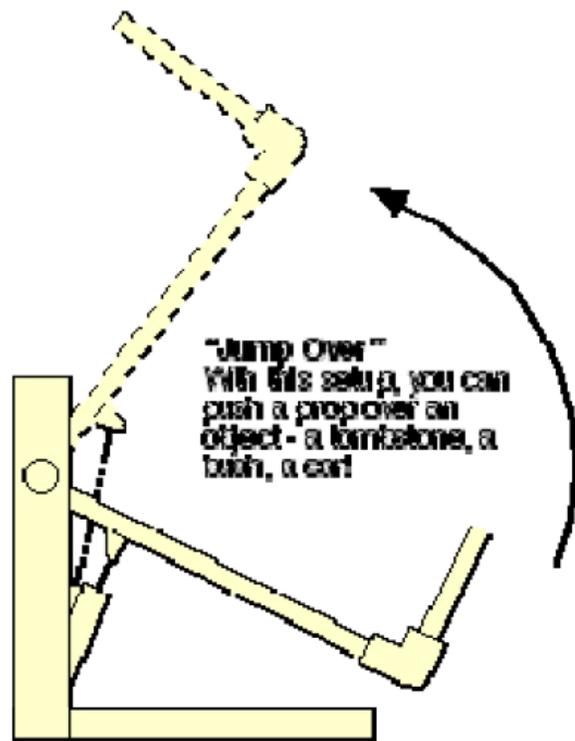
The easiest lever mechanism to build, the simple lever design gives fast, reliable movement around a single pivot point.

Advantage: The end arm moves towards the 'victim' Fast motion, low air pressure Simple construction

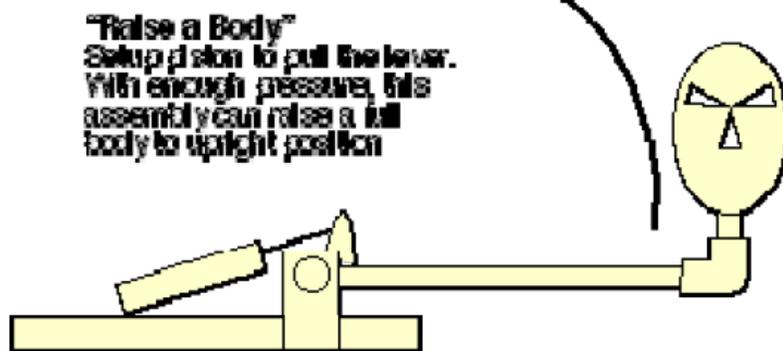
Disadvantage: Moves around a pivot, not straight up and down

Limits: Set by the placement of the pivot, the piston attachment point, the length of the arm, and the length of piston movement

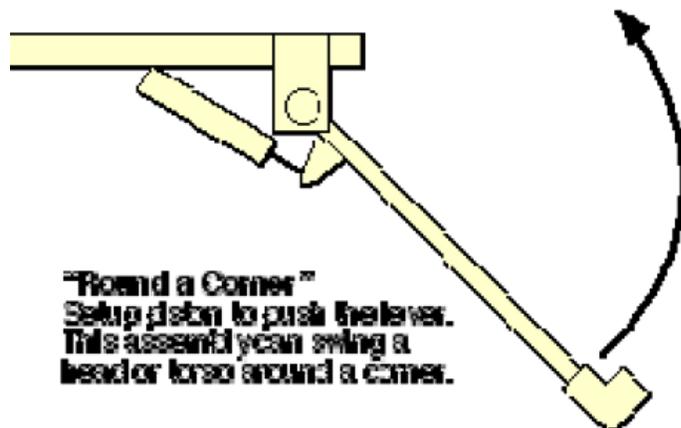
Considerations: Careful construction with reliability in mind is recommended



"Jump Over"
With this setup, you can push a prop over an object - a tombstone, a bush, a car!



"Raise a Body"
Setup piston to pull the lever. With enough pressure, this assembly can raise a full body to upright position.



"Round a Corner"
Setup piston to push the lever. This assembly can swing a head or torso around a corner.

Basic Parallelogram, or "Four Bar" Mechanism

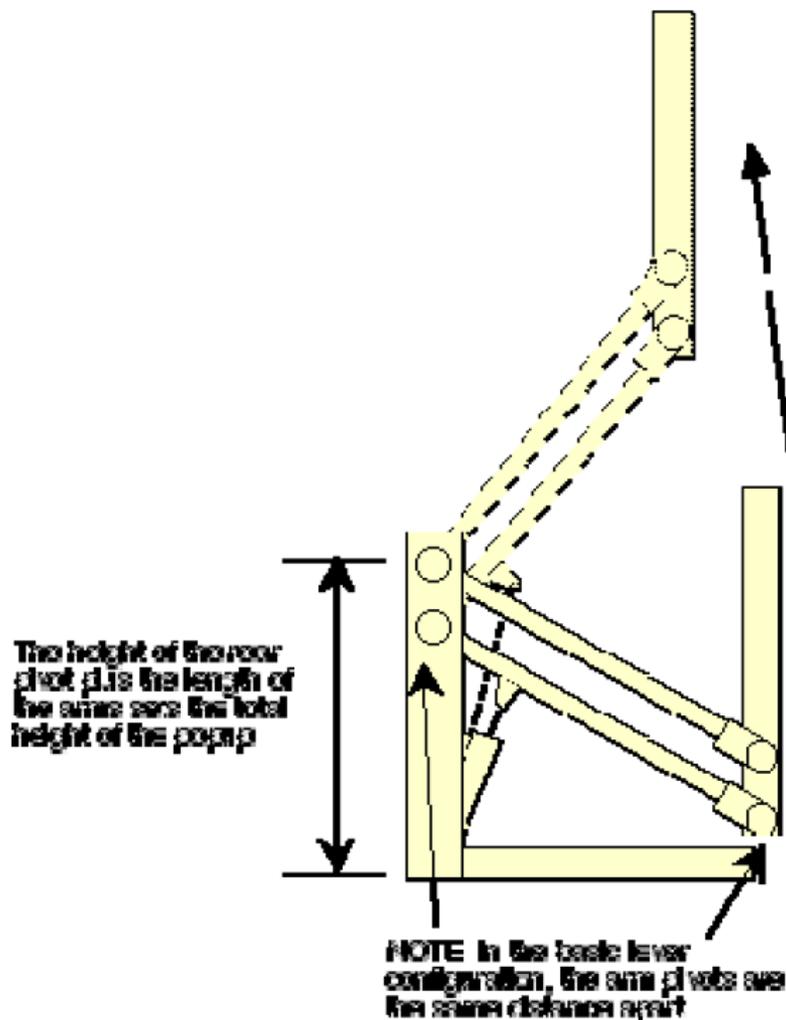
This is probably the most popular popup mechanism. Its very flexible, and offers a great range of motion. Even though its based on the geometric parallelogram, most folks call it a 'four bar' mechanism.

Advantage: Moves the prop almost straight up and down, so with long enough arms, a complete body can be popped.

Disadvantage: More complex than simple lever designs. Requires more air pressure to activate.

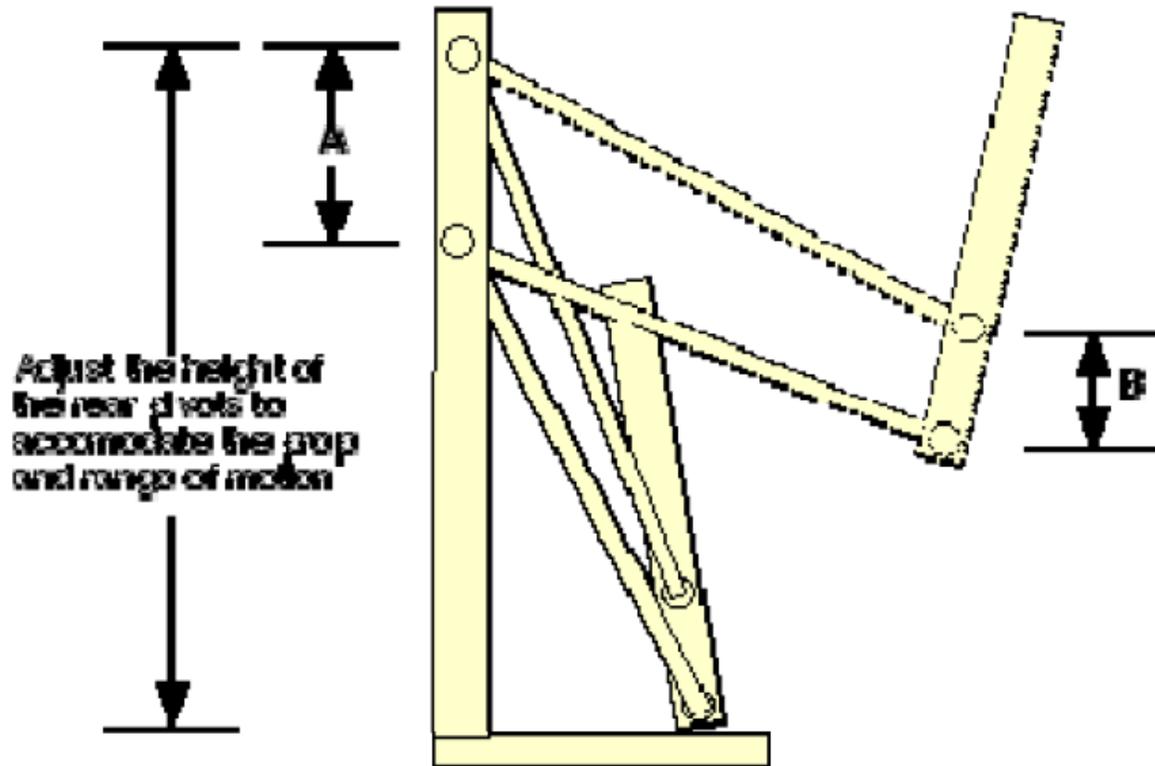
Limits: Set by the placement of the pivot, the piston attachment point, the length of the arm, the length of piston movement, and the mechanical limits of the arm connections

Considerations: Careful attention to pivot points is a must. Watch prop action at ends of motion. May need to make changes in arm lengths to accomdate prop.

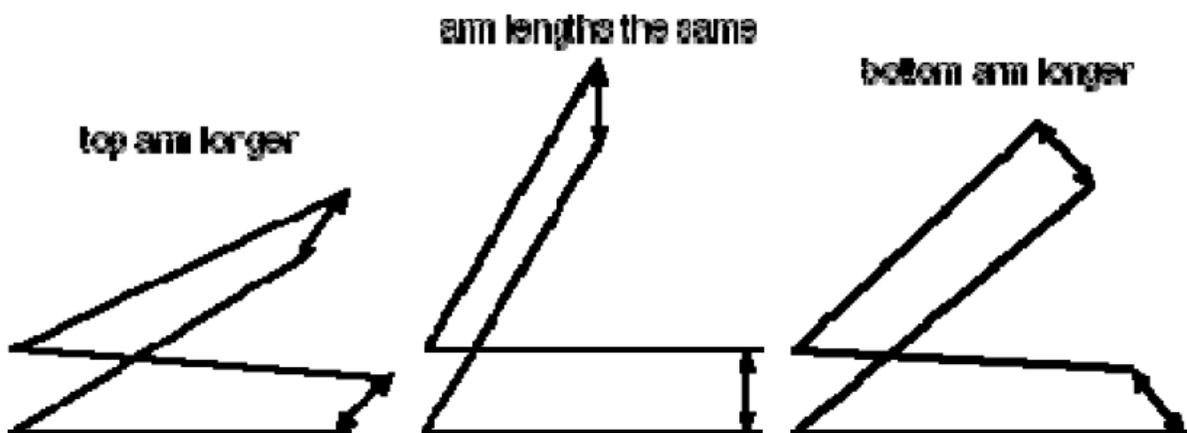


Adapting the Four Bar Mechanism

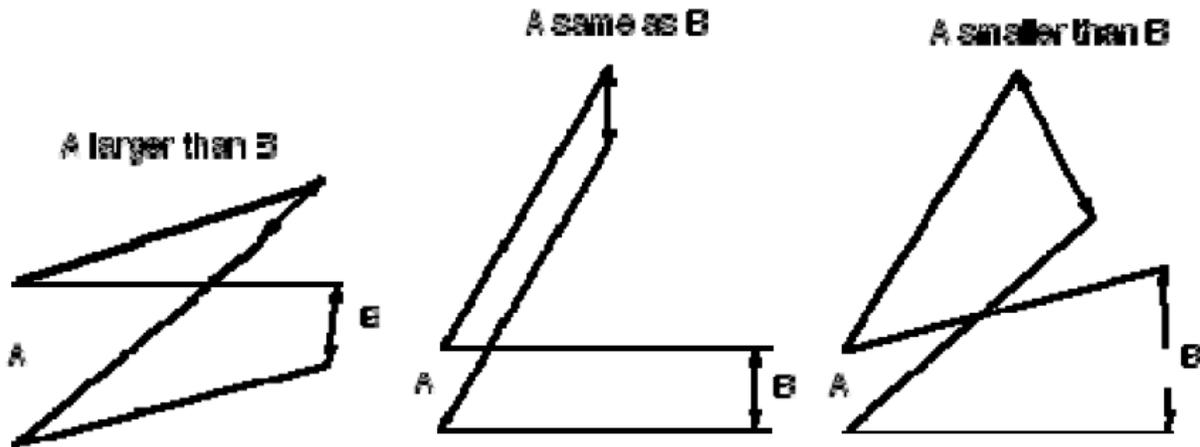
Making changes to the arm lengths and the pivot positions cause some interesting changes in the dynamics of the prop movement.



Changing the arm length tilts the prop without changing the pivot distances (A and B). The tilt remains (more or less) constant throughout the movement.



Keeping the arm lengths the same and varying the lengths of the front (A) and rear (B) pivots affects the angle and movement of the prop. Making A larger than B makes the prop lean forward as moves. Making A smaller than B makes the prop lean back as it moves.



The Scissors Lever

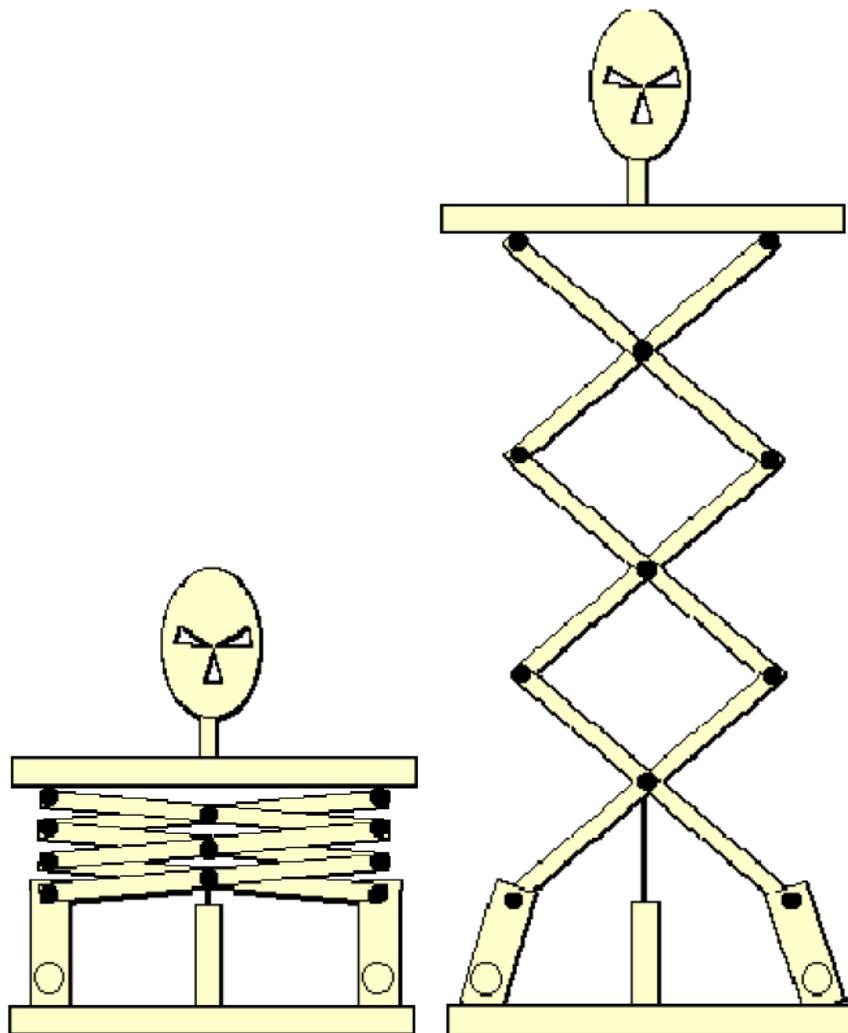
The scissors lever gives the greatest range of motion of any of the lever arrangements, and is the most complex to build.

Advantage: Moves the prop straight up and down. Very large range of motion.

Disadvantage: Far more complex than simple lever designs. Requires more air pressure to activate than simpler mechanisms. Difficult to design for reliability.

Limits: Arm lengths and piston arm set the maximum extension.

Considerations: Careful attention to pivot points is a must. High strength bearings recommended.



Sources

Terror By Design Timers, triggers, servo controllers, haunted house supplies, and good, honest advice www.terrorbydesign.com

Scare Factory Unique pneumatic props - very professionally constructed, possibly the best price/performance out there! www.scarefactory.com

Distortions Maker of some of the largest and effective animated props. Good stuff!
www.distortionsonline.com

Little Spider Productions Effective, simple popups that will work anywhere
www.littlespider.net