HalloweenAddiction.com How-to

# Leaping Witch

Event:

A witch sits still in front of a fire, and when a guest nears, she leaps forward and upward, and her head extends above the approaching guest.

Note:

Instructions in the website flash animation are incorrect, and need updating… I will endeavor to update the online instructions to match those documented here.

Materials:

- PVC Fittings (Schedule 40)
  - ☐ 2 – 1" Tee w/ ½" threaded center leg (air inlet)
    - ☐ Options to use threaded adapters here if needed
    - ☐ 2 – ½" thread to barb (brass/plastic connect to air)
  - ☐ 2 – 1" Cap (standard slip) (cylinders)
  - ☐ 2 – ½" Cap (standard slip) (pistons)
  - ☐ 1 – ¾" Cross (standard slip) (cylinders)
  - ☐ 1 – ¾" to ½" Reducer (standard slip)
  - ☐ 2 – ¾" Plug (standard slip) (cylinders)
  - ☐ 5 – ¾" Tee (standard slip on all sides)
  - ☐ 8 – ½" Tee (standard slip on all sides)
  - ☐ 8 – ½" 90 degree Elbow (standard slip)
  - ☐ 2 – ½" 45 degree Elbow (standard slip)
- ~3' of 1" Schedule 40 PVC Pipe (Gray Electric), cut into:
  - ☐ 15" piece (lower Cylinder)
  - ☐ 19 ¼" piece (upper Cylinder)
- ~3' of ¾" Schedule 40 PVC Pipe, cut into:
  - ☐ 2 – 16" pieces (thigh bones)
- ~24' of ½" Schedule 40 PVC Pipe, cut into:
  - ☐ 1 – 16" piece (lower Piston)
  - ☐ 1 – 24 ½" piece (upper Piston)
  - ☐ 2 – 17" pieces (base - calf bones)
  - ☐ 2 – 8" pieces (base)
  - ☐ 2 – 12 ½" pieces (base)
  - ☐ 1 – 22 ¼" piece (base angle brace)
  - ☐ 4 – 5" pieces (base)
  - ☐ 1 – 11" piece (base back)
  - ☐ 2 – 19" pieces (upper body)
  - ☐ 2 – 11" pieces (upper body)
  - ☐ 2 – 1 ½" pieces (shoulders)
  - ☐ 2 – 13" pieces (upper arms)
  - ☐ 2 – 9" pieces (lower arms)
- PVC Primer & Cement
- Hoses for air, air compressor, pressure regulator

PVC Pipes - Schedule 40

| Nominal Pipe Size *(inches)* | Outside Diameter *(inches)* | Minimum Wall Thickness *(inches)* | Nominal Inside Diameter *(inches)* |
|---|---|---|---|
| 1/2 | 0.840 | 0.109 | 0.622 |
| 3/4 | 1.050 | 0.113 | 0.824 |
| 1 | 1.315 | 0.133 | 1.049 |
| 1 1/4 | 1.660 | 0.140 | 1.380 |
| 1 1/2 | 1.900 | 0.145 | 1.610 |

Directions:

1) Please review the PDF Download on making PVC Cylinders at www.HalloweenAddiction.com to familiarize yourself with more detailed steps than noted below. Where instructed to "Cement", please use PVC Primer & Cement.

2) Create the "Lower" Cylinder (which makes the witch stand up)

   Make the Cylinder

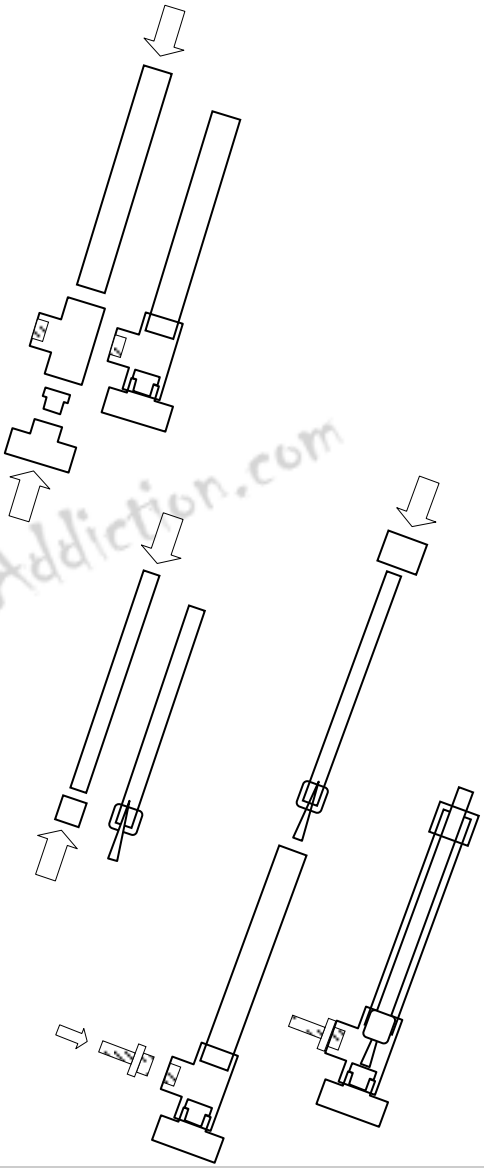
   - Cement a ¾" Plug into to center of a ¾" Tee (makes the base of the cylinder air tight)
   - Cement the 1" Tee over the center of the ¾" Tee as shown. (This may be a loose fit, use extra cement)
   - Sand the inside of the 1" PVC (bottom) so it is rounded, and the piston (cap) won't catch on it when activating, then Cement the rounded edge of the 15" piece of 1" PVC into the Tee.

   Make the Piston and Install it

   - Cement a ½" Cap onto the end of a 16" long ½" PVC
   - Sand the ½"Cap on belt sander, turning constantly to avoid flat spots until it slides smoothly in and out of the 1" PVC Cylinder…
   - Drill a pilot hole, and place a screw into the center of the ½" Cap, so the Piston doesn't get caught inside the piston when activating (should extend out ~1")
   - Drill a 7/8" Hole into the center of a 1" Cap, for the Piston to extend through, sand the hole smooth, and dry fit it into place with Piston installed… make sure the Piston moves smoothly. When satisfied, cement the 1" Cap in place with Piston installed.

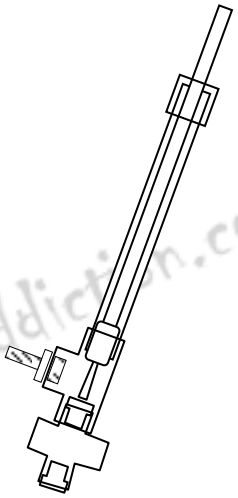
   Connect it to Air

   - Install the thread to barb fitting for the air hose, connect an air source (with valve) and test out the cylinder.

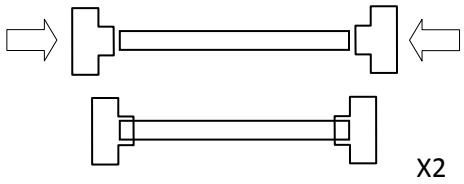


3) Create the "Upper" Cylinder (which serves as the backbone and lifts the head)

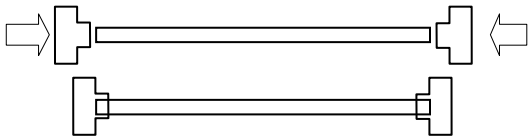
   - Follow the steps for the "Lower" Cylinder in #2 above.
   - Differences:
     i. Use the ¾" Cross instead of a ¾" Tee for the bottom of the Cylinder
     ii. The 1" PVC Cylinder should be 19 ¼" long
     iii. The ½" PVC Piston should be 24 ½" long (or longer… the Styrofoam ball / head mounts to this)
     iv. The ¾" to ½" Reducer should be cemented into the bottom of the ¾" Cross. This allows you to insert the Lower Cylinder's ½" Piston into it snugly.



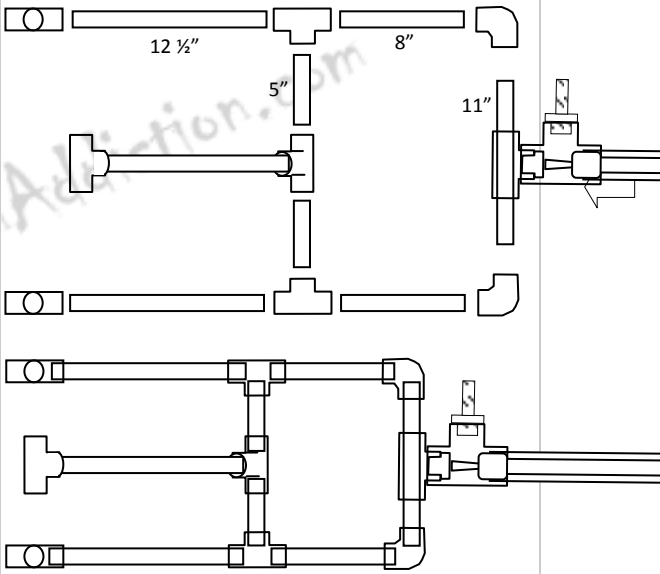
4) Make the "Thigh" bones out of ¾" materials… this is what allows the witch to stand… as the joints at the "knee" and "hip" are loose and can pivot.
   - Cut 2 pieces of ¾" PVC to a length of 16"
   - Cement a ¾" Tee onto both ends of each piece, as shown.



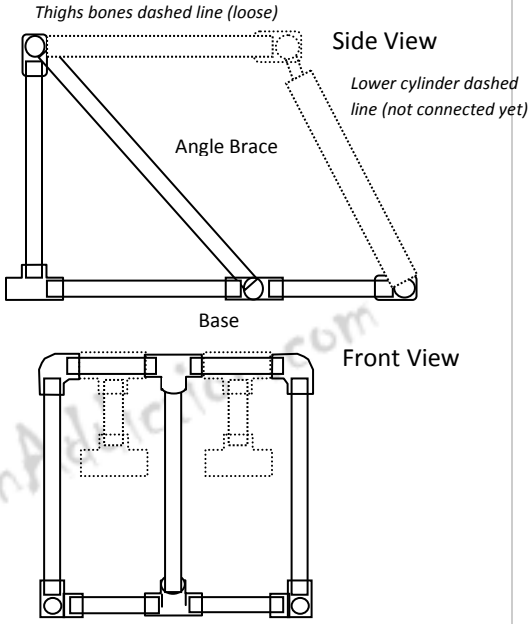

5) Build the Base Angle Brace in a manner similar to the "Thigh" bones
   - Cut a ½" PVC piece to 22 ¼" in length
   - Cement a ½" Tee onto both ends of this PVC pipe.



6) Make the Base (This sits directly on the floor), attaching the Lower Cylinder onto the back (loosely). Dry fit assembly before cementing. (You may want to leave some joints non-cemented so it can be taken apart for storage.)
   - Layout the base using 2 - ½" Tees, 1 - ½" 90 degree Elbow, and ½"PVC pipe (12 ½" and 8") on each side.
   - Connect these in the center with 2 – 5" pieces of ½" PVC connected into the angle brace you just made. (The angle brace will angle upwards off the floor to connect at the knees… see next step)
   - Connect the back of the base with a 11" piece of ½" PVC pipe, which has been slid through the ¾" Tee at the bottom of the "Lower" Cylinder (should be loose).

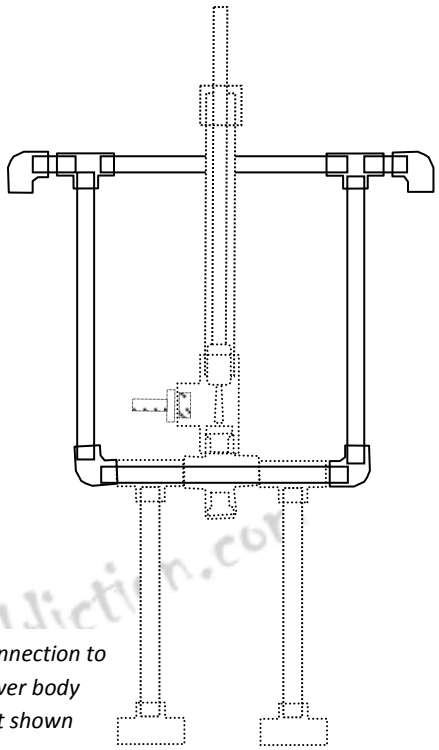



7) Add the Lower legs and "Thigh" bones
   - Place a 17" piece of ½" PVC (Calf bones) upright into each of the front ½" Tees on the base.
   - Connect a ½" 90 degree Elbow onto the top of each of these, so they face each other.
   - Connect a 5" piece of ½" PVC pipe between the Elbow and then slide one end of the "Thigh" bone onto it (which is loose, this is the knee hinge)… the other end of the 5" pipe will insert into the upper 1/2" Tee on the Base Angle Brace



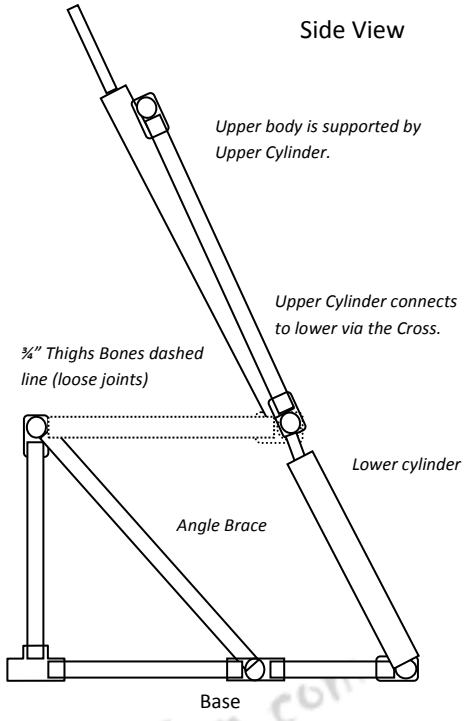
8) Make the body, attach the “Thigh” bones and the “Upper” Cylinder to it.

- The body is a simple rectangle, created with ½” PVC pipe
- Cut 2 pieces each at 19 ½”, 11” and 1 ½” in length.
- Assemble the pieces as shown using ½” Tees and 90 degree Elbows, the small 1 ½” pieces of PVC allow the “Shoulders” (90 degree Elbows) to be attached. These should not be cemented, as you may wish to position them differently depending on your haunt.
- The lower connecting piece will have the ¾” “Thigh” bones and the ¾” Cross (Upper Cylinder) slid loosely onto it.
- The Upper Cylinder does not attach to the neck/shoulder area… you may want to zip tie or tape this section at a later point.



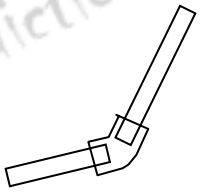

9) Attach the “Lower” Cylinder to the “Upper” Cylinder

- The Upper Cylinder has a ¾” to ½” PVC reducer in the bottom of the ¾” Cross. Simply insert the ½” Piston from the Lower Cylinder into this, and the backbone will be rigid at an upward angle (this is the way the witch is going to leap).
- The Upper Body can simply rest on the Upper Cylinder, but you should likely tape or zip tie it.



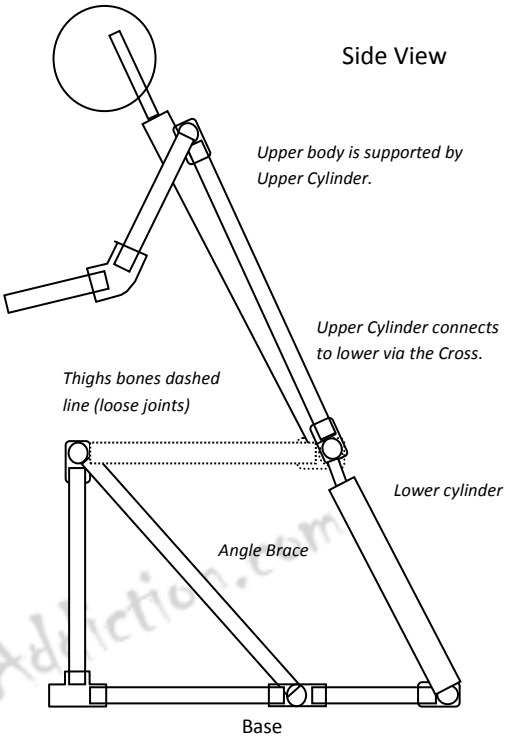

10) Assemble the Arms

- Cut 2 pieces of ½” PVC to a length of 13", and 2 more to a length of 9”.
- Connect a 13” and 9” piece together with a 45 degree ½” PVC Elbow… don’t cement, as this will allow you to position the arms. Repeat for second arm.



11) Connect Arms and Head to the Body

- Fit each of the arms into the shoulders by inserting into the ½" PVC 45 degree Elbow. (I insert the longer part of the arm, so that when I dress the PVC up, the PVC does not show out of the sleeves.)
- Adjust the arms into a position that's acceptable for the haunt's need by adjusting the pipes and the related elbows.
- Place the Styrofoam ball or head onto the extended Upper Piston by pressing down, the PVC pipe should easily penetrate the styrofoam. You may want to keep it off center, so the face naturally pulls forward (lowest point). I've attached Halloween masks with roofing nails through the back of the latex mask into the Styrofoam.
- Optional: Pad out the figure, loop a bit of ½ foam or other material to give the creation some depth.
- Dress the character up. I sewed a cloak to cover the witch, including a hood and very narrow sleeve to cover the PVC piston neck as the head lifts off the shoulders.




12) Connect compressed air, and test the system

- You will need to connect an air hose to each of the pistons. As the lower piston is lifting more weight, it may require additional pressure to lift, while the upper piston is only lifting a Styrofoam head. If you use the same source for these, you may need to install a pressure regulator between them, allowing higher pressure to go the Lower Cylinder, and lower pressure to drive the Upper Cylinder.