ALLEN'S HALLOWEEN PAGE

http://softlyspokenmagicspells.com/halloween/dcs.html

Dangling Crank Spider

A colorful spider with a three-foot leg span hangs from the ceiling of my porch about 6 feet high. The legs move in a rhythmic wave pattern. It's lit so the legs cast long, creepy, moving shadows down the front of my house.

Here's a 150k MPEG showing how the spider's legs move and how it looked Halloween night. Set your player to loop.
And here's a 439k MPEG of a DCS built by Derek Wang using this web page. Nice work, Derek!
And here're a few photos and a video of a DCS made of bones by PerfessorEvil. Creeeeepy. He used significantly different construction.

My DCS is a puppet moved by a rotating crank. It's based on the popular Flying Crank Ghost (FCG) designed by Doug Ferguson.

I made the body out of wood and papier-mâché (newspaper shredded in a blender with a little Elmer's white glue added). The thorax is just a piece of wood with a little papier-mâché on the top and bottom to round it out. The abdomen is a shell made by applying papier-mâché to a balloon. I taped the balloon up a bit to elongate it. I Epoxied the abdomen to the thorax after it had dried completely.

The legs are made of segments of wooden dowel with their ends ground at angles and Epoxied together. I had to scrape away the burnt wood caused by the grinding in order to get the Epoxy to stick.

I found that the easiest way to do this was to drill shallow holes. I used Fun Tack (a non-staining putty intended to stick things to walls) to hold the legs in position on a table as the Epoxy hardened.

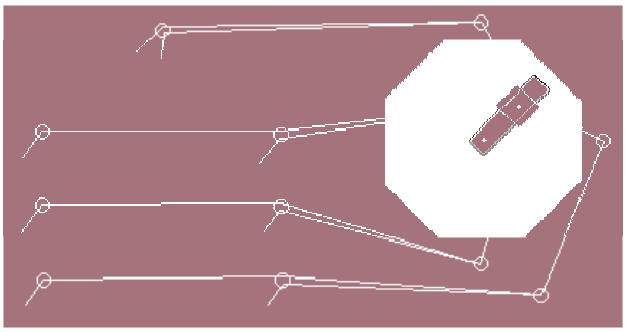
The legs are attached to the thorax with short pieces of rope epoxied into holes. The rope acts like a hinge. I left enough space between the legs and thorax for the legs to move, about a quarter of an inch.

The spider is painted with brush and spray paint to match this picture of a Saint Andrew's Cross spider I found on the Web. (Heh, no pun intended.)

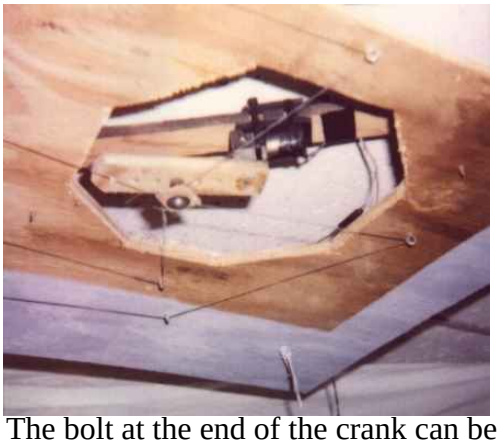
The spider hangs from a piece of plywood which is painted light gray to match the porch ceiling. The plywood hangs on four screw hooks in the wooden ceiling. Twenty pound test monofilament fishing lines run from the front and back of the abdomen to the plywood and hold the body of the spider at a fixed position. They're tied to screws in the back of the abdomen and in the wooden thorax.

Fishing lines run from the high point of each leg up to eye bolts in the plywood directly above, then the lines turn to the side and run parallel to the surface of the plywood. The legs are divided into four left/right pairs. Each pair of lines is routed around to one of four points around the crank arm, and then tied to the slip-ring on the end of the crank.

The lines for the front legs run up to just one eye bolt. This draws the front legs together and forward.



Stringing the lines is a bit tricky. I removed the slip ring and bolt from the crank arm and positioned it in the middle of the hole in the large piece of plywood. Then I strung the lines so the legs were all at the same height. This height would be the middle position in their range of movement.
All the lines are spray-painted flat black so they don't reflect light.
It's very important to grease the fishing lines. Without grease, the motor can't start without assistance and the movement is very jerky. I used white lithium grease available in toothpaste-sized tubes at hardware stores.

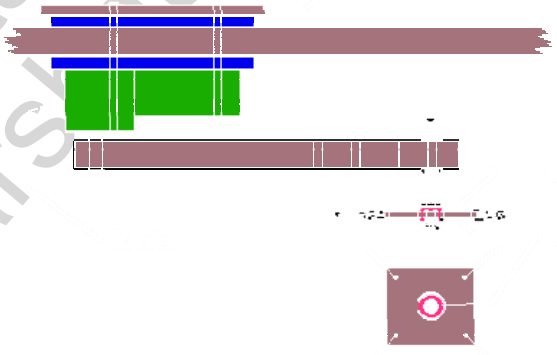


The motor's mounting beam is made of plywood, and is screwed to the large piece of plywood on plywood legs to hold it up so the crank is at the same level as the large piece of plywood.

The crank arm is a piece of plywood. The crank is Epoxied directly to the motor shaft. I cut several shallow grooves into the shaft at various angles with a hacksaw to give the Epoxy something to grab on to.

The bolt at the end of the crank can be placed into any of several holes to adjust how much the legs move. The slip ring at the bottom of the bolt is made of 1/8 inch plywood, but metal would probably have been better. It can turn freely on the bolt. The piece of PVC tubing at the bottom of the bolt allows the lowest nut to be tightened down without stopping the slip ring from turning.

Stiff foam rubber pads isolate the motor to reduce noise. They are stiff like the cushioning in a shoe rather than a furniture cushion. The motor and wooden top plate are clamped against pads with zip ties.



The motor, zip ties, and top plate touch only the pads. Without the pads, the motor's vibration is transferred to the wooden mounting beam which makes a lot more noise. I had to cut grooves for the zip ties in the mounting beam, but that's just because I made it too wide.

On Halloween night, the motor noise from the DCS was no louder than the fan inside the ultrasonic humidifier nearby.

In operation, a cardboard cover conceals the crank. I removed it for the pictures.
The only parts I had to buy were the eye bolts and some of the dowels for the legs. Everything else I had laying around. The motor was salvaged from a broken dollar bill changer liberated from a dumpster.

If the motor runs at a speed too close to the swinging resonance of the spider, it will start swinging, and the swinging will build up to an unacceptable level. I could prevent the swinging by running the static support lines at angles, but I wanted to be able to adjust the angle of the spider by tilting the plywood platform. I ended up hanging the front of the platform about three inches lower so the spider's body could be more easily seen. The resonance of the spider will depend on the length of the lines and the weight of the spider, so I can't tell you exactly what speed motor to use.

The best bet is to get a 12 volt DC motor which runs at the fastest speed you think you might want the spider to go, and power it with a switchable power supply which can do 3, 4.5, 6, 7.5, 9, and 12 volts. You can also wire up an ordinary $5 rotary light dimmer (the kind designed to be installed in place of a light switch) into an extension cord, and plug a 12v supply into it. The dimmer will allow the voltage to be adjusted. These "dimmer cords" are also very useful for lights.

My motor runs at 45.9 RPM with the power supply I'm using. I had to slow it down to 26.3 RPM with an adjustable power resistor to reduce the swinging. I could use a lower voltage power supply, but I don't have any other use for this one because it's a weird voltage. Power resistors are less expensive than power supplies, and efficiency isn't an issue.