One-Finger Eye Movement and Blinker Control

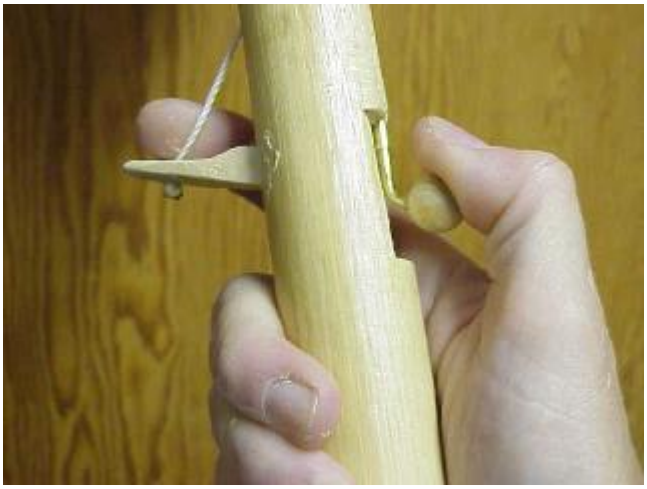
Professional figures often have blinkers, and they typically have a common control characteristic: They use independent levers to control the mouth movement, eye movement, and blinkers. The control configurations on the headsticks are different from figure to figure, and they often present manipulation difficulties, particularly for very young and older ventriloquists. It's not easy to blink while the eyes look to the left or right, and it's not easy to move the eyes while the blinkers are part-way down. Sometimes it's impossible to do either.

My hobby is figure making, so I decided to invent a one-finger control mechanism to address these problems. This document describes the prototype I built from the design. The pictures are of a recently finished ventriloquist figure, the first to employ the one-finger control mechanism.

I don't know if another figure maker ever used this approach, so I can't claim to be the original inventor, but in case I am, I hereby place the mechanism's design into the public domain so anyone may use it.

Controls

The mechanism and its control are simple, as any good design should be. Following is a picture of the headstick showing a traditional mouth lever and the one-finger control.



In this configuration for a right-handed ventriloquist, the index finger operates the mouth lever and the thumb operates the one-finger eye/blinker control. The figure's face, which you cannot see, faces forward in the picture.

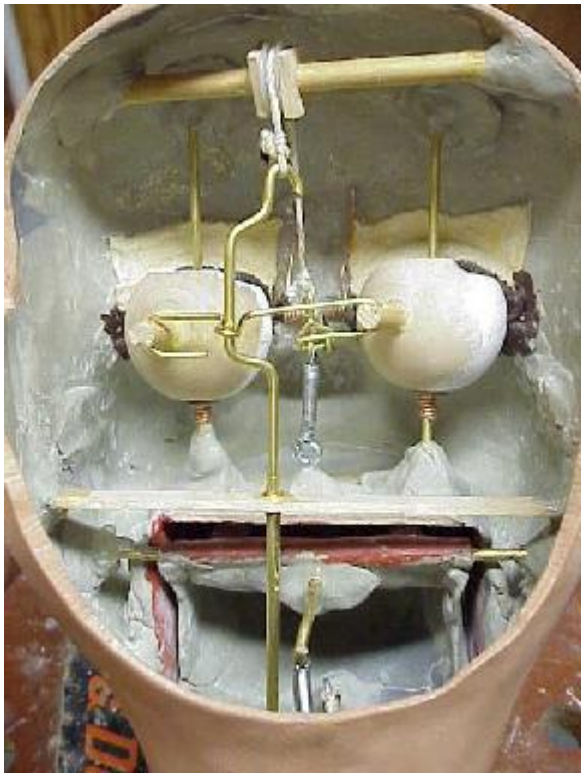
To move the eyes, the ventriloquist rotates the ball on the control from side to side, which is how eye movement controls work on many professional figures. In this particular design, rotating the ball to the left moves the eyes to the right and vice versa. Some figures work the other way.

To close the blinkers, the ventriloquist slides the lever downward with the thumb. The blinkers are kept normally open by a spring mechanism, so the ventriloquist releases downward pressure on the control to open the blinkers.

The one-finger (one-thumb, actually) control is smooth, quiet and intuitive to use.

Blinker Mechanism

The following picture shows the mechanism with the blinkers open and the eyes looking right. The brass control rod comes straight up from the headstick on the left side of the stick. The rod is housed in a brass sleeve for smooth operation. A wooden horizontal bar stabilizes the sleeve so it does not move around when the eyes move.



The blinkers are made of chamois cloth glued to independent brass wire frames. I used the techniques that I describe in the essay, Leather Blinkers (see tutorial on **Puppets and Props** website/How To/Figure Making). I tried building them as a single unit on a single frame, but the axes of rotation are different for the two eyes and the one frame failed to properly coordinate the blinker movements. This is because the face is not perfectly symmetrical. You can see in the pictures that the eyes are at slightly different heights.

The following picture shows the mechanism with the blinkers down and the eyes looking straight ahead.

The eyes are synchronized by a rod that runs from the rear dowels of each eyeball. A thin U-shaped protrusion to the rear permits the control rod to move the eyes. To reverse the direction of the control lever, you would make

this protrusion go toward the front and modify the control rod accordingly.

(I had not installed the self-centering mechanism when I took these pictures.)

The eye movement control rod is typical of modern eye movements except that it is extended and bent so the blinker string can be connected to a hook at the end of the rod. The bends in the control rod must be such that the hook rotates on the same axis as the control rod in the sleeve. The eye movement bent-out part must be long enough to move the eyes when the blinkers are up or down. It must be positioned correctly so there is enough rod below it to pull the blinkers all the way down and not too much above it so the blinkers fully retract.

Similarly, the headstick slot that houses the one-finger control rod's lever must be long enough to accommodate the full up and down travel of the blinker control.

The string runs up through a pulley and down to the levers that, when pulled up, blink the eyes. A spring runs down from these levers to open the eyes. The spring is attached at the bottom to the top of the roof of the mouth. A tiny brass coat-hanger shaped gadget holds it all together.

The pulley's dowel axle is mounted at an angle in the head so that the pulley is on a direct line with both the control rod hook and the blinker's coat hanger gadget. The axle is not straight across and horizontal because the control rod does not come up the center of the head. It is mounted on the left of the headstick and comes up toward the left side. This is also why the U-shaped protrusion is not in the center of the eyeball synchronization bar.

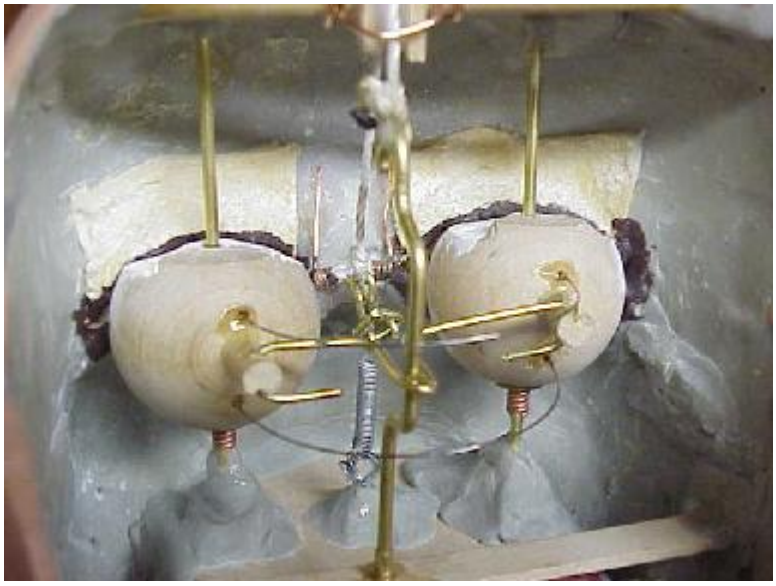
Observe that the eyeballs are carved flat at the top. I had to make this modification to make room for the blinkers to retract.

Don't ask where you can find nylon pulleys such as the one I used here. I found a bunch of them in my father-in-law's garage. No one knows where they came from. The hole in the pulley is just the right size for the 1/4" dowel axle. The spacers that keep the pulley from sliding are made from basswood and glued to the axle with Elmer's.

The string is nylon cord. You must prevent the string's knots from slipping and creating slack. I knotted both ends and set fire to them with a match. The melted nylon knot forms a tight, long-lasting connection.

Self-Centering Eyes

The following picture shows the mechanism with the self-centering eyes feature added. Two very thin steel spring rods connect to the backs of the eyeballs. I drilled tiny holes into the wooden balls, inserted the ends of the springs, and fastened the springs to the balls with epoxy. The springs are curved so that when the eyes turn to the left or right, the springs warp. Their tensile strength make them want to be straight. As they try to straighten themselves from the warped shape, they return the eyes to the center position. I used two springs to increase the resistance on the control to what I like to feel.



The Finished Figure

Here are some snapshots of Toby, the finished figure with the one-finger control.