THE MYSTERIOUS WHIMMY DIDDLE

In the Appalachian Mountains, where this toy dates back hundreds of years, it is called a Whimsy Diddle. Thousands of wooden versions are sold each year, and a Gee Haw Whimsy Diddle Competition is held every summer at Asheville’s Folk Art Center. “Gee” is the propeller’s spin to the right, and “haw” is its spin to the left.

You need:
2 pencils
A file
A pin
A rectangular piece of cardboard

The Whimsy Diddle is easy to make.
Cut notches along the edge of a pencil. Stick a pin through the center of the cardboard and attach it to the pencil’s eraser, as shown in the top figure. The hole in the “propeller” must be a bit larger than the pin, in order to cut down friction.
Hold the end of the pencil in your left hand. With your right hand, rub the second pencil back and forth across the notches as shown. If the tip of your first finger slides along the right side of the notches, the cardboard propeller will rotate rapidly in the “gee” direction. If you move the rubbing pencil a trifle forward so that the tip of your thumb now slides along the left side of the notches, the propeller will stop and whirl the “haw” way! The movement of your right hand is undetectable. This allows you to command the propeller to rotate first one way, and then the other, without revealing how you do it.
Why does it work?
The spin of the propeller is caused by horizontal or back and forth vibrations in the notched pencil as you run the second pencil over it. These horizontal vibrations have a specific oscillation pattern that creates vertical or up and down vibrations in the pin. The pin’s vertical vibrations take the form of circular or elliptical motion, and this motion causes the propeller to spin.
When you hold a finger against the left side of the notched pencil, you force the horizontal vibrations to travel in one direction and create vertical vibrations in the same direction. This causes the propeller to spin “gee,” or left. When you hold a finger against the right side of notched pencil, the vibrations travel in the opposite direction and cause the propeller to spin “haw,” or right.