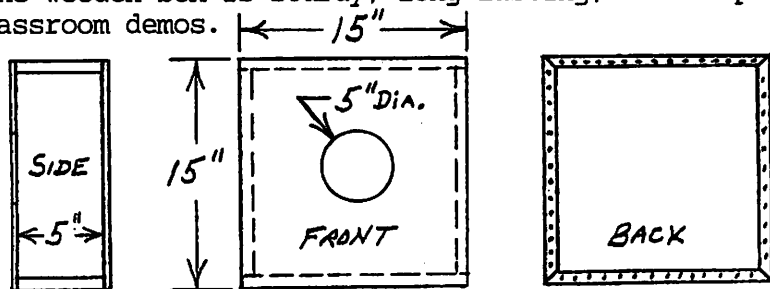


The vortex box (W. Hilton design) and smoke machine (VMI design).

The wooden box is sturdy, long-lasting, and simple to build. It produces a good vortex for classroom demos.

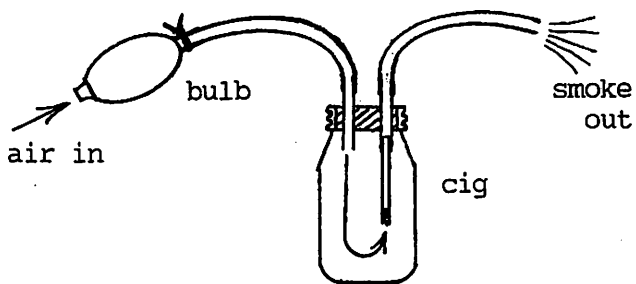


3/4" thick pine or plywood sides

1/8" thick masonite front

vinyl upholstery cloth back, stretched, and fastened down with 3/4" wide lath

If you want to see the vortex (the smoke ring), you must add smoke of somekind. Still the simplest and best smoke I have seen is from the old, "dirty" (no filter) cigarettes, like Pall Mall, Chesterfield, Camel, etc. Thus, you need a "smoke" machine or cigarette smoker. The simplest and best design I have seen uses a 1 pint mayonnaise jar with lid and an air pump (rubber bulb with pressure valve by SK, #62839-01 or pressure rubber bulb by S-W, #WLS-73125).



2 3/8" O.D. Cu tubing, 2" long

2 5/16" I.D. rubber tubing, 9" long

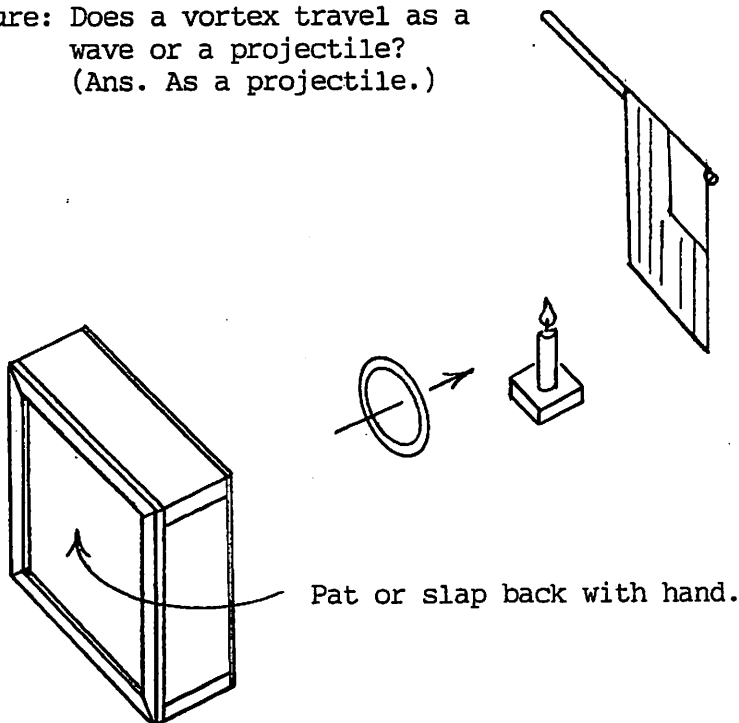
1 #18 Cu wire twist, 2 1/4" long

3 #8 x 1/2" panhead screws

1 1/2" thick plywood disc with two 3/8" holes drilled through it

**Warning:** If you use cigarette smoke in this demo (or any other smoke for that matter), advise your students beforehand so adjustments can be made. You should perform this demo at the end of the class period when you can immediately ventilate the room (open windows?) as the students leave. Actually, less than one cigarette is required to perform the demos (b) and (c) below. By all means, never aim a smoke ring at a student.

Procedure: Does a vortex travel as a wave or a projectile?  
 (Ans. As a projectile.)



- (a) Use a flag as a target at a distance without smoke.
- (b) Send smoke rings passing through a light beam above the students toward the ceiling.
- (c) Try to blow out a candle flame at a moderate distance. You may need smoke to help you aim at the target.