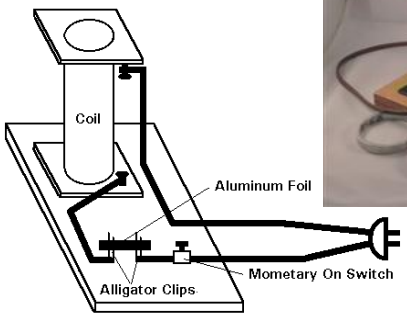
MAGNETIZER AND ELIHU THOMPSON APPARATUS

Materials:

Coil, PSSC (such as S52051- Fisher Scientific)
Alligator Clips (2)
Momentary-on Switch (Radio Shack-_____)
Connecting wire
Male AC plug
Board - (24 x 10 x 2 cm)
plexiglas
silicon sealer
Aluminum Foil
Sheet metal screws (2)
Flat headed bolts _____ (2)



Construction:

1. Drill two hole in base of coil. Mount coil on wood base.
2. Drill and tap 2 holes through board on alligator clips will be placed. Screw in bolts from bottom side of board. Counter sink bolts into board. Slide alligator clips on bolts.
3. Mount momentary-on switch to board.
4. Connect terminals as shown. Make sure no open wires exist by covering with silicon sealer.
5. Make a make a plexiglas box that covers the two alligator clips.
6. Cut aluminum strips 3 mm wide by a length long enough to connect the two alligator clips. Note...One can replace the aluminum foil with a diode and circuit breaker. (Make sure that the current that the diode can carry is greater than the circuit breaker.)

Caution:

As we are using 120-volt A.C. current, potential danger exits if one does not use extreme care when using.

Operation:

1. Place a piece of aluminum foil between the two alligator clips.
2. Place plexiglas box over alligator clips and coil. **CAUTION!!** -- **Always do this!!**
3. Place magnet in coil.
4. Press and hold stitch until aluminum foil melts and breaks the circuit.
5. Remove magnet and check for correct polarity with compass. If polarity is not correct repeat steps three, four and five.

References:

1. Participant sharing notes by David Kock - PTRA 1986
2. Vincent Buckwash, *Rejuvenating Bar Mangets* The Physics Teacher 13, 559 (1975)

Converting to an Elihu Thompson Apparatus

Materials:

Cardboard tube from paper towels. (Must fit in coil and be approximately twice as long.)
Coat hangers

Construction:

1. Straighten hangers and cut to length of cardboard tube. Pace in tube. Continue until tube is full. How many will you need? My guess is that it will be many more than you will first estimate.
2. Cut two 1-cm high aluminum coils from a piece of aluminum pipe. Coil must fit over cardboard tube with coat hanger rods.
3. Cut one of the two coils in one place.

MAGNETIZER AND ELIHU THOMPSON APPARATUS

Operation:

1. Place cardboard tube with coat hanger rods in coil.
2. Place piece of aluminum foil between the alligator clips.
3. Place plexiglas cover over aluminum foil and alligator clips.
4. Place solid aluminum ring over the cardboard tube.
5. Press switch. (Do not have head directly over coil when pushing the switch.)
   What happened to the aluminum coil? What principle is demonstrated?
6. Place aluminum ring that has been cut over the cardboard tube.
7. Press switch. Why did the coil perform as it did?
8. With cut aluminum ring over the cardboard tube, connect one connecting wire from a voltmeter to one end of the ring (near cut) and other wire to other end (near cut).
9. With voltmeter set on most sensitive setting, press and hold switch on.
10. How many volts do you read on the meter? _____
11. What concept if being demonstrated?

TRANSMISSION OF SOUND

Materials:

Tape recorder and musical tape
Connecting wires (connect tape recorder to coil)
Second Coil
Speaker
Connecting wires (connect speaker to coil)

Construction:

1. Prepare wire that connects tape recorder (monitor output) to terminals on coil fastened to board.
2. Prepare wire that connects speaker to terminals of second coil.

Operation:

1. Place tape in tape recorder and turn it on. Make sure sound is coming from the tape recorder.
2. Connect tape recorder to coil on board.
3. Connect speaker to second coil.
4. Bring second coil near the first coil. As you do listen for music.
5. Slowly place the second coil over the cardboard tube until it is setting on the first coil. Results