CONSTRUCTION OF A STILL-AIR INCUBATOR

An attractive, inexpensive incubator can be constructed by used cardboard boxes as the basic construction material. This design uses a light bulb as a source of heat and a commercial thermostat to regulate the temperature. As a source of moisture, a cake pan filled with water works fine.

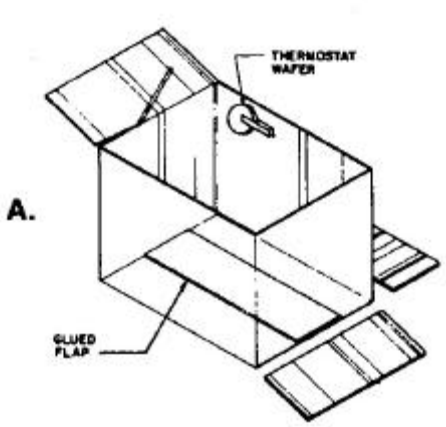
Materials and Supplies

All the dimensions mentioned below must be adjusted to the size of the boxes used and are only suggested sizes.

1 box 18" long x 14" wide x 13" high (corrugated cardboard)
1 box 16" long x 12" wide x 12" high (corrugated cardboard) (the larger box should be 2" greater in both length and width and 1" higher)
1 sheet glass 18" x 14" (size of larger box)
0.5" hardware cloth 20" x 16" (4" wider and longer than the smaller box)
Light socket (porcelain)
Electric cord, 7' to 20' in length
Male electric plug
Water pan (cake pan should cover at least half of the bottom of the smaller box)
Light bulb (60-75 watt)
1: making tape (freezer tape)
Glue
Brads or small bolts
Insulating material (newspapers, whole or shredded)
Screwdriver
Tin snips (wire cutters)
Pencil
Knife and /or scissors
Yardstick (ruler)
Block of wood 0.75" x 4" x 4"
Round rolled oats box or fruit juice can (this acts as chimney around light)
Aluminum foil (to line inside of box)
Newspapers for bottom–should be several layers
Thermostat (wafer or solid state types)
Thermometer

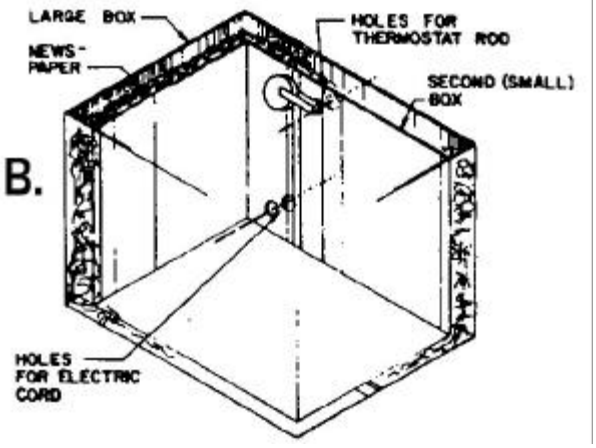
CONSTRUCTION

Cut flaps from smaller box and attach the thermostat to one of the longer sides making sure that the wafer clears the upper edge by at least 0.25". A portion of one of the flaps can be glued to the bottom of this box to fill in the space where the inner flaps do not come together. See Diagram A.



Apply glue on the inside of the bottom around the center portion of the larger box. Now center the smaller box inside the larger box and place a weight in the bottom to ensure bonding. There should be at least 0.5" to 1" between the sides of the inner and outer boxes. Make a hole through both boxes for the rod that holds the wafer of the thermostat (be sure that the alignment is correct). This may not be necessary for solid state thermostats. Make another hole through both boxes 1: from the bottom and centered so that the electric cord can pass through it.

Lightly stuff the area between the boxes with insulating material (newspapers are fine–whole or shredded in strips). Do not bulge sides. See Diagram B.

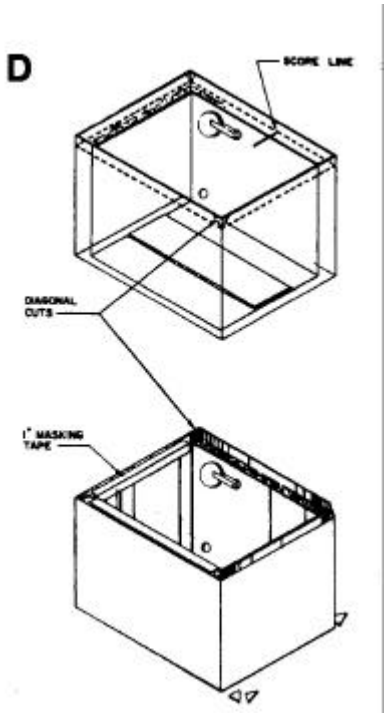


Draw a line all the way around on the outside of the larger box at the level of the upper edge of the smaller box. With a knife or single edged razor blade, cut along this line. **Make sure the cut only goes through the outer cardboard layer and nicks the corrugated portion.** ***It must not cut through the inner layer of cardboard.***

Make diagonal cuts in corners of the larger box so the flaps will fold neatly. See Diagram C.

Fold the flaps inward along the cut portion.

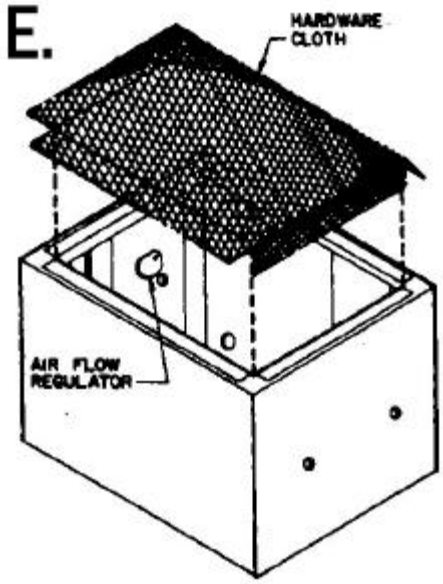
Mark these flaps where they come in contact with the inner edge of the smaller box and cut along these lines. See Diagram D.



Tape the flaps with 1: masking tape to the edge of the smaller box. Cut a piece of hardware cloth (0.5" mesh) so that it is 4" wider and 4" longer than the inside diameter of the smaller box.

Using the tin snips, cut a 2” square from each corner of the hardware cloth. Then bend the projecting pieces of cloth so they form legs to support the screen. It should fit snugly in the bottom of the box. See Diagram E.

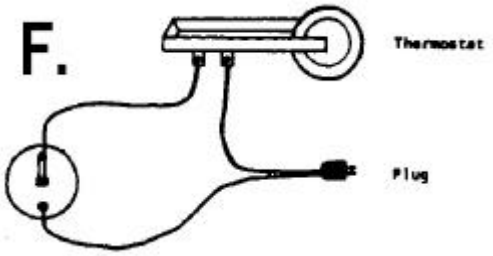
E.



Cut 4 ventilation holes (1” in diameter) where they will be level with the top of the eggs. Cut ventilation hole covers that are 1.5” to 2” out of extra cardboard to regulate airflow and attach to the inner box with brads or small bolts.

Wire the light socket so that electricity flows through the thermostat. See Diagram F.

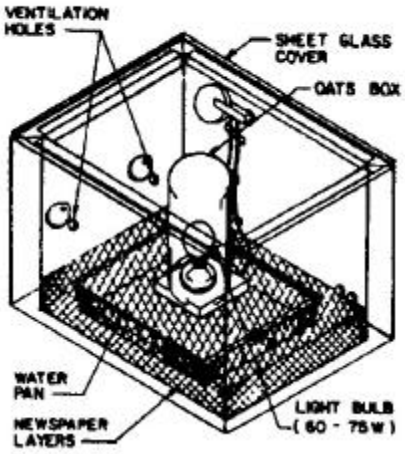
F.



The light socket should be attached to a wooden base (0.75” x 4” x 4” block). Heating coils of various types may be substituted for the light bulb as a heat source.

Line the box with heavy duty aluminum foil, place several layers of newspaper in the bottom, place cake pan under screen, assemble thermostat on back wall, insert light bulb and place rolled oats box or juice can around light. See Diagram G.

G.



Regulate temperature so that it ranges between 101 degrees and 103 degrees F (38.3 to 39.4 degrees C) approximately 2 inches above the screen (or top of the egg). Check unit periodically for several hours to make sure it is functioning properly before setting eggs.

Place eggs on hardware cloth around the light. Cover the top of the box with glass.

Other Construction Notes:
Small electric fans can be installed incubators to circulate the air and maintain a more uniform temperature and humidity. Incubators with fans should be operated at 99.5 degrees F (37.5 degree C).

Small incubators may also be constructed from Styrofoam coolers. Ventilation holes, egg holding screen, water pan, thermostats, heat source, etc. are installed as with the cardboard structure.

To construct a more permanent type of incubator, construct the box using 0.5” or 0.75” waterproof or marine plywood. Protect the wood with two or three coats of polyurethane finish. This also will permit easy cleaning and disinfect ion of the incubator.

See page 5 for other notes regarding your incubator.