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Inexpensive Polyvinyl Chloride Egg Incubation Jar

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Abstract.—A design is presented for building an inexpensive (US$35) egg jar from polyvinyl chloride (PVC) parts. The unit has been used successfully to incubate eggs of rainbow trout (*Oncorhynchus mykiss*) to the eyed stage.

Holland and Libey (1980) presented an inexpensive egg-hatching jar made of plexiglass pipe and a plastic bowl. Another inexpensive design featured a plastic soft-drink bottle with plastic pipe components (Rottmann and Shireman 1988). These jars are primarily for small numbers of eggs.

Jars for incubating large numbers of fish eggs to the eyed stage of development are commercially available for about US$248. We present a jar con-

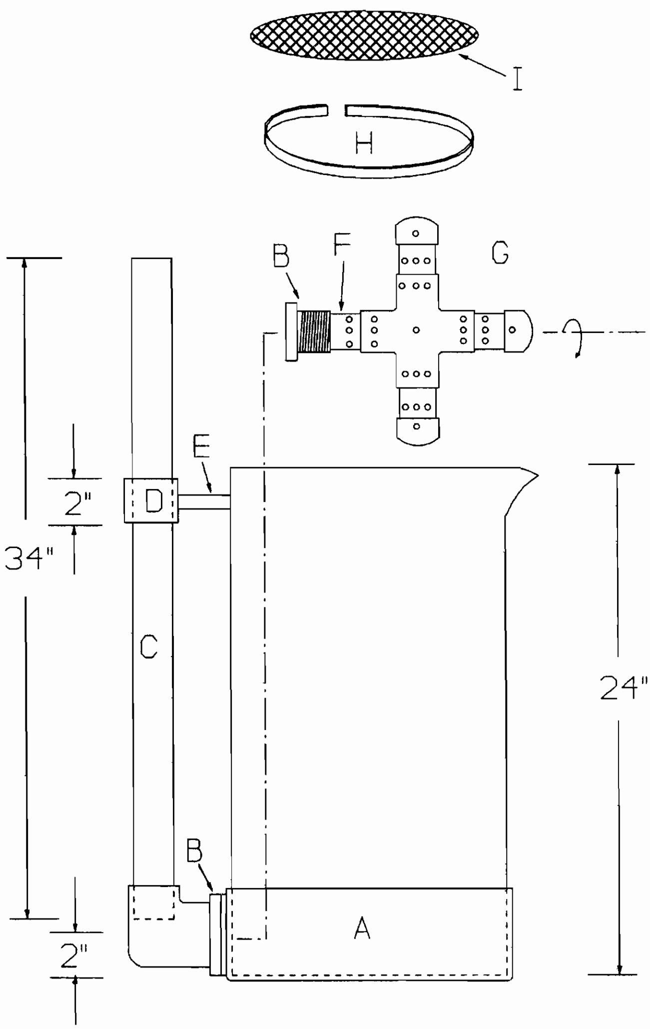

FIGURE 1.—Schematic of the PVC egg jar, featuring an end cap (A), tank adaptor (B), standpipe (C), support ring (D), bolt sleeve (E), hand-threaded pipe (F), water distribution cross (G), screen support ring (H), and screen (I).

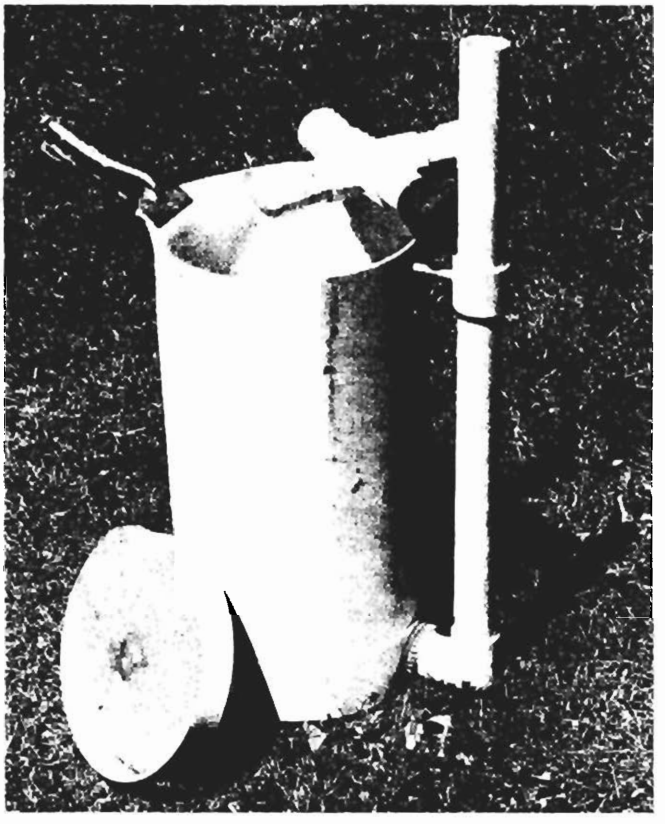

FIGURE 2.—A PVC egg jar showing pliers used to form the overflow lip.

structed principally of polyvinyl chloride (PVC) parts that can be built in 1–2 h for US$35 worth of materials (Figure 1). We have used the jar to successfully incubate about 300,000 eggs of rainbow trout (*Oncorhynchus mykiss*) with 87–93% survival to the eyed stage of development.

To build the unit, a 12-in end cap (Figure 1, A) is glued to a 24-in section of 12-in-diameter PVC schedule 40 pipe. A water overflow is formed by carefully heating the 12-in pipe and bending the plastic with sheet metal pliers to form a lip (Figure 2). A 2¼-in hole is centered and drilled 2 in from the bottom. A tank adaptor (1½ in inside diameter; Figure 1, B) is fitted to the hole and a 3-in section of 1½-in PVC pipe attaches the elbow (90°) and standpipe (34 × 1½ in; C) to the unit.

The standpipe, where water enters, makes a convenient handle for carrying the jar. To strengthen this handle, a 2-in section of 2-in PVC pipe (D) is bolted (3 × 1¼-in bolt with a countersunk head) to the jar and reinforced with a 2¼-in section of ⅝-in pipe (E) slipped over the bolt. The standpipe should slip easily inside the 2-in ring now formed.

To distribute the water within the jar, four 3½-in sections of 1½-in PVC pipe are glued to a four-way PVC cross. One of these sections (F) is threaded with a 1½-in pipe threader to fit the tank adaptor. The outer three ends are capped. Twenty-eight holes are drilled (⅛-in diameter) as shown in Figure 1, G. The holes are positioned face down, creating an upwelling effect. Water flow through jar, about 3 gal/min, is adjusted so that the eggs are on the verge of rolling.

To provide a surface for the eggs to rest on, a screen (1/16-in perforated sheeting with 23% open area and 0.063-in thickness) is placed on a support ring inside the jar (H, I). The ring is made from a 1½-in section of 12-in PVC pipe; a short section is cut out such that the ring will fit snugly inside the jar. The ring also serves to keep eggs from falling through the space between the screen margin and the jar wall. The size of the mesh needed varies with the size of the egg: nine meshes per inch for eggs that are 400–700/oz; five meshes per inch for eggs that are 60–90/oz (Piper et al. 1986).

The opaque walls make it difficult to see the eggs or fungus growth, but the prophylactic treatments obviate the need for visual inspection laterally. The opacity also protects the eggs from the lethal effects of light (Perlmutter and White 1962; Piper et al. 1986).

References

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