SIMPLE MOTOR-DRIVEN DEVICES FOR FEEDING AND WATERING ANIMALS¹

WILLIAM F. CROWDER, WILLIAM P. WILKES, AND BEN D. HUNEYCUTT

UNIVERSITY OF MISSISSIPPI

The devices described here provide a convenient way to make water or food available for specified amounts of time, when remote control or automatic programming is desired. Their main components are a bottle or food hopper, mounted on a hinged panel; a motor; two or more limit switches, which are activated by a striker on the motor shaft; and, attached to the motor shaft, a cam or crank which

moves the panel. The panel is hinged at its top and, under the weight of the attached bottle or hopper, tends to bring the food or water within the subject's reach. The edge of the panel rests against the crank, which normally holds it away from the cage (Fig. 1, left side). The limit switches (normally-closed leaf-type microswitches) are typically positioned 180 degrees apart. When voltage is applied to one of them, the motor runs until the striker opens that switch, moving the panel from the "out" to the "in" position. When voltage is applied to the other limit switch, the shaft

¹The development of this apparatus was supported by Grant No. MH 04988 from the National Institutes of Health.

Fig. 1. Motor-driven watering devices.
Left: One-bottle apparatus. Right: Two-bottle apparatus.
Center: Driving unit for one-bottle apparatus.

rotates another 180 degrees, returning the panel to its "out" position.

The motor, switches, and terminal strip are mounted on a 5 in. by 6 in. Masonite board. This assembly, removed from a cage, is shown in the center of Fig. 1. The wooden block located between the microswitches is used to attach the assembly to a cage. The crank is made from a $\frac{1}{2}$ -in. square metal rod, $1\frac{1}{4}$ in. long, which mounts on the motor shaft and is secured by a pair of set screws, one of which also serves as the microswitch leaf striker. To complete the crank, a machine screw is fastened parallel to the motor shaft but through the opposite end of the rod. The motor is a 14 rpm induction gear motor, manufactured by Electro Counter and Motor Co., Chicago, Ill. Similar motors manufactured by Merkle-Korff Gear Co. and by Brevet Products Corp., are sold in a variety of speeds by

Herbach and Rademan, Inc., Philadelphia, Pa. Care should be taken to select a motor which does not coast so far in stopping that the striker goes on past the limit switch. Palley Supply Co., Los Angeles, Calif., lists a high torque, 25 rpm motor having a magnetic brake for rapid stopping (Stock No. 5K209P, \$8.97).

A device for presenting either or neither of two bottles is shown on the right in Fig. 1. Here a connecting rod couples the crank to the right-hand panel and another rod couples the two panels so that they move together. When voltage is applied to the left-hand limit switch the crank revolves until that switch is opened, stopping the motor with the left-hand bottle accessible, as shown. Similarly, when voltage is applied to the right limit switch, the right bottle is presented. After voltage is applied to either the top or the bottom switches, neither bottle is accessible.