

**MODIFICATION OF NEW JERSEY  
LIGHT TRAP FOR  
MULTIPLE SAMPLE  
COLLECTION**

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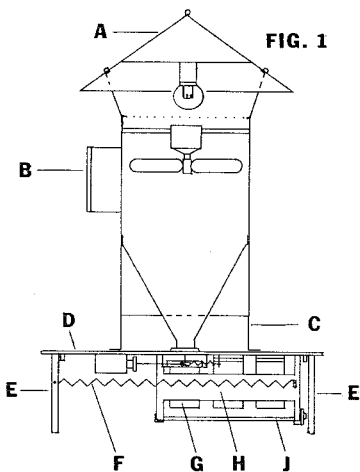
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The Desplaines Valley Mosquito Abatement District situated in the western suburbs of Chicago, Illinois has utilized a network of standard New Jersey type light traps to monitor adult mosquito activity since 1941. Prior to 1977, individual nightly trap samples were limited to those nights where physical collections by laboratory staff could be made on the following morning. Weekend samples, typically from Friday to Sunday night, were combined into one killing bottle by nature of the New Jersey type trap. Partition type traps of either the falling disc (Horsfall 1962) or turntable type (Standfast 1965) were available for multiple sample collection, and in part provided the basis for this undertaking. An apparatus for

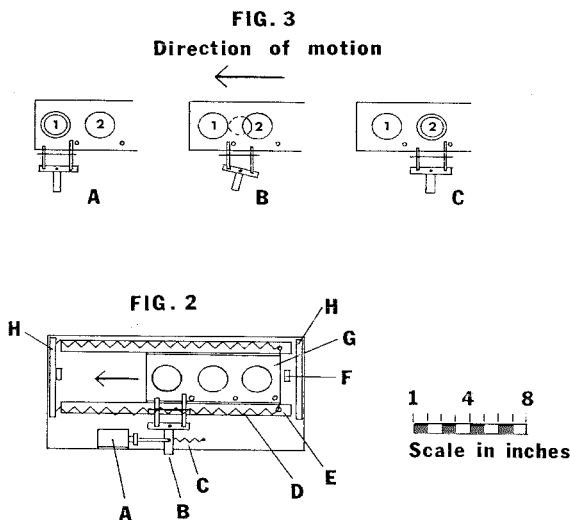
multiple sample collection, specifically for three 24-hr periods, is described.

A standard New Jersey type light trap is positioned over an apparatus (Figs. 1 and 4) which changes the killing bottle at designated 24 hour intervals. The apparatus is electrically controlled by an escapement mechanism (Standfast 1965) with linear motion of the bottle carriage in lieu of previous turntable styles.

The main plate and bottle carriage are fabricated from 1/8" thick aluminum plate for durability to weather exposure, yet minimizing component weight factors. The basic configuration of the bottle carriage is indicated in Figs. 2 and 5. A hinged cover is included on the carriage to prevent unauthorized tampering with samples collected. The carriage slides along the base of the main plate along two parallel "tracks" constructed of 1" x 1/8" flat aluminum strips positioned equidistant from the plate surface by a 1/2" x 3/16" flat aluminum strip sandwiched between the wider strip and main plate. Two 1/2" x 3/16" flat aluminum strips are bent to a flat-bottom U configuration and attached at each end of the main plate to



**FIG. 1**



**FIG. 3**

**Direction of motion**

**FIG. 2**

**Scale in inches**

Fig. 1. Diagrammatic representation of light trap modification; A. New Jersey light trap, B. timer switch, C. light trap leg, D. main plate, E. support leg, F. bottle carriage spring, G. killing bottle, H. bottle carriage, J. security cover.

Fig. 2. Diagram of modification components, bottom view; A. solenoid, B. escapement mechanism, C. escapement return spring, D. bottle carriage spring, E. track, F. carriage stop, G. bottle carriage with security cover removed, H. support leg.

Fig. 3. Sequence of operation; A. solenoid in open position, B. solenoid activated in closed position, C. solenoid returns to open position.

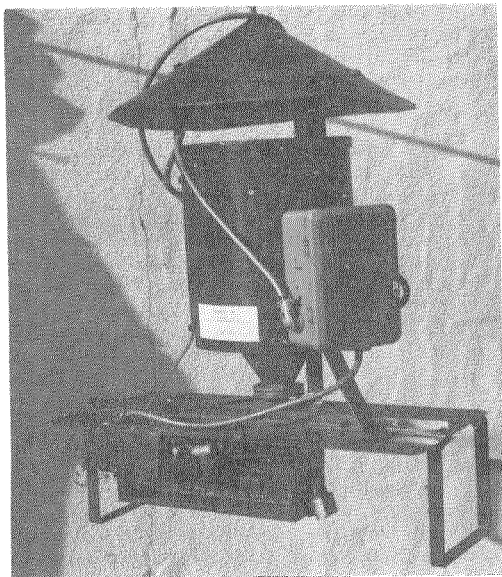


Fig. 4. New Jersey type light trap positioned over collection apparatus.

serve as attachment points for the linear springs and as support legs for the trap during periods of transport or winter storage.

Two linear springs provide the source of motion to the bottle carriage. An escapement type mechanism controls carriage motion per sequence indicated in Fig. 3. The solenoid (Dormeyer #2536-M-1 with one  $\frac{1}{16}$ " stroke) indicated operates on 120 VAC. When the solenoid closes, the carriage advances until it is stopped by pin 2 of the escapement mechanism. When the solenoid opens, the carriage continues its cycle until it is stopped by pin 1. At this point, the next killing bottle is aligned with the hole in the main plate.

The solenoid is controlled by a microswitch (Unimax #2TMT15-4 with standard lever) located within the main time switch box on the light trap. The basic time switch (Inter-Matic #T171 "Skipper") utilized is of a commercially available selective day of operation style. Although various configurations of time switch are available, all utilize a secondary "day wheel" which advances one position every 24 hr and into which pins or the equivalent are inserted to eliminate specified days of operation. Although this feature is not desired for daily operation of the light trap, minor modification to shorten these pins will bypass their intended function.

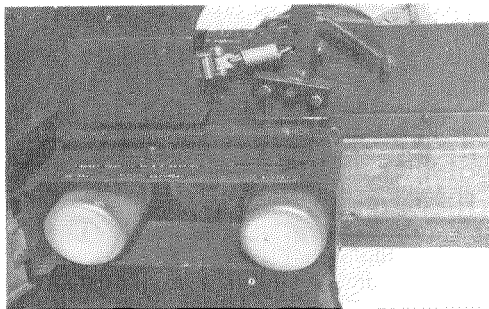


Fig. 5. View of escapement mechanism and bottle carriage.

These pins provide a convenient contact point for a microswitch located adjacent to the wheel. Thus the modified pins are used exclusively to control bottle carriage transfer at any designated 24 hour interval. The only human intervention necessary is a manual setting of the bottle carriage to position 1 prior to desired operation.

Ten New Jersey type light traps were modified by our District during 1977 as outlined. The traps were modified as described for under \$50 each, with all materials obtained through a larger hardware store. The traps have operated without fault to date. Yearly, pre-season inspections were made of all traps with necessary cleaning and lubrication of all pivot and slide points.

The apparatus described is not limited to the standard New Jersey type light trap. It can easily be adapted to the American style trap (Mulhern 1953) or made smaller for use on CDC or other live-catch style traps. The apparatus described was designed for specific collections over typically unattended weekend periods. However, flexibility exists to expand both interval and number of collections for specific program needs.

#### References Cited

- Horsfall, W. R. 1962. Trap for separating collections on insects by (time) interval. *J. Econ. Entomol.* 55:808-11.
- Mulhern, T. D. 1953. Better results with mosquito light traps through standardizing mechanical performance. *Mosq. News* 13:130-33.
- Standfast, H. A. 1965. A miniature light trap which automatically segregates the catch into hourly samples. *Mosq. News* 25:48-53.