

Nov. 14, 1944.

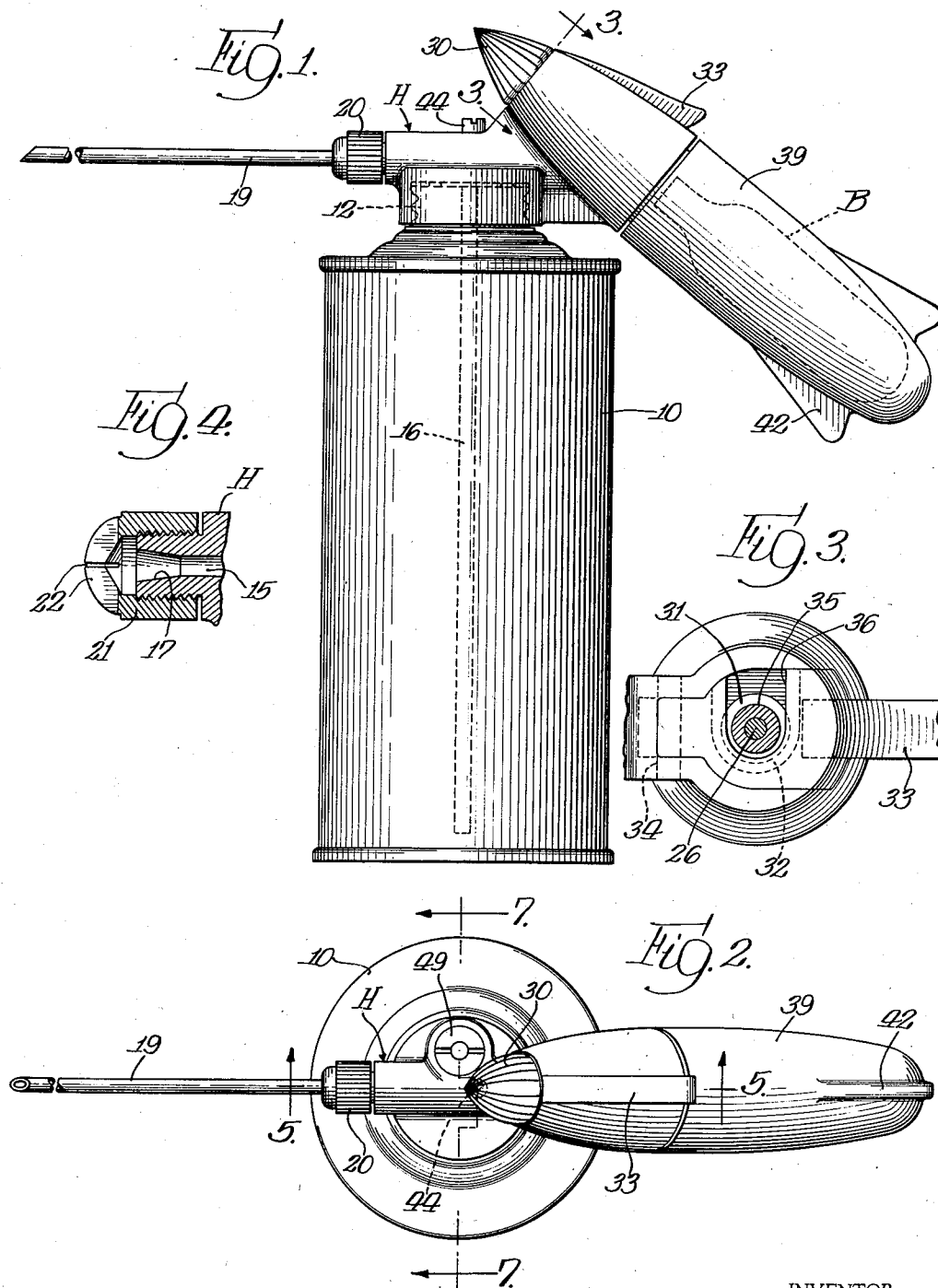
L. T. WARD

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INSECTICIDE SPRAY HEAD VALVE

Filed Nov. 10, 1941

2 Sheets-Sheet 1



INVENTOR.
Lawrence T. Ward,
BY *Bain & Dreeman*
Attys.

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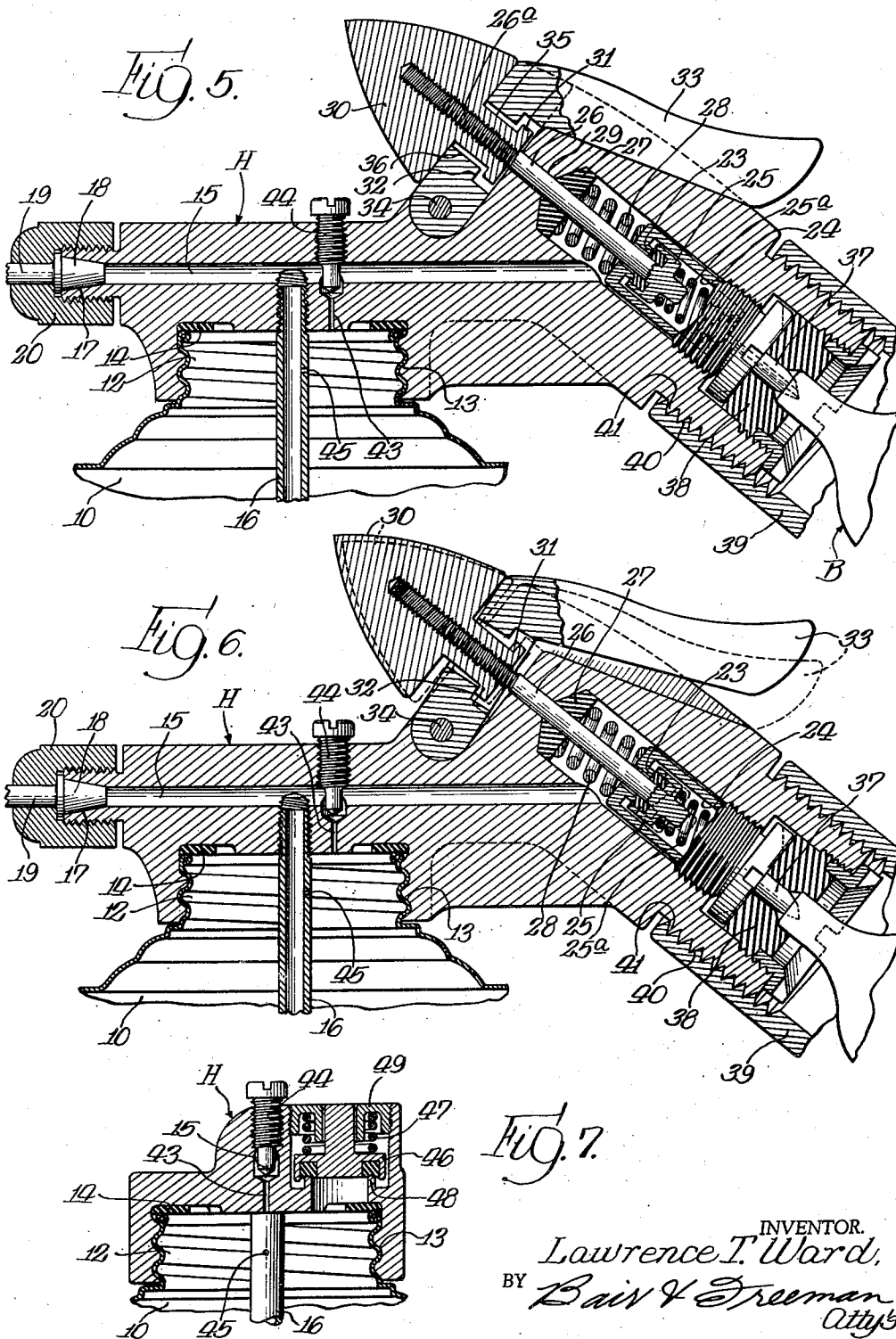
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Lawrence T. Ward,
BY Bain & Freeman
Attys.

UNITED STATES PATENT OFFICE

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INSECTICIDE SPRAY HEAD VALVE

Lawrence T. Ward, Philadelphia, Pa., assignor
to Knapp-Monarch Company, St. Louis, Mo., a
corporation of Missouri

Application November 10, 1941, Serial No. 418,474

4 Claims. (Cl. 251—134)

My present invention relates to a spray head valve unit for mounting on insecticide cans and the like.

One object of the invention is to provide a compact unitary structure which may replace the lid of a standard screw-top insecticide can and includes all the necessary mechanism for dispensing the insecticide in spray form from the can.

Another object is to provide a spray head unit which has a control valve and a pressure bulb piercing means whereby a pressure bulb, such as a carbon dioxide bulb, may be mounted in such manner as to communicate with the valve, the valve being operable to control the flow of pressure for dispensing the insecticide in the form of a spray.

Still another object is to provide a positive lock nut means for locking the valve tightly in closed position when the device is not in use, thereby conserving the pressure of the pressure bulb.

A further object is to provide a unit of the class disclosed with which a full can of insecticide may be connected when the old one is emptied and a fresh pressure bulb may be inserted for an empty one, independent of each other.

Still another object is to provide a needle valve for controlling the flow of pressure into the insecticide can so as to limit such pressure to one that will not be excessive and thereby fracture the can.

Still another object is to provide a safety feature in the form of a pressure relief valve built into the spray head for relieving excess pressure from the container or can, if such excess pressure is inadvertently admitted thereto.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my device whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying drawings, wherein:

Figure 1 is a side elevation of an insecticide spray head unit embodying my invention and showing it mounted on a can or similar container of insecticide or the like;

Figure 2 is a plan view thereof;

Figure 3 is an enlarged sectional view on the line 3—3 of Figure 1;

Figure 4 is an enlarged sectional view of a spray nozzle different from the one shown in Figures 1 and 2;

Figure 5 is an enlarged sectional view on the

line 5—5 of Figure 2, showing the control valve locked in closed position;

Figure 6 is a similar sectional view showing the control valve unlocked for operation; and

Figure 7 is an enlarged sectional view of the line 7—7 of Figure 2, showing a pressure relief valve.

On the accompanying drawings I have used the reference numeral 10 to indicate a can or other suitable container for insecticide or the like. The can 10 has a screw-threaded neck 12. My spray head unit is indicated generally at H, the head H being provided with threads as at 13, to detachably coact with the threaded neck 12. A gasket 14 is provided for sealing purposes.

The head H has therein a passageway communicating intermediate its ends with a depending syphon tube 16. The front end of the passageway is tapered, as indicated at 17, to coact with a tapered head 18 of a tube-like nozzle 19. The nozzle 19 is held in position by a threaded sleeve 20. The nozzle 19 is adapted for thrusting it into the cracks of upholstered furniture and the like, whereas, for general spraying into the atmosphere, another nozzle may be provided. Such nozzle is indicated at 21 and consists of a sleeve similar to the sleeve 20, but with cross-slots 22 to take the place of the nozzle tube 19.

The rear end of the passageway 15 communicates with a valve seat 23 formed on a sleeve 24 threaded into the head H. Coacting with the valve seat 23 is a valve plug 25 formed on a valve stem 26. The valve stem 26 extends through the seat 23 and through a packing washer 27. The packing washer 27 is retained tight by a spring 28.

The stem 26 further extends through a guide bore 29 of the head H and terminates in a threaded portion 26^a on which a lock nut 30 is threaded. The lock nut 30 has a flange-like shoulder 31 adapted to be engaged at times by a shoulder 32 of a valve operating lever 33. The operating lever 33 is pivoted on a pin 34. The shoulder 31 is connected with the lock nut 30 by a sleeve 35. The sleeve 35 passes through a U-shaped notch 36 (see Figure 3) in the lever 33.

The sleeve 24 carries a hollow piercing pin 37 surrounded by a packing washer 38. The pin 37 is adapted to pierce a pressure bulb B when such bulb is pressed thereagainst by a bulb holder 39. The bulb holder 39 is threaded at 40 to coact with threads 41 of the head H, and is provided with a pair of wings 42 to facilitate the operation of threading the holder onto the head for piercing the bulb B. After the bulb is pierced, it is sealed relative to the valve plug 25 by the

packing washer 38 against leakage of the pressure therefrom to atmosphere.

Pressure is introduced into the container 10 through a passageway 43. The passageway 43 is controlled by a needle valve 44. The syphon tube is also provided with a capillary opening 45, the purpose of which will hereinafter appear.

In Figure 7 I show a relief valve 46 in the form of a plug seated by a spring 47 against a seat 48. The seat 48 communicates with the interior of the can 10, whereas the outside and top of the valve plug 46 communicates with atmosphere through a bore of a closure plug 49.

Practical operation

In the operation of my insecticide spray head unit the cap that usually comes on the can 10 is unscrewed and replaced by the unit. A pressure bulb, such as a "Sparklet" bulb is then inserted in the bulb holder 39, and the holder is screwed onto the head until the piercing pin 37 communicates the interior of the bulb with the space in the sleeve 24 surrounding the valve plug 25 (see Figure 5). The lock nut 30, it will be noted, is screwed down tightly during the bulb piercing operation so as to positively seat the plug 25 against the seat 23.

The lock nut 30 is then loosened as it is in Figure 6, so that the spring 25^a behind the valve plug 25 retains the valve plug seated, and the operating lever 33 moves out to the full-line position. Thereafter, the lever 33 may be depressed to the dotted position, which will open the valve 25 to permit fluid pressure to enter the passageway 15. Such fluid pressure is divided so that most of it passes out through the nozzle 19 or 21, and a portion passes the needle valve 44 and flows through the passageway 43 to place the contents of the can 10 under pressure to force it upwardly through the syphon tube 16. As the insecticide or other liquid flows upwardly through the tube 16, some of the fluid pressure passes through the opening 45 to mix therewith to partially atomize the liquid, fluid pressure flowing through the passageway 15 completing the atomizing operation.

The needle valve 44 is adjusted to a position where it will introduce the proper proportion of fluid pressure through the passageway 43 in relation to that passing through the passageway 15. If such pressure is excessive, it will be relieved through the relief valve 46 rather than distend the can and possibly fracture it. If, during operation, the relief valve 46 should operate, it is an indication that either too much fluid pressure is passing through the passageway 43, or the passageway 15 forward of the passageway 43 has become clogged. In the first case, the needle valve 44 should be screwed down slightly, whereas in the latter case, it is necessary to clean out the passageways. The relief valve 46 is insurance against clogged passageways resulting in disten-

tion and fracture of the relatively light can 10, usually made of tin.

The spray may be nicely regulated by the position of the lock nut 30 with respect to the stem 26. The farther out the lock nut is rotated, the wider the valve 25 will open when the operating lever is moved from fully closed position to the dotted line position of Figure 6.

Some changes may be made in the construction and arrangement of the parts of my device without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope without sacrificing any of the advantages thereof.

I claim as my invention:

1. A dispensing valve comprising a head having a passageway, a valve communicating with said passageway, said valve including a valve seat, a valve plug and a stem connected with said valve plug, a lock nut on said stem, an operating lever pivoted to said head and engageable with said lock nut to open said valve, said lock nut being adjustable to a position positively locking said valve closed independent of said operating lever.

2. In a valve structure of the class described, a head having a passageway therethrough, a valve in said passageway, said valve including a valve seat, a plug and a stem for said plug, and a lock nut threaded on said stem, an operating lever engageable with said lock nut to open said valve, said lock nut in one position moving said lever to its normal valve open position and simultaneously positively locking said valve closed.

3. In a valve structure, a head having a passageway, a valve seat in said passageway, a valve plug and a stem therefor, a lock nut on said stem having a shoulder, an operating lever pivoted to said head and engageable with said shoulder to open said valve, said lock nut being threaded on said stem for adjustment to a position seating said valve plug against said valve seat and the valve thereby closed and against opening by said operating lever.

4. In a dispensing valve unit, a head, first and second passageways therein, a valve seat between said passageways, a stem extending through the valve seat and to the exterior of said head, a plug carried by said stem to seat on the valve seat and a spring to effect such seating thereof, a lock nut on said stem outside of said head and having a shoulder, an operating lever coactable with said shoulder to open said valve against the constraint of said spring when said lock nut is screwed to position spaced from said head, said lock nut being adjustable to a position engaging said head and thereby positively locking said valve against opening by said operating lever.

LAWRENCE T. WARD.