

March 4, 1941.

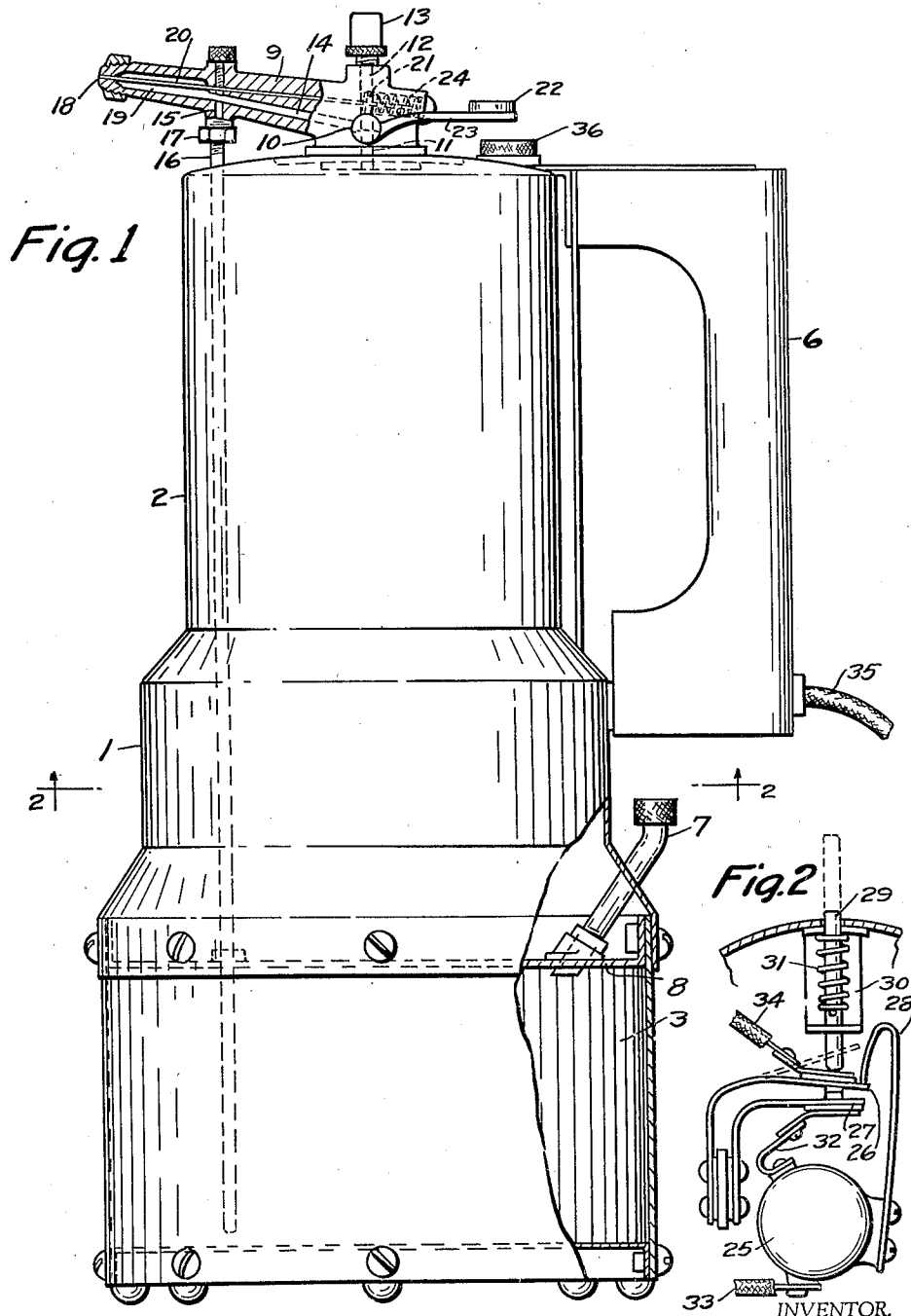
E. DAVIDSON

2,233,836

SFRAYING DEVICE

Filed Oct. 16, 1939

2 Sheets-Sheet 1



March 4, 1941.

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SPRAYING DEVICE

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Fig. 3

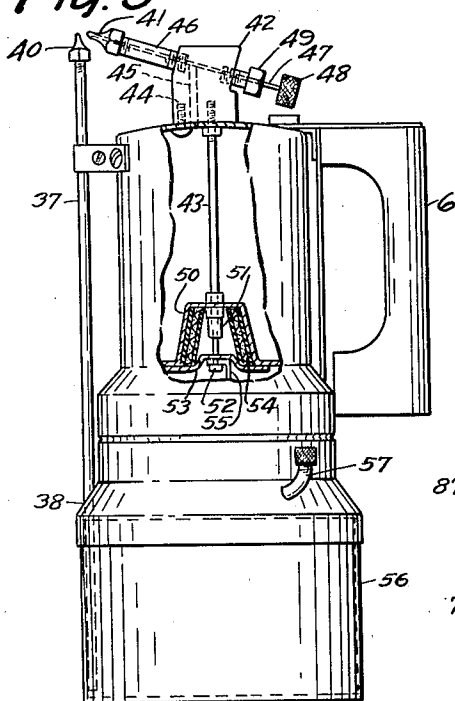


Fig. 4

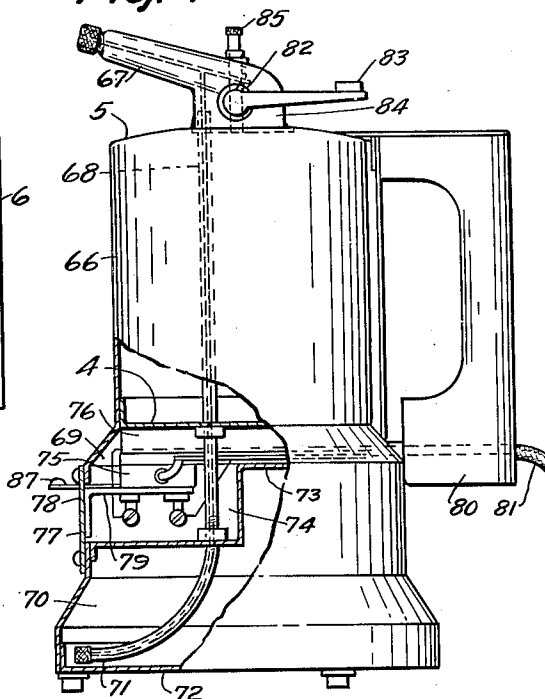


Fig. 5

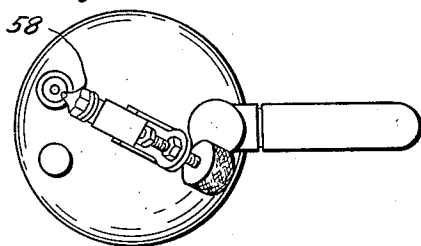


Fig. 6

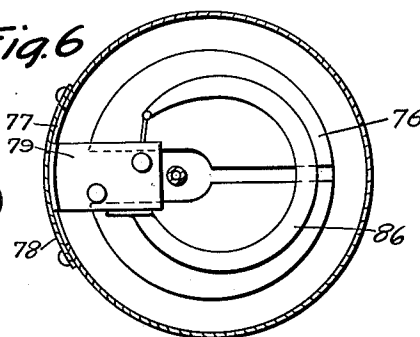
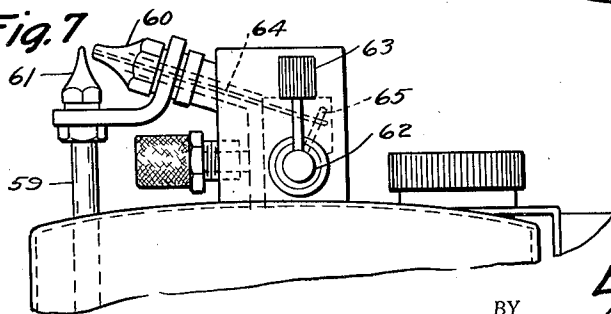


Fig. 7



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UNITED STATES PATENT OFFICE

2,233,836

SPRAYING DEVICE

Ellis Davidson, New York, N. Y.

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4 Claims. (Cl. 299—87)

The purpose of this invention is to provide improvements in spraying devices particularly for insecticides and the like by providing a permanent refillable container in the device, and using an improved nozzle and also an improved circuit breaker.

The invention is a device for spraying insecticides or the like comprising a casing, a boiler, a heating element, an automatic circuit breaker, a spraying nozzle and a container, all of which are embodied in or installed upon a unitary casing.

The invention embodies improvements in a device as described in Patent Number 1,963,838, which has been assigned to the Pestolator Corporation and D. P. A. Sales Corporation, both of which I am sole owner, and these improvements embody details of construction which I have found necessary to make in these spraying devices, such as providing a permanent container instead of a removable container, and also a different form of nozzle for spraying the fluid, and different circuit breakers and heating elements.

The object of this invention is, therefore, to provide improvements in spraying devices for insecticides by combining all of the essential parts in a unitary casing.

Another object is to provide a spraying device in which steam is used as a conveying agent, in which the steam generating chamber and fluid storage chamber are permanent elements of a unitary casing.

Another object is to provide a spraying device having means generating steam as a conveying agent, and a fluid storage chamber in which the fluid may be conveyed to spraying position without passing through the steam generating unit.

A further object is to provide means for incorporating the usual non-refillable fluid supply containers in the casing of the unit with a filling opening through which the fluid may be supplied.

And a still further object is to provide improvements in the construction of spraying devices for insecticides and the like in which the conveying agent chamber and fluid supply chamber are incorporated in a unitary casing which is of a simple and economical construction.

With these ends in view the invention embodies a boiler, a fluid supply chamber integral with the boiler but adapted to be removed for emergency, a heating element, a circuit breaker operative when the boiler is dry, a spray nozzle, and a cleaner and shut-off device in said nozzle.

Other features and advantages of the invention will appear from the following description

taken in connection with the drawings, wherein:

Figure 1 is a view showing a side elevation of the device of the improved design.

Figure 2 is a view showing a section through the casing shown in Figure 1 on line 2—2 showing the circuit breaker.

Figure 3 is a view showing a casing similar to that shown in Figure 1, showing a nozzle of an alternate design.

Figure 4 is a view showing a casing of an alternate design in which the generating chamber and fluid supply chamber are integral with the casing, and the heating element and circuit breaker removable through a side opening in the casing.

Figure 5 is a plan view showing an alternate design in which the spray nozzle discharges toward one side instead of straight ahead of the handle.

Figure 6 is a detail showing the circuit breaker and heating element as a removable unit of the design shown in Figure 4.

Figure 7 is a view showing a nozzle of an alternate design in which a rotary valve is used.

In the drawings the device is shown as it may be made, wherein numeral 1 indicates the outer casing, numeral 2, a boiler, and numeral 3, a fluid storage chamber.

The casing 1 may be made as illustrated, however, it will be understood that it may be of any type or design. In the design shown, the casing is formed with a horizontal partition, as shown in detail in Figure 4, in which the partition is indicated by the numeral 4, thereby separating the upper part of the casing and forming a boiler between the partition 4 and the top 5. The lower end of the boiler may, however, be located at any point. The casing may also be provided with a handle 6 and a compartment 3 with a filling spout 7 that may extend through the upper end 8 and outward through the wall of the casing 1, and, although this is illustrated in Figure 1 as being positioned below the handle, it will be understood that it is located toward one side or may be located at any point.

A nozzle is provided at the upper end of the casing, and in the design shown in Figure 1 this is formed in an element 9 having a valve 10 therein, with the valve communicating with a passage 11 extending into the steam generating chamber or boiler 2, and with the opposite side communicating with a passage 12 having a safety valve 13 at the end thereof. The valve 10 also provides a communicating passage to an outlet opening 14 extending outward through the neck of the element 9, and this passage ex-

tends over an opening 15 connected to the upper end of a tube 16 by a coupling 17, and the tube 16 extends downward through the boiler and into the storage chamber 3 in the lower end of the casing.

It will be noted that as steam passes outward through the passage 14, it will draw fluid through the connection 15, ejecting the fluid outward through the tip 18 of the nozzle and through a mixing chamber 19 behind the nozzle.

The nozzle is provided with closing means in the form of a small rod 20 extending through the tip of the nozzle and extending backward to an upwardly extending member 21 on the valve 10, and it will be noted that, as a button 22 on an arm 23 at the end of the valve is pressed downward to open the valve, it will draw the rod 20 backward, opening the tip or outer end of the nozzle. A spring 24 is provided in the element 9 which bears against the member 21, holding the rod 20 forward and also the button 22 upward when the button 22 is released, and it will be noted that by gripping the handle 6 by hand, the thumb may be placed upon the button 22 to readily open and close the nozzle as desired. It will also be noted that, with the button in the position shown, a direct connection is provided to the safety valve although the outlet to the passage 14 is closed. However, when the button 22 is pressed downward, the passage through the valve is turned to provide a direct passage through the opening 11 to the passage 14, and steam generated in the boiler will pass upward and outward, drawing the fluid from the chamber 3.

Below the boiler is a heating element 25 controlled by an automatic circuit breaker or switch having two contact members 26 and 27 normally held together by a thermostat or bimetal element 28, however, when all of the water of the boiler has been converted into the steam, the temperature of the element 25 increases and causes the thermostatic element 28 to move outward, releasing the contact 26 which moves upward to the position indicated by the dotted lines, and at the same time forces a pin 29 outward to the position indicated by the dotted lines. This breaks the circuit to the heating element preventing damage to the device should the water be permitted to boil out. The pin 29 is slidably held in the bracket 30 and resiliently held inward by a spring 31, and it will be noted that the terminal 27 is directly connected to the heating element 25 by a connection 32, and the opposite terminal of the heating element is connected to a source of supply by a wire 33, with the contact 26 also connected to the source of supply through a wire 34, and with both of the wires 33 and 34 passing outward through the handle through a wire or conduit 35. It will be understood that any suitable heating element may be used in the device, and the boiler 2 may also be provided with a filling plug 36 which may be of any type or design, and may be provided at any point.

In the design shown in Figure 3, the casing is substantially the same as that shown in Figure 1, except that the supply tube from the fluid storage chamber, which is indicated by the numeral 37, is positioned on the outside of the boiler or upper part of the casing, with the upper end extending downward through the casing at the point 38, and into the storage compartment at the lower end, with a nozzle tip 40 at the upper end, and this is positioned so that steam

or the like injected from a nozzle 41 will draw the fluid upward through the fluid 37, providing spraying means therefor. The steam connection is provided in a member 42 which is mounted on the upper end of the boiler and attached to a tie rod 43 which is threaded into the lower end thereof, and this is also held by a screw 44.

The member 42 is provided with a steam passage 45 extending outward through an extension 46 through which a rod 47 is placed, and the rod 47 is provided with a head 48 so that it may be moved inward or outward, with the inner end thereof extending into the nozzle 41 opening and closing the same as desired. The rod 48 extends through a packing gland 49 in the member 42.

In this design the rod 43 extends downward and is held in an insert 50 in the lower part of the boiler, and on the lower end thereof is a coupling member 51 into which a screw 52 is threaded, the screw 52 holding a cap or heat conveying member 53 over a heating element 54 extending around the wall of the part 50. It will be understood that this heating element may be of any type and may be of any shape or design. Heat from the element is conveyed by the member 53 and a connection 55 to the circuit breaking switch as illustrated in Figure 2. In this design the chamber 56 at the lower part of the casing similar to the chamber 3 is provided with a filling connection 57 as shown.

In Figure 5 the nozzle, as indicated by the numeral 58, is shown as being positioned at an angle, and this nozzle may be of the type shown in Figure 3, or as shown in any of the other designs or any suitable nozzle may be used.

The nozzle illustrated in Figure 7 is somewhat similar to that shown in Figure 1, except that the supply tube, as indicated by the numeral 59, is positioned in the boiler, and the nozzle outlet 60 is positioned so that steam will pass over the tip 61 as shown, the inner part of the nozzle head having a valve 62 therein adapted to be rotated by a button 63 at one end, and the device is provided with a rod 64 similar to the rod 20 which may be moved backward and forward by a projection 65 on the valve to open and close the nozzle.

In the design shown in Figures 4 and 6, the boiler 66 is provided with a nozzle 67, the inner end being directly positioned on the upper end of the boiler, and this is provided with a tube 68 similar to the tube 16 which extends downward through a heat compartment 69 into a storage chamber 70 at the lower end, with the end 71 of the tube 68 curving over toward one side so that substantially all fluid in the storage chamber may be used. In this design the storage chamber is formed in the lower end of the casing, and this is located between a lower plate 72 and an upper plate 73, the plate 73 having a well 74 therein in which the circuit breaking switch 75 is positioned, and the heating element 76 to which the switch 75 is directly connected is positioned directly below the boiler 66, and this is arranged in two halves so that the entire element may be withdrawn through an opening 77 in the front of the casing. The opening 77 is closed by a cover plate 78, and the cover plate is provided with a support 79 upon which the switch 75 is mounted, and the heating elements may be directly connected to this switch so that the entire unit may be withdrawn through the opening 77. In this design the casing is provided with a handle 80 and a cord 81 may extend through the

handle to the switch, and heating element for supplying current thereto. In this design the nozzle 67 is formed with a valve member 82 operated by a button 83, similar to the valve illustrated in Figure 1, with the inner parts substantially the same except that the supply tube 68 extends directly upward into the base 84 of the nozzle. This nozzle may also be provided with a safety release valve 85 as shown and described, and the switch 75 is operated by a bimetal element 86 positioned against the heating element, and set by a button 87.

It will be understood that changes may be made in the construction without departing from the spirit of the invention. One of which changes may be in the use of any other arrangement of the various parts, another may be in the use of a spraying nozzle of a different type or design, another may be in the use of a different heating element, another may be in the use of an automatic circuit breaker of any other type or design, and still another may be in the use of other means for permanently mounting the container or storage chamber in the casing.

The construction will be readily understood from the foregoing description. In use the device may be provided as shown and described, and, when it is desired to use the device, particularly for spraying insecticides, the lower compartment or storage chamber is filled with the insecticide, and the upper part or boiler is filled with water, and, when the current is provided, the water will be converted into steam, and, when the nozzle is opened, the steam will pass upward through the nozzle, drawing the insecticide and acting as a conveying valve. It will be noted that, with a nozzle of this type, the device may readily be

turned on and off while operating, and should the water be permitted to boil out of the boiler the automatic switch will instantly shut off the supply of current, preventing overheating.

Having thus fully described the invention what I claim as new, and desire to secure by Letters Patent, is:

1. A spraying device comprising a housing divided into a plurality of compartments one positioned above another, the upper of said compartments forming a boiler, the lower of said compartments providing storage for a fluid, and an intermediate compartment providing space for a heating element, circuit breaker, and closing means for the circuit breaker, means removably attached to the intermediate compartment providing access to said heating element and circuit breaker, said upper and lower compartments having filling openings therein, a nozzle positioned on the upper end of said upper compartment and communicating with the interior thereof, and a connection from the nozzle to the said lower compartment.

2. A spraying device as described in claim 1, in which the lower compartment is removable.

3. A spraying device as described in claim 1, characterized in that the circuit breaker comprises a switch, a latch mounted on the heating element of bi-metal material for holding the switch closed, and the closing means comprises a button positioned to be moved outward by the switch as it is released.

4. A spraying device as described in claim 1, characterized in that the connection from the nozzle to the lower compartment is located on the outside of the boiler.

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