June 19, 1934. L. B. DOUGHERTY ET AL 1,963,838

VERMIN DESTROYER

Filed May 23, 1933 2 Sheets-Sheet 1

Fig. 1

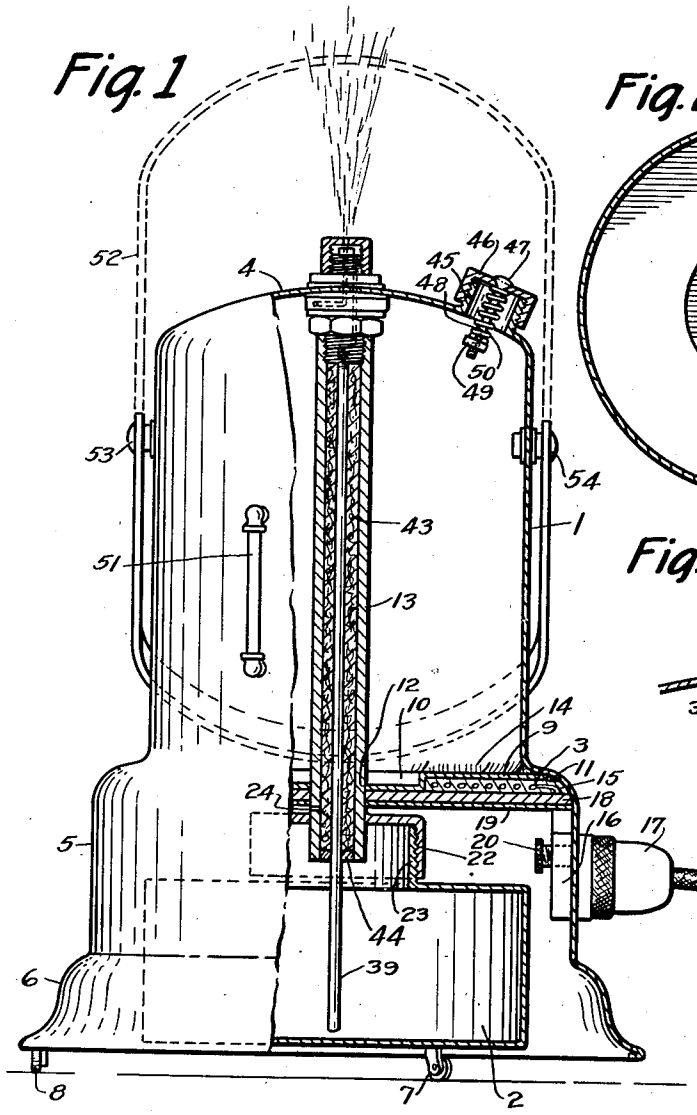


Fig. 2

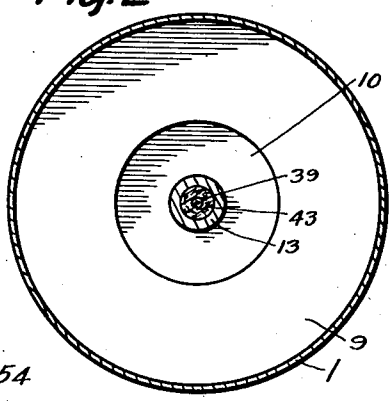


Fig. 3

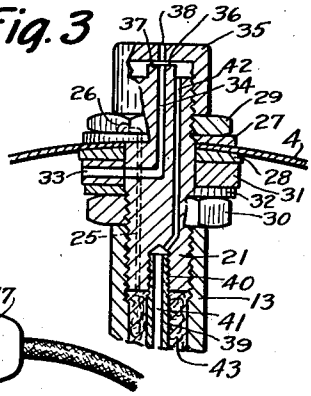


Fig. 4

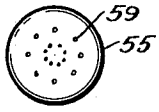


Fig. 5

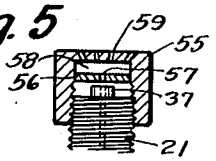
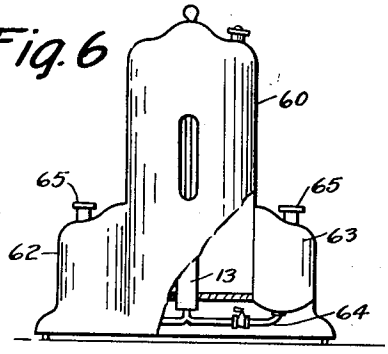


Fig. 6



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Fig. 7

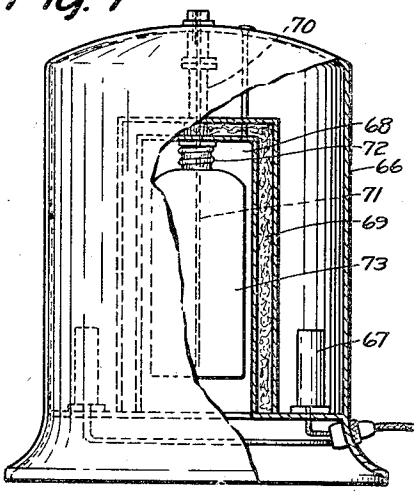


Fig. 8

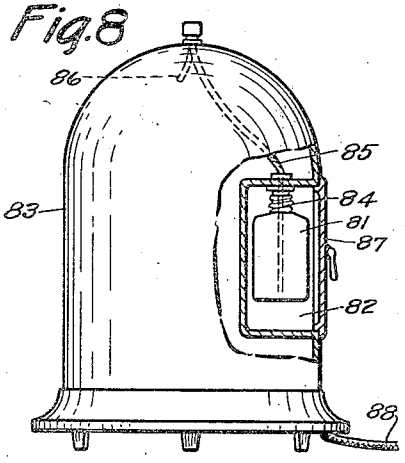


Fig. 9

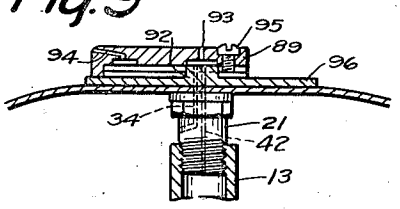


Fig. 10

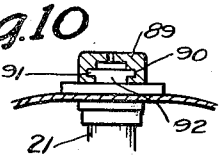


Fig. 11

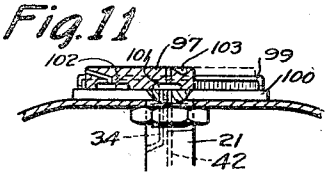
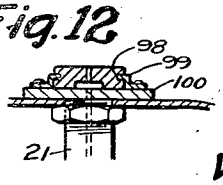


Fig. 12



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1,963,838

VERMIN DESTROYER

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New York, N. Y.

Application May 23, 1933, Serial No. 672,451

17 Claims. (Cl. 299—87)

The purpose of the invention is to provide means for absolutely killing and destroying vermin, insects, bacteria and the like, such as cockroaches, bed-bugs, moths, flies, mosquitoes, etc.

The invention relates to means for discharging a vermin destroying fluid which is substantially heavier than air into an enclosure in such a manner that it will travel to all points of the enclosure including the upper and lower parts thereof.

The invention also relates to means for deodorizing, disinfecting, and fumigating and is also used for medication and as a germicide, and insecticide.

The invention is an apparatus for ejecting a vermin destroying fluid in combination with steam or other gaseous substances into the atmosphere in an upward direction so that it is driven to the upper part of an enclosure, and in which the vermin destroying fluid may be preheated and atomized by drawing it upward thru the heating or steam or other gaseous producing means.

Vermin destroyers have been used heretofore in both the fluid and solid forms and different types of apparatus have been provided for discharging, applying or permitting the escape of the fluids, solids or vapors therefrom, however, these fluids and vapors are generally heavier than air so that whereas they may be very efficient for germs or vermin around the base of a room or enclosure they do not rise to the upper part thereof and are therefore not very efficient for killing or destroying vermin in an entire room or enclosure. These destroyers generally have a very objectionable odor and in most cases are injurious to human life. They are also provided with the intention of suffocating, or snuffing out life by strangulation or other similar means and as it is usually necessary for the vermin to absorb a portion of the substance thru the respiratory tract, they cannot be one hundred percent efficient.

The object of this invention is, therefore, to provide a vermin destroyer which attacks the vermin from any part of the body, spore or cell acting as a stomach or contact poison, and which disintegrates or breaks down the cell tissues or by which the cell is dissolved or broken down. The introduction of the toxic ingredients is facilitated by the penetrating qualities of the vehicle and is dissolved and diluted by the body fluids, so that death is absolutely assured whether or not the substance is actually inhaled or introduced into the body thru the respiratory tract or any other medium.

Another object of the invention is to provide the combination of a vermin destroyer with an agent for conveying the destroyer to the upper and substantially all parts of a room or enclosure and so that it will also penetrate all cracks and crevices thereof.

Another object is to provide a vermin destroyer which is harmless to human beings or household pets, and which will not contaminate foodstuffs.

Another object is to provide a germicide spraying device which will draw the germicide from a refillable or renewable container on the inside and at the bottom of the device.

Another object is to provide a device for spraying a germicide in combination with water vapor which is portable and may be operated at any point or points.

A further object is to provide a device for spraying a fluid for destroying insects, or the like, in combination with water vapors, which is substantially compact and may be used and moved as a unit.

And still another object is to provide a device for spraying vermin destroying gases which is of a simple and economical construction.

With these ends in view the invention embodies an insecticidal or insect repelling composition containing botanical derivatives, such as Rotenone and the like of oil soluble principles of Pyrethrum flowers and a boiler having a tubular casing in the center thereof with a comparatively small tube in the center of the casing, a renewable container at the lower end of the tubular casing, an electric heating element below the boiler, a safety valve and filling opening, and a spray 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 with part broken away showing a section approximately on the center line.

Figure 2 is a section thru the central part of the casing.

Figure 3 is a detail showing a section thru the nozzle at the upper end of the casing.

Figure 4 is a plan view of the nozzle showing an alternate design in which the nozzle is provided with a plurality of openings.

Figure 5 is a cross section thru the upper end of the nozzle showing a nozzle having a plurality of openings similar to that shown in Figure 4.

Figure 6 is a view showing an alternate design which may be provided for industrial use showing a side elevation of the device with part broken away.

Figure 7 is a view showing another alternate design in which the refillable container or cartridge is inserted in an insulated chamber inside of the boiler from the bottom thereof.

Figure 8 is a similar view showing another alternate design in which the cartridge or container is inserted from the side of the container and held in a pocket in the side thereof.

Figure 9 is a detail showing a nozzle of an alternate design in which a sliding cap is used to provide a vertical and angular discharge.

Figure 10 is an end view of the nozzle shown in Figure 9.

Figure 11 is another detail showing a sliding cap of another alternate design.

Figure 12 is a view showing a cross section of the cap shown in Figure 11.

In the drawing the device is shown as it would be made wherein numeral 1 indicates the casing, numeral 2 the renewable container in which the germicide or germ destroying solution may be placed, and numeral 3 an electric heating element.

The casing 1 is preferably made of sheet metal, spun to the shape shown, and made in one continuous piece providing a complete outer shell, however, it will be understood that this may be made of any material, of any design, and formed in any manner. In the design shown the upper section, as indicated by numeral 1, is of a cylindrical shape and this is provided with a raised top 4. Below the section 1 is an enlarged section 5, also of a cylindrical shape and below this section is an outwardly flared flange 6. The lower end is preferably open and provided with legs 7 having insulating members 8 attached thereto to prevent a direct contact between the metallic casing and the surface upon which the device may be placed.

At the lower end of the section 1 and on the inside of the casing is a horizontal partition 9 with a well 10 in the center thereof, and the outer edge of this partition is soldered or welded to the inside of the casing 1, as indicated at the point 11, and the central part is provided with an opening 12 thru which a tubular casing 13 on the interior passes, and the edges of the opening 12 may be soldered or welded to the surface of this casing. It will be understood that although these connections are referred to as being soldered or welded they may be formed or made in any manner to provide water tight joints. The outer edge of the partition 9 may be formed with, what may be termed as a weak section 14, in which part of the solder may be omitted, so that, if the pressure in the boiler should exceed a certain amount and the safety valve fail to work, the connection will blow at the point 14 and relieve the pressure, and this section may be soldered back in place, thereby causing very little damage to the device.

The electric heating element 3 is provided in the form of a ring and is placed below the partition 9 and around the outer surface of the well 10. This element may be connected thru wires 15 to a socket 16 and a plug 17 may be attached to the socket or inserted therein in any manner. It will be understood that this connection which may extend to a source of electric current may be located at any other point or points, and formed in any manner and any means may be used for supplying electric current to the element. An asbestos pad 18 is provided below the element and a thin covering plate 19 may be provided below the asbestos pad, if desired. A thermostat plug 20 may be provided in the socket 16 and this may be arranged so that it will break the circuit if the temperature of the device exceeds a predetermined degree. It will be noted that should the water in the device evaporate, a small amount of water will remain in the well 10 and at this time the outer portion of the casing will heat to a sufficient temperature to cause the element 20 to break the circuit. It will be understood, however, that any other means may be used for breaking the electric circuit or turning off the electric current as the water evaporates or is converted into steam.

The inner cylindrical casing 13 is threaded upon the lower end of a bushing 21 at the upper end of the casing and at the lower end of the casing 13 is a cap 22 into which a neck 23 of a refillable container 2 may be screwed. The container 2 is preferably round and provided with a neck to fit the cap 22, however, it will be understood that this container may be of any shape, design or size, and any means may be used for securing it to the lower end of the casing 13. A small opening 24 may be provided in the outer surface of the casing 13 between the cap 22 and the plate 19 to admit air to the interior of the casing 13 in order to provide a circulation thru the casing, if desired, and a small opening, as indicated by the dotted lines 25, may be provided in the bushing 21, which will extend from the lower end thereof, to a point 26 at the upper end connecting to the atmosphere outside of the device.

The bushing 21 at the upper end of the casing may be made, as shown in Figure 3, with the upper and lower ends threaded and with packing washers, preferably of asbestos, as indicated by the numerals 27 and 28, on each side of the top 4 of the casing 1, and a locking nut 29 may be provided on the upper threaded end of the bushing so that it may be screwed downward against the washer 27, and a lower packing nut 30 may be provided which may be screwed on the lower end of the bushing and this may lock the washer 28 thru other washers 31 and 32, as shown. The washer 31 is preferably made integral with or fixedly attached to the bushing and this is provided with an opening 33 that extends inward to the center of the bushing and connects to the lower end of an opening 34, as shown. The openings 33 and 34 connect the interior of the casing 1 to the interior of a cap 35 that may be screwed upon the upper end of the bushing and at the upper end of the bushing is a small projection 36 which substantially engages the inner surface 37 of the cap 35. In the center of the cap is a small opening 38 corresponding with the upper end of the opening 34 and it will be noted that, as steam pressure is created within the casing, the steam will be forced thru the openings 33 and 34 so that they will be injected into and thru the opening 38. This steam passing thru the small opening between the upper end of the bushing and the inner surface of the cap will create a suction in this area and direct the fluid from the container 2 upward thru a tube 39 that extends from the bottom of the container 2 upward to the lower end of the bushing 21 where it is threaded into the bushing, as shown at the point 40, and from this point the opening 41 in the center of the tube 39 is connected by a passage 42 to the upper end of the bushing so that as suction is created

in the space between the upper end of the bushing and the cap the fluid will be drawn thru the opening 42 and thereby thru the opening 41. The space between the tube 39 and the inner surface of the casing 13 may be packed with asbestos, as indicated by the numeral 43, however, it will be understood that this space may be open or formed so that a vacuum may exist therein and the lower end may be sealed as shown at the point 44. Any other means may be used for insulating the tube 39 from the temperature of the water or steam in the casing 1 so that the temperature of the fluid passing upward in the tube 39 may be controlled and regulated as may be desired.

In the upper end of the casing is a threaded neck 45 and a cap 46 may be screwed on this neck to provide means for filling the casing. A safety valve 47 may be provided in the center of the cap 46 and this valve may have a stem 48 extending thru the neck and provided with a nut 49 at the inner end so that a spring 50 placed around the stem will resiliently hold the valve in the closed position, however, as pressure is created in the casing 1, the pressure may open the valve 47. It will be understood that a safety valve of any type or design may be used and this may be arranged in any manner and it will also be understood that any other means may be provided for filling the container.

The casing 1 may also be provided with a water gage 51 and this may be made as shown or attached to or built into the casing in any manner.

The casing 1 may also be provided with a handle 52 which is pivotally attached to the sides thereof at the points 53 and 54 and this handle may be made of any shape or design and arranged in any manner or any other means may be provided on the casing by which it may be gripped or held.

In the designs shown in Figures 4 and 5 the cap 35 is replaced by a cap 55 and on the interior of this cap is a disc 56 having an opening 57 corresponding with the opening 38 in the cap 35, shown in Figure 3, and a space 58 is provided above the disc 56. It will be noted that vapors or steam will be discharged thru the opening 54 in the center of the bushing 21 and, as these pass thru the opening 57, they will draw the fluid from the tank 2 thru the opening 42, and these will mix in the chamber 58 and pass outward thru the openings 59, thereby providing a spray. It will be understood that this nozzle may be formed in any other shape or design to provide a single orifice or to provide a plurality of openings, as may be desired.

In the design shown in Figure 6, which is on a comparatively small scale, the casing 1 is replaced by a casing 60 and the container 2 by containers 62 and 63 formed at the sides of the casing 60. These containers may be connected by tubes 64 to the lower end of the tube 39 at the center, or by any other means. It will also be understood that these containers may be of any other shape or design and may be positioned at any other point or points, and the entire casing may be constructed or formed to accommodate them or to accommodate any other type of containers or tanks. The containers or tanks may be provided with filling plugs 65 and these may be of any type or design and located at any point or points.

In the design shown in Figure 7 the device is formed with an outer casing 66 which forms the boiler and this is provided with a heating element 67 which may be of any design or type and located at any point or points. In this design the device is provided with an inner central chamber 68 which is formed by an insulated wall 69 and the lower end is open thru the lower end of the casing. The nozzle is connected to the upper end of this casing by a member 70 which is similar to the casing 13 and an inner tubular member 71 is positioned in the center of this member similar to the tube 39 and the tube 71 extends downward thru the chamber 68 as shown. The lower end of the member 70 also extends into the chamber 68 and this is provided with threads on which a threaded neck 72 of a container 73 may be screwed as shown. It will also be noted that the container 73, which may contain the vermin destroying fluid may be inserted thru the lower end of the casing and chamber 68 and screwed on the lower end of the member 70 by hand. The container may also be removed and replaced thru the lower end of the casing. It will also be understood that other means may be used for holding or supporting the container in the chamber 68 and the chamber 68 may also be of any other shape or design.

In the design shown in Figure 8 the vermin fluid container 81 is inserted in a pocket 82 in the side of the casing 83 and it will be understood that this container may be used in a pocket formed in this manner or may be inserted in the side of the casing in any other manner or by any other means.

In the design shown in Figure 8 the container is screwed upon a nipple 84 and the nipple is connected by a tube 85 to the nozzle at the upper end of the casing, and the nozzle is provided with a connection 86 which opens into the upper end of the boiler. The pocket 82 is provided with a door 87 and this may readily be opened and closed to remove and replace the container 81. The casing 83 may also be heated by an electric element connected to a cord 88 or by any other means.

A nozzle of an alternate design is shown in Figures 9 to 12 and in the design shown in Figures 9 and 10 this is formed with a sliding cap 89 having grooves 90 therein which are slidably held over projections 91 on the sides of a neck 92 formed at the upper end of the casing. The neck 92 connects with the upper end of the member 21, shown in Figure 3, and is provided with openings 42 and 34 similar to those in the member 21 shown in Figure 3. The cap 89 is provided with a vertical opening 93 and an angularly positioned opening 94, either of which may be positioned above the neck 92 so that the substance may be ejected vertically or toward the side as may be desired. This cap may be arranged in any manner and slidably held upon the device by any means, and it will be noted that it is free to slide from one side to the other so that either of the openings 93 or 94 may be used. One end of the grooves 90 is closed and at the other end of the slide is a screw 95 which forms a stop to limit the movement of the slide. The head of the screw may also be used as gripping means by which the slide may be moved backward or forward. The neck 92 may be made integral with or attached to a flange 96 that may be attached to the upper end of the casing in any manner or by any means.

In the design shown in Figures 11 and 12 a sliding cap 97 is provided with vertical and angular positioned openings therein and this is provided with grooves 98 which are held between tracks

99, and these are mounted upon a plate 100 which is secured upon the upper end of the casing. The member 97 is provided with a recess 101 corresponding with the vertical opening and another recess 102 corresponding with the angular opening. These openings may, however, be formed in any other manner. The upper surface of the slide 97 is provided with a recess 103 by which it may be moved from one position to another. The member 100 is also connected to the member 21 and openings 34 and 42 are connected therethru as shown. It will be understood that this sliding member may be of any other type or description or any other type of nozzle may be used or any other means may be used for ejecting the spray in any position or in any form.

It will be understood that other changes may be made in the device without departing from the spirit of the invention. One of which changes may be in the use of any other means for providing heat to the boiler, another may be in the location of the container 2 in relation to the boiler, another may be in the use of other means for drawing the substance from the container 2 thru the boiler or to the nozzle, and still another may be in the use of a nozzle of any other type or design.

The construction will be readily understood from the foregoing description. In use the device may be provided as shown and described and it will be understood that the casing may be of any size and arranged in any manner. When it is desired to use the device the casing 1 may be partly filled with water and the container 2 screwed in the cap 22. With the nozzle open the electric plug may be connected to any source of electric current and, as the current is applied, the water will be heated and converted into vapor or steam. As pressure is created within the boiler the steam will be forced thru the openings 33 and 34 so that they will draw the substance from the container 2, as hereinbefore described. As the device is being used the handle will remain in the lower position so that the spray will pass directly upward and, as the substance is heavier than air, it will gradually pass downward and as more of the substance enters a room, it will penetrate cracks and openings at all corners of the walls or at any points in the enclosure. The mixing of the chemical in the container 2 with the water vapor and forcing it directly upward makes it possible to reach every point from the top to the bottom of the enclosure, and as the substance contains insecticidal or insect repelling compositions containing botanical derivatives, such as Rotenone and the like of oil soluble principles of Pyrethrum flowers, it will absolutely destroy all forms of vermin, bacteria, germs and even the lower forms of life, such as cells and spores, thereby completely eliminating all possibility of vermin or the like returning or being resurrected after the spraying is completed.

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

1. In apparatus for destroying vermin or the like, a boiler, means supplying heat to said boiler, a fuel container positioned at the lower end of said boiler, a vertical tube extending thru the center of said boiler with the lower end extending into said container, and a nozzle at the upper end of said tube and boiler having a steam escaping passage extending therethru and communicating with said vertical tube forming suction producing means drawing fluid from said container and ejecting same from said apparatus.

2. Apparatus for ejecting fluids having a pressure chamber, a fluid container removably attached to the lower end of said pressure chamber, an ejector in the upper end of said pressure chamber and communicating therewith, and connecting means between the ejector and the container whereby the fluid is drawn upwardly through the pressure chamber as it is ejected.

3. Apparatus for ejecting fluids having a casing with a pressure chamber, a fluid container removably mounted in the lower end of said casing beneath the pressure chamber, an ejector in the upper end of said pressure chamber and communicating therewith, and connecting means between the ejector and the container whereby the fluid is drawn upwardly through the pressure chamber as it is ejected.

4. In a vermin destroying apparatus as described in claim 1, a jacket surrounding said vertical tube, and insulating material between said tube and jacket.

5. In vermin destroying apparatus as described in claim 1, means for adjusting said nozzle to regulate the ejection of fluid therefrom.

6. In a spraying apparatus, an outer casing having therein a boiler, a removable container positioned within said casing, an ejector nozzle at the upper end of said casing and opening directly into the boiler, said nozzle having a vacuum opening positioned adjacent said steam connection, and means connecting said vacuum opening to the interior of said container and extending into the upper portion of the boiler.

7. In apparatus as described in claim 6, means insulating said container from the boiler.

8. In apparatus as described in claim 6, means insulating said container and the connection therefrom to said nozzle from the boiler casing.

9. In a vermin destroyer of the character described, a casing having a partition therein, an electric heating element below said partition, a container below the electric heating element, a tube extending from the container upward thru the casing and an ejector nozzle at the upper end communicating with the interior of the casing and constructed to eject steam created in the casing and draw a substance thru the tube in the center from the container at the lower end so that the substance will be mixed with steam as it is ejected thereby.

10. In a device as described in claim 9, a jacket surrounding said tube in the casing.

11. In a device as described in claim 9, a safety valve on said casing.

12. In a device as described in claim 9, means insulating the tube in the center of the casing from the temperature of the boiler.

13. In a vermin destroyer, a casing, a boiler formed in said casing, means for heating water in said boiler, a sleeve extending continuously thru said boiler, a tube in said sleeve, a renewable container at the lower end of said sleeve and into which said tube extends, a nozzle at the upper end of said casing to which said sleeve and tube are connected, a passage communicating with said boiler extending to the tip of said nozzle, and another passage communicating with the tube in the center of said sleeve and extending to a point adjacent the tip of said nozzle.

14. In a vermin destroying apparatus as set forth in claim 1, a heat insulating jacket surrounding said vertical tube.

15. In apparatus for destroying vermin or the

like, a boiler, means supplying heat to said boiler, a fuel container positioned at the lower end of said boiler, a vertical tube extending through said boiler with the lower end extending into said container, and a nozzle at the upper end of said tube, and boiler having a steam escaping passage communicating with the boiler and a passage communicating with said vertical tube forming suction producing means for drawing fluid from said container and ejecting the fluid from said apparatus.

16. Apparatus as described in claim 1 having a chamber at the upper end of the tube providing a confined area into which the fluid is drawn and mixed with steam before being expelled therefrom.

17. Apparatus for ejecting fluids comprising a vertical casing open at its bottom and having a pressure chamber in its upper end, a heater in the casing for the pressure chamber, an ejector on the upper end of the casing in direct communication with the pressure chamber, and a fluid container detachably mounted in the open bottom of the casing and having direct communication with said ejector to feed the fluid thereto.

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