July 28, 1942. J. A. TISCORNIA 2,291,423

SPRAYING APPARATUS

Filed March 16, 1939 2 Sheets-Sheet 1

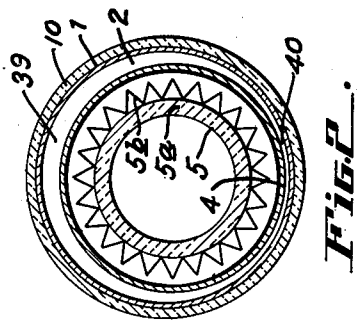


Fig. 2.

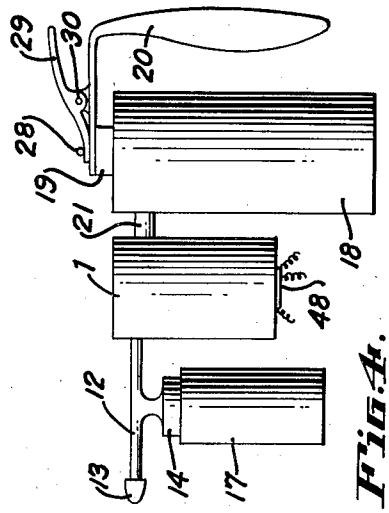


Fig. 4.

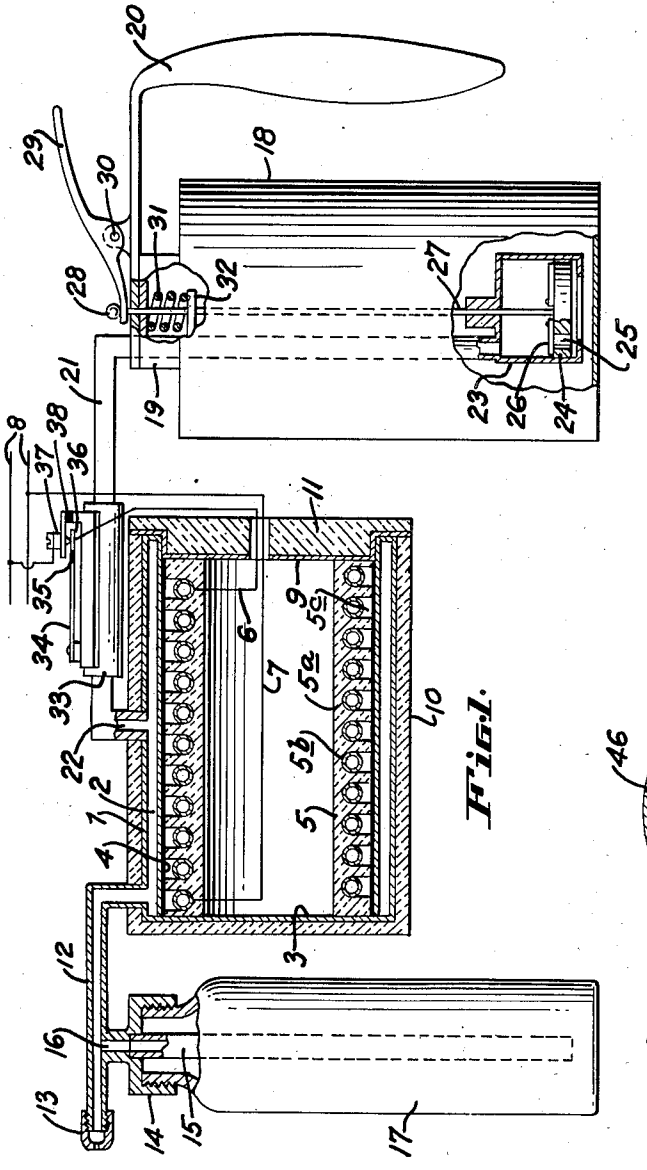


Fig. 1.

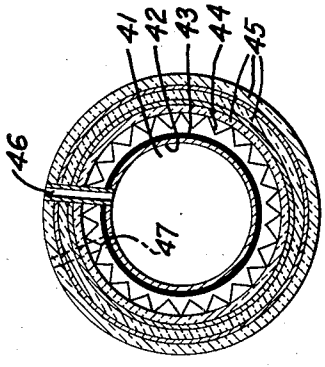


Fig. 3.

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SPRAYING APPARATUS

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Fig. 7.

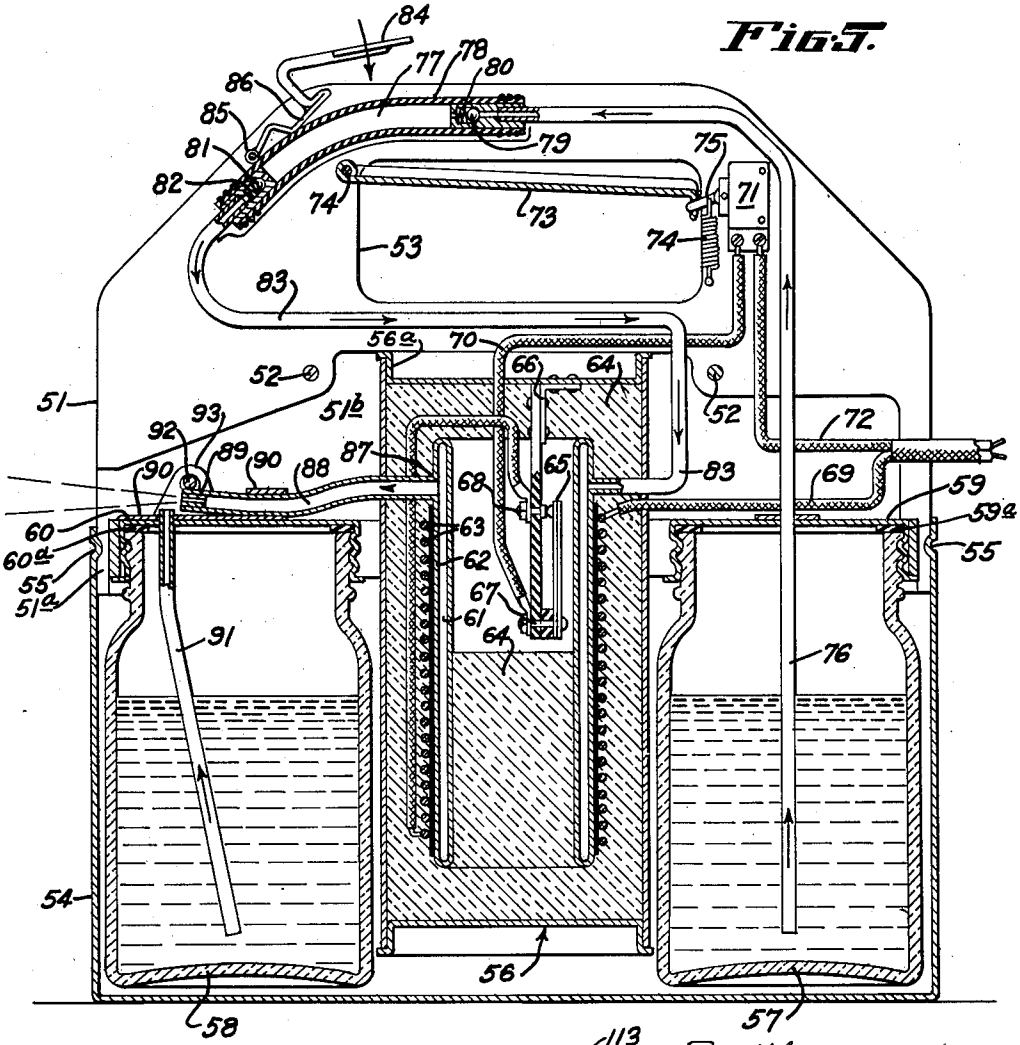
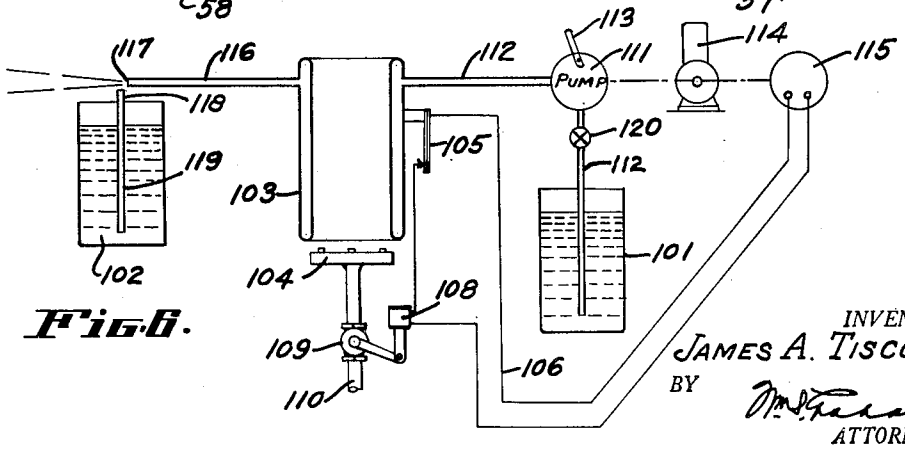


Fig. 6.



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UNITED STATES PATENT OFFICE

2,291,423

SPRAYING APPARATUS

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Application March 16, 1939, Serial No. 262,207

8 Claims. (Cl. 299—87)

The present invention relates to spraying apparatus, and more particularly to spraying apparatus of the type operating on a flash boiler system. Such apparatus finds advantageous use in the spraying of insecticides, germicides, deodorants, or any type of atomizable liquid for various purposes.

This application is a continuation in part of my pending application Serial No. 60,306, filed January 22, 1936, for Sprayers.

A flash boiler is a steam chamber in which steam may be instantly generated in required quantity and substantially instantaneously. Such a flash boiler principle is disclosed in connection with a spraying apparatus in my Patent No. 1,999,265, dated April 30, 1935.

It is one object of the invention to provide sprayer apparatus of the character indicated, wherein steam generated in a flash boiler is used as the means or vehicle which provides a force to atomize liquids discharged from an aspirator or spray nozzle.

Another object of the invention is to provide a device of the character indicated in which the steam is electrically or otherwise generated, and in which the steam chamber may be maintained at a substantially uniform temperature at all times when the device is connected to a source of electrical supply for instantly creating steam in the chamber.

Another object of the invention is to provide a device in which a liquid injector, steam generator, and steam-actuated aspirator unit are operatively combined in a small, compact and easily handled portable structure.

A further object is to provide a device including means whereby the steam forming liquid may be injected into the steam chamber in predetermined relatively small quantities as desired.

It is a still further object to provide a flash boiler system for spraying liquids and provide for safe and positive control of means to heat a flash boiler, including convenient and accessible control of the entry into a flash boiler of a liquid from which steam may be generated.

With the foregoing and other objects in view, all of which will be more apparent as this description proceeds, the invention is exemplified in the novel construction and combination of parts hereinafter described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended, it being understood that various changes in the form, proportion, size and details of construction of the apparatus may be resorted to within the scope of the appended claims without departing from the spirit or sacrificing any of the advantages of the invention.

To more clearly comprehend the invention, reference is directed to the accompanying drawings wherein:

Fig. 1 is a side elevation of a device embodying my invention, partly in section and having parts broken away.

Fig. 2 is a transverse sectional view through a portion of another embodiment of the invention.

Fig. 3 is a transverse sectional view through still another embodiment of the invention.

Fig. 4 is a side elevation of a structure showing another embodiment of the invention.

Fig. 5 is a longitudinal vertical section showing a modified form of the convenient portable apparatus of the invention.

Fig. 6 is a schematic illustration of a modified form which the invention may take for purposes of large scale operations.

Referring to the drawings of the present disclosure, 1 is a double wall cylinder defining a steam chamber 2, both ends of the chamber being closed. One end of the cylinder is likewise closed by a wall 3. Lining the inside of the cylinder 1 is a sheet of electrically insulating material such as isinglass or mica indicated 4. Removably inserted within the lines of cylinder 1 is a heater unit 5 comprising a cylinder of insulating material 5^a and heating coils 5^b in circumferential grooves 5^c, the heating coils being connected by suitable electrical conductors 6 and 7 to a source of electrical supply 8, through a thermostat hereinafter described.

At 9 is a cap closure member seated in the open end of cylinder 1 to close the same and position and retain the heater unit. The cylinder 1 and the cap member 9 are covered with heat insulating material as at 10 and 11 respectively.

At 12 is shown a tube communicating with the steam chamber 2 and fitted with a spray nozzle 13, the tube 12 having a receptacle cap 14 mounted thereon. On the cap 14 is mounted a tube 15 communicating with the tube 12 through a passage 16 and extending downwardly to a point adjacent the bottom of a receptacle 17 seated in cap 14 as shown. The parts 12 to 17 form an aspirating device actuated by steam generated in chamber 2.

A receptacle for water is shown at 18, and this receptacle is fitted with a cap 19 provided with a handle 20. Mounted in, and extending through cap 19, is a tube 21, one end of this tube communicating with the steam chamber 2 as at 22,

and the other end carrying a pump cylinder 23 disposed adjacent the bottom of the receptacle 18. In the cylinder 23 is mounted a piston 24 having passages 25 formed therein controlled by flap-valves 26. The piston 24 is operated by means of a stem 27 passing upwardly through cap 19 and fitted with a head 28. A force means selectively operable manually is provided for pumping a small supply of fluid from cylinder 23 to the boiler chamber 2, in which a lever 29 is fulcrumed on cap 19 as at 30 and engages the under side of head 28 whereby the piston 24 may be raised by manual operation of the lever 29. The piston is normally maintained in a lowered position by a spring 31 inserted between the cap 19 and a stop member 32 on stem 27.

The tube 21 is provided with an enlarged portion 33 upon which a thermostat 34 is mounted. The part 34 of the thermostat is a bar of thermostatic bimetal insulated as at 35 from the end 36 to which conductor 6 is connected, and which contacts terminal 37 insulated at 38 and from which conductor 8 continues to source 8.

When the device is to be used the receptacle 17 is filled with the material to be sprayed, the receptacle 18 is filled with water, and the electrical connections are connected into a source of electrical supply. When so connected the heater unit becomes active, thereby heating the chamber 2. There being a continuous metallic connection from the chamber 2 through its metallic walls 1 and tube 21 back to thermostat 34, it follows that when a given temperature is reached the thermostat will be operated to break the circuit, and upon a lowering of the temperature the circuit will again be closed, thereby maintaining a substantially uniform temperature in the chamber 2.

It will be noted that the volume of the pump cylinder 23 is relatively small compared with the volume of the fluid receptacle 18, and that the upper surface area of piston 24 is large as compared with the interior passage of tube 21, so that upon the forward or upward stroke of the piston a selective amount of fluid in the pump cylinder is supplied to the flash boiler chamber 2 in relatively small quantity at any one instant, as compared to the total volume capacity of either the receptacle 18 or cylinder 23 or the inner area of chamber 2. Since upon manual operation of finger lever 29 a force is exerted upon the fluid in cylinder 23, the amount of water injected may be controlled and also may be made to enter the steam chamber 2 in a fine stream of small diameter in a spurt or jet. Manifestly, upon the return or downward stroke of piston 24 responsive to spring 31, the pump cylinder 23 will be replenished with an amount of fluid equal to the amount previously displaced, and the spring 31 returns the lever 29 to its non-pumping position. Upon operating the lever 29 the small quantity of water injected into steam chamber 2 is instantly converted to steam, in the manner of a flash boiler, due to the thinness of the cavity thereof as compared with its surface area which is adjacent the heating coils 5b, providing a heating area of large surface and cross-section as compared with the selective volume of water which may be introduced into the steam chamber 2 through the feed inlet 22 of relatively small lateral cross-section. As the steam pressure builds up it discharges through tube 12 of small lateral cross-section to actuate the aspirator, drawing material from receptacle 17 and discharging the mixture in a fine spray from nozzle 13.

Since the interior passageway of tube 21 is relatively small as shown at 22 and becomes heated through its connection with cylinder 1, expansion of the steam from the water passing through its heated end would normally prevent free flow of the water therethrough, but by providing an expansion chamber at 33 this difficulty is entirely eliminated, since the back pressure or surge of the expansion is reflected back to the large volume of chamber 33.

In the embodiment of the invention shown in Fig. 2, the several parts are identical with those described, only the form of the flash boiler chamber 2 being changed. In this case the double walls of the chamber 2 are so positioned that the chamber is wider on one side as at 39 than on the opposite side as at 40. In other words, the inner wall of the chamber is eccentrically placed relative to the outer wall. By means of this arrangement any tendency of globules of water to form on the hot surface of the inner wall and travel around the same is obviated since the globules will be effectually dispersed when they attempt to pass through the restricted portion of the chamber. Likewise, when the restricted portion of the chamber is at the bottom no opportunity is provided for water to collect, because the restricted passage forces intimate contact between the water and the heated inner wall.

The embodiment shown in Fig. 3 is similar to the one described except that the steam chamber is centrally located as at 41 in cylinder 42. The cylinder 42 is encased in a mica sheet 43 and this is enclosed by the heating unit 44 insulated by layers of insulating material as at 45, the inlet to the chamber 41 being shown at 46 and the outlet in dotted lines at 47.

The embodiment shown in Fig. 4 is also similar to the embodiment shown in Fig. 1 except that the heater unit-steam chamber member is disposed vertically instead of horizontally and has the thermostat mounted on one end thereof as at 48.

In the modification of Fig. 5 there is disclosed a compact arrangement of parts incorporating the several features of the invention in a conveniently portable apparatus in which an electrical switch and water pump are accessibly located, and a safety feature is incorporated in the switch. In this modification, there is provided a supporting member 51 of any suitable material, preferably of plastic electrically non-conducting type. The support member 51 may, in a sense, be termed a top casing and hand-grip, and is best made in two parts which fit snugly together in face-to-face contact and are fixedly positioned relatively by screws or bolts 52, each part having grooves and channels formed therein to receive the conducting wires and conduits hereafter described. The support member 51 has an opening 53 therethrough which forms a handle or hand-grip portion. Depending from the support 51 is a casing 54 which may be removably attached to the lower skirt portion 51a of the support 51 by resilient snap buttons 55. The support member 51 is hollowed out at its bottom portion as at 51b to provide spacing to receive the upper ends of containers, one of such containers being the steam chamber or flash boiler generally indicated 56 which is mounted as at 56a to the supporting member 51, and is disposed operatively between a reservoir 57 for a supply of water or other suitable liquid for making steam and a flask 58

for liquid insecticide, soap, powder, or other material to be sprayed. The skirt portion of the support 51 has suitably mounted therein at each of its ends threaded cap members 59 and 60, each of which is provided with a packing gland, respectively 59a and 60a. To the cap 59 is threadedly and removably mounted the water reservoir 57 and to the cap 60 there is similarly mounted the flask 58. The center container 56 houses the flash boiler or steam chamber 61 which comprises an elongated cylinder having an inner and outer wall relatively spaced and being closed at each end. Circumferentially of the outer wall of the steam chamber is a casing 62 of suitable non-inflammable electrical insulating material, such as mica, and circumferentially of the insulating casing 62 are electrically conducting resistance heater elements 63 which are helically wound around the steam chamber 61 and are connected in an electrical circuit hereinafter described. Surrounding the steam chamber 61 on all of its sides is insulating packing material 64 which serves the double purpose of thoroughly insulating the heater element 63 externally and also retaining the heat of steam chamber 61, for which latter purpose said insulation extends up into the hollow center of the steam cylinder but leaving a sufficient space for a thermostat switch 65 which is mounted in said cylinder by means of a bracket 66 of electrical insulating material. It will be noted that in each of the Figs. 1, 5 and 6 a thermostat is positioned so as to be separated from the direct heat of the heating means and so as to be operative more directly responsive to the temperature of the steam chamber than to the temperature of the heating means. This is an important factor since it is the temperature of the boiler and not the temperature of the heating means which produces the flash of steam. For instance, if the thermostat is mounted so as to be directly affected by the temperature of the heating element or coil rather than by the temperature of the boiler, it results in the latent or retained heat of the heating element preventing the thermostat from snapping to make a contact until the temperature of the heating element is reduced sufficiently, whereas, it is the temperature of the steam chamber of the boiler and not of the heating element which is critical in producing the flash steam for operating the apparatus. For that reason, the thermostat control is arranged where it snaps to complete the electrical circuit and apply additional heat whenever the temperature of the steam chamber is reduced to the point at which a flash of steam would not be effected by a jet of additional water pumped into the boiler. The thermostat 65 comprises a well-known electrical conducting bimetal bar reactive to oscillation at its free end due to change of temperatures. At one end the thermostat bar 65 is fixedly mounted on the bracket 66 by an electrical contact post 67 and having its opposite free or oscillating end normally in contact with an electrical contact post 68 which is also mounted in bracket 66 and thereby insulated. An electrical conduit extends from the contact post 68 and connects with the heating element 63, and through said element to one line 69 of an electrical current source. The other thermostat post 67 connects with an electrical conduit 70 leading to a switch 71 and being connected through said switch to the other line 72 in an electrical circuit. The switch 71 is operated by a lever 73 hingedly connected as at 74 to the hand grip portion of the supporting member 51. The switch is normally maintained open by a spring member 74 attached to a switch lever 75. When the apparatus is lifted by gripping the handle portion of member 51, including the lever 73, the latter moves pivotally upwardly toward the under side of the hand grip, and the spring 74 is tensioned and the switch 71 is closed through the lever 75, and since the thermostat 65 is normally in contact with the post 68, an electrical circuit is completed through the heater coil 63. If, however, the steam chamber becomes overheated, the thermostat will react to break the contact between itself and the post 68 and thus break the circuit until the temperature of steam chamber 61 is lowered sufficiently to permit the thermostat to again assume its normal position in contact with the post 68, whereupon the circuit is again closed. The reaction of the thermostat 65 is independent of the switch 71 and even though the switch 71 should remain closed the thermostat would serve to break the circuit when too high a temperature had been reached in the apparatus. This safety feature, generally known as a "dead man" switch, finds many advantages where the apparatus is employed in structures where it must meet fire insurance regulations, since even if the switch 71 should inadvertently fail to operate and break the circuit the thermostat would automatically do so.

The dead man switch also has an additional operative safety factor in that it comprises an associated assembly wherein the handle lever 73 automatically snaps the switch 71 into contacting relation when the device is lifted for operation by the operator and breaks the contact of the switch 71 by retraction of spring 74 when the hand grip of the device is released by the operator which ordinarily is when the operator sets the device down and discontinues the spraying operation. Thus, regardless of whether or not there be a thermostat, an operator cannot go away from the device and inadvertently leave the switch in contacting relation. Fire hazard from such inadvertence is thus eliminated, in addition to eliminating the inconvenience of any necessity of manually turning on and turning off an operating switch.

The water reservoir 57 has a tube 76 extending through its cap 59 and to adjacent the bottom of the reservoir. The tube 76 is adapted to receive a flow of water therethrough. The tube 76 connects with a pump assembly 77, and as herein exemplified, is formed of a suitable resilient rubber tubing 78 which is connected at one end to an inlet check valve 79 actuated to closed position by spring member 80 which permits water to flow by suction into the pump but not to flow in the opposite direction. At the other end of the rubber tube pump 77 is an outlet check valve 81 which is similarly spring-operated as at 82 to permit water to flow by pressure from the pump 77 but not reversely thereinto. Connected to the outlet check valve 81 is a conduit 83 leading to and opening into the steam chamber 61. The rubber tube pump 77 is operated on the well-known suction and pressure principle by a force means consisting of lever 84 which may be pressed by the thumb of the operator when simultaneously grasping the handle portion 53 of the support 51, and the switch lever 73. The lever 84 is pivotally mounted at 85 so that pressure on the lever 84 actuates a flat portion 86 of the lever for the purpose of deforming or depressing the resilient tube 78 of the pump, which

action forces a relatively small spurt of water through the outlet valve 81 and tube 83 and injects it into the steam chamber or flash boiler 61. Upon release of the lever 84 the pump 77 renews its supply of water from the water-reservoir 57 through the conduit 76 and intake valve 79, responsive to the suction of resilient pump 77. As in Fig. 1, likewise in Fig. 5, the pump cavity contains a relatively small amount of the fluid to be vaporized as compared with the fluid capacity of the source of fluid supply (receptacle 57), and the feed tube 83, and the outlet tube 88 are both relatively small in lateral cross-section as compared with the surface and cross-sectional areas of chamber 2; thus providing for feeding a relatively small sclective amount of the vaporizable fluid at any one instant, and preferably injecting it as a spurt or jet responsive to force exerted on the rubber tube pump by lever 84, the chamber 2 providing an expansion chamber for the liquid thus vaporized. Obviously, when finger pressure is released from lever 84 the resiliency of rubber tube pump 77 acts as a resilient means similar to a spring to refill the pump for displaced water and returns the lever 84 to its normal non-pumping position for repeat of manual operation. Also connected to the flash boiler at the opening 87 is a tubular member 88 which has a spray nozzle 89 at its free end. Tubular member 88 and the spray nozzle are mounted by a suitable bracket 90, adjacent to the threaded cap 60 of the flask 58. The flask 58 is provided with a tube 91 therein extending from a point adjacent its bottom through the cap thereof and having the opening at its outer end adjacent the spray nozzle of the tube 88, the latter being slightly resilient so that it may be adjusted with relation to the outlet of tube 91 by a rotatable eccentric 92 mounted in a lug 93 which is supported on the bracket 90. The steam chamber of flash boiler 61 being elongated and having its side walls spaced relatively close together provides a relatively long thin area for the reception of water through the tube 83. Since a large area of the flash boiler is exposed to the heating elements 63 as compared with the volumetric capacity of the steam chamber, the water received into the steam chamber is converted into the steam instantaneously, especially when the steam chamber is thoroughly heated as is the fact under practical operating conditions.

It is manifest that when the steam chamber or flash boiler 61 is properly heated to the predetermined temperature which is controlled by thermostat 65, the operator, having opened the switch 71 by means of the lever 73 gripped in his hand, may press with his thumb upon the lever 84 which, operating on the pump 77, injects a stream of water into the steam chamber 61 of the flash boiler wherein it is instantly turned to steam and the expansion thereof provides a pressure through the tube 88 and the nozzle 89, thereby providing an aspirator to draw liquid from the flask 58, through the tube 91 and atomize it in a disperse system as a combined spray or mist of small globules of steam and the material from the flask 58. The resilient pump 77 may be made of any desirable size and capacity so that pressure may be exerted thereon for a considerable period continuously before all the water therein is injected into the flash boiler. In that manner of operation the continuity of spray may be maintained over a very considerable period of time. Or, on the other hand, if the spray is only desired for an instant or a very brief interval, the operator can likewise depress the lever 84 for whatever time the spray is desired.

In Fig. 6 the diagrammatic view illustrates the application of the invention to large spraying operations such as in orchards for spraying of trees or large areas of crops, and in which 101 is the reservoir for water, 102 is the flask for an insecticide or other material to be sprayed, and 103 is the flash boiler and steam chamber. Each of the foregoing elements may be of the same general construction as the similar elements in Fig. 5. However, since electrical current may be inaccessible for such roving operations over large out-door areas, a heater or burner element 104 is placed under the flash boiler for generation of steam therein. The heater 104 may be operated by oil as a fuel in the same manner as any standard and well known oil burner. A thermostat 105 mounted on the wall of the boiler operates through an electrical conduit 106, to operate a solenoid 108 which actuates a valve 109 to control the flow of oil in conduit tube 110, and thus regulate the flow of oil to burner 104, thereby regulating the heat applied to the flash boiler 103. The solenoid 108 is so arranged that it will not completely cut off the flow of oil through the conduit 110, as it is not desired that the thermostat shall automatically completely extinguish the flame of burner 104, but the valve 109 may be manually manipulated to completely cut off the flow of oil to extinguish the flame of the burner. A pump 111 is provided to mechanically pump a supply of water from reservoir 101 to the steam chamber of flash boiler 103 through conduit 112 and this pump has a throttle 113 by which the pumping of water may be controlled by the operator. The pump may be driven by an internal combustion engine 114 which also operates a generator 115, the latter supplying electrical current to the solenoid 108 which operates to regulate the valve 109.

Assuming the burner 104 to be burning and the flash boiler to be heated, the operator manually controls the pump in operation by throttle 113 during any desired period of spraying operation. The pump has the usual inlet and outlet valves common to pumps, and when operated pumps water through conduit 112, to the steam chamber of flash boiler 103 where it is instantly vaporized to steam which is exhausted through conduit 116 to spray nozzle 117 providing an aspirator in combination with the open end 118 of tube 119 which extends to a point adjacent the bottom of flask 102, thereby spraying the material in flask 102 by force of the exhausting stream and providing a spray of intimately commingled globules of the steam and the liquid in flask 102. A manually operable control valve 120 may be employed in the conduit 112 between reservoir 101 and the pump 111 for an additional manual control of the water supply.

While an aspirating device has been shown and described in this disclosure, it is to be understood that the invention may be employed for spraying steam or a combination of steam and prepared spraying mixture directly from the respective sources of liquid supply, 18 in Fig. 1, 57 in Fig. 2, or 101 in Fig. 3. This may be accomplished by merely eliminating a fluid material to be sprayed from the respective flasks 17, 58 or 102.

The reference to the flash boiler as a cylindrical structure is intended to be generic to other forms in which a relative thin or narrow steam

chamber is provided, having a hollow or tubular central space or spaces.

I claim:

1. In a flash vaporizing apparatus having a handgrip supporting handle member and having means for feeding a vaporizable fluid and a discharge outlet for vaporized fluid, a flash boiler vaporizing chamber having communication with the feed means and the discharge outlet and comprising a hollow shell providing an expansion chamber for the vaporizable fluid, means for heating the flash boiler chamber, and a pump having a force means operable intermittently on the feed means for intermittently feeding a selective quantity of vaporizable fluid to the chamber of the flash boiler, said flash boiler having thermostatic control means operable responsive to the temperature of the boiler member and removed from the heat of the heating means whereby the thermostat is operable responsive to the temperature in the flash boiler for controlling the heating means, and said pump including a finger operable member accessible to the handle member for manual manipulation by the same hand of an operator which supports the flash vaporizing apparatus by said handle.

2. In a flash vaporizing apparatus having a handgrip supporting handle member and having means for feeding vaporizable fluid and a discharge outlet for vaporized fluid, a flash boiler vaporizing chamber having communication with the feed means and the discharge outlet, and providing an expansion chamber for the vaporizable fluid of large cross-section area as compared with the lateral transverse cross-sectional area of the respective feed means and outlet, means for heating the flash boiler chamber, and a pump having a one-way flow valve and a force means operable intermittently on the feed means for intermittently feeding a selective quantity of vaporizable fluid to the chamber of the flash boiler, and said flash boiler having thermostatic control means operative responsive to the temperature of the boiler and removed from the heat of the heating means whereby the thermostat is operable responsive to the temperature in the flash boiler for controlling the heating means, the said pump including a finger operable member accessible to the handle member for manual manipulation by the same hand of an operator which supports the flash vaporizing apparatus by said handle.

3. In a flash vaporizing apparatus having a handgrip supporting handle member and means for feeding a vaporizable fluid and a discharge outlet for vaporized fluid, a flash boiler vaporizing chamber having communication with the feed means and the discharge outlet and providing an expansion chamber for the vaporizable fluid of large cross-section area as compared with the lateral transverse cross-sectional area of the respective feed means and outlet, means for heating the flash boiler chamber, and a pump having a force means operable intermittently on the feed means for intermittently feeding a selective quantity of vaporizable fluid to the chamber of the flash boiler, said flash boiler having thermostatic control means operative responsive to the temperature of the boiler member and removed from the heat of the heating means whereby the thermostat is operable responsive to the temperature in the flash boiler for controlling the heating means, and said pump including means for returning the force means to a non-pumping position, the said pump including a finger operable member accessible to the handle member for manual manipulation by the same hand of an operator which supports the flash vaporizing apparatus by said handle.

4. In a portable flash vaporizing apparatus having a handgrip supporting handle, a flash boiler chamber providing an expansion chamber for a vaporizable fluid fed thereinto, said chamber having a discharge outlet for vaporized fluid, an electric resistance coil for heating the flash boiler chamber, thermostatic control means operative responsive to the temperature of the boiler member and removed from the heat of the heating means whereby the thermostat is adapted for controlling the heating means responsive to temperature in the boiler, and a pump having a manually operable finger-press member adjacent said handle and having a force means operable intermittently on the feed means for intermittently feeding a slective quantity of vaporizing fluid to the chamber of the flash boiler, and said pump including means for returning the force means to a non-pumping position.

5. In a manually portable flash vaporizing apparatus, a flash boiler member having a vaporizing chamber provided with a discharge outlet for vaporized fluid, feed means for intermittently injecting a vaporizable fluid into the boiler chamber, electric resistance coil means for heating the flash boiler chamber, thermostatic control means in the electric circuit of said coil, said thermostatic control means being operable for making and breaking the electric circuit of said coil responsive to the temperature of the boiler chamber member and a handle member for manually supporting the apparatus, the said feed means including a pump provided with a finger-press member adjacent to the said handle and having means to return the pump to a non-pumping position.

6. In a manually portable flash vaporizing apparatus, a flash boiler member having a vaporizing chamber provided with a discharge outlet for vaporized fluid, feed means for intermittently injecting a vaporizable fluid into the boiler chamber, an electrical resistance coil closely adjacent exteriorly of a wall of the chamber, thermostatic control means in the circuit of said coil and operative responsive to the temperature of the boiler member for making and breaking the electric circuit through the coil, a handle member for manually suporting the apparatus, a lever substantially parallel with and adjacent to said handle for gripping thereof in unison with the handle, an electric switch operable by said lever, for making and breaking the electric circuit of the heating coil, the said means for feeding the vaporizable fluid including a pump having a force means operable intermittently on the feed means for intermittently feeding a selective quantity of vaporizable fluid to the chamber of the flash boiler, and said force means comprising a manually operable member accessibly adjacent to the handle member for manual manipulation by the same hand of an operator which supports the flash vaporizing apparatus by the handle member.

7. A portable flash vaporizing spraying apparatus comprising, in a portable unit, a support member having mounted thereon and portable therewith an atomizing spray discharge nozzle, a flash boiler vaporizing chamber having a discharge outlet for vaporized fluid communicating with the discharge nozzle, an electrical resistance

means in an electric circuit for heating the flash boiler chamber, a feed means for vaporizable fluid communicating with the boiler chamber and including a pump operable intermittently for feeding a selective quantity of vaporizable fluid intermittently to the chamber of the flash boiler, a means whereby said pump may be intermittently operated, and a thermostatically operated make and break means in the electric circuit of said heating means, said make and break means being thermostatically operated responsive to the temperature of the flash boiler member for making and breaking the electrical circuit through the heating means whereby the heating means is controlled responsive to the temperature in the flash boiler chamber.

8. A portable flash vaporizing spraying apparatus having a spray discharge nozzle, and having, in a portable unit, a portable support member having mounted thereon and portable therewith a flash boiler vaporizing chamber provided with a discharge outlet for vaporized fluid communicating with the discharge nozzle, an electrical resistance means in an electrical circuit for heating the flash boiler chamber, a feed means for vaporizable fluid communicating with the boiler chamber adapted for feeding a selective quantity of vaporizable fluid intermittently to the chamber of the flash boiler, and a thermostatically operated make and break means in the electric circuit of the said heating means, said make and break means being thermostatically operative responsive to the temperature of the flashboiler member for making and breaking the electrical circuit through the heating means whereby the heating means is controlled responsive to the temperature of the flash boiler chamber.

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