No. 757,200.

PATENTED APR. 12, 1904.

S. KETTLE.

ATOMIZER.

APPLICATION FILED AUG. 27, 1903.

NO MODEL.

Fig. 2.

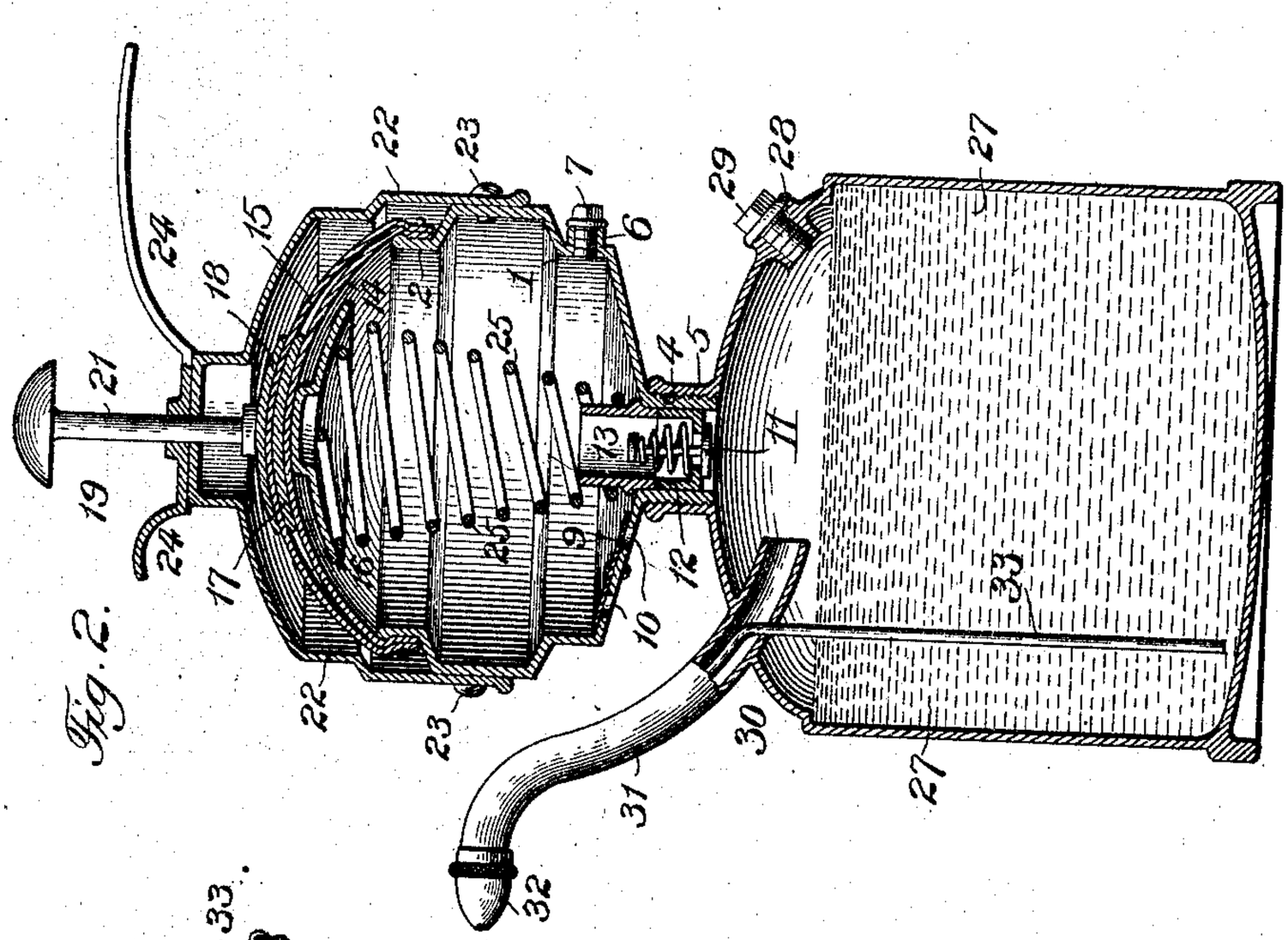


Fig. 3.

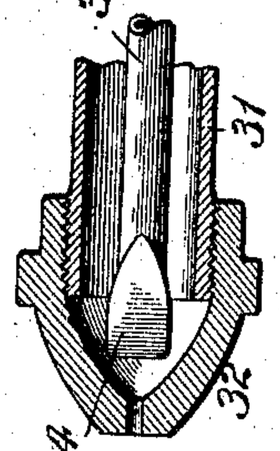


Fig. 4.

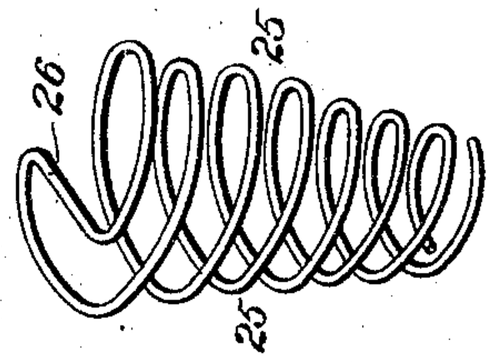
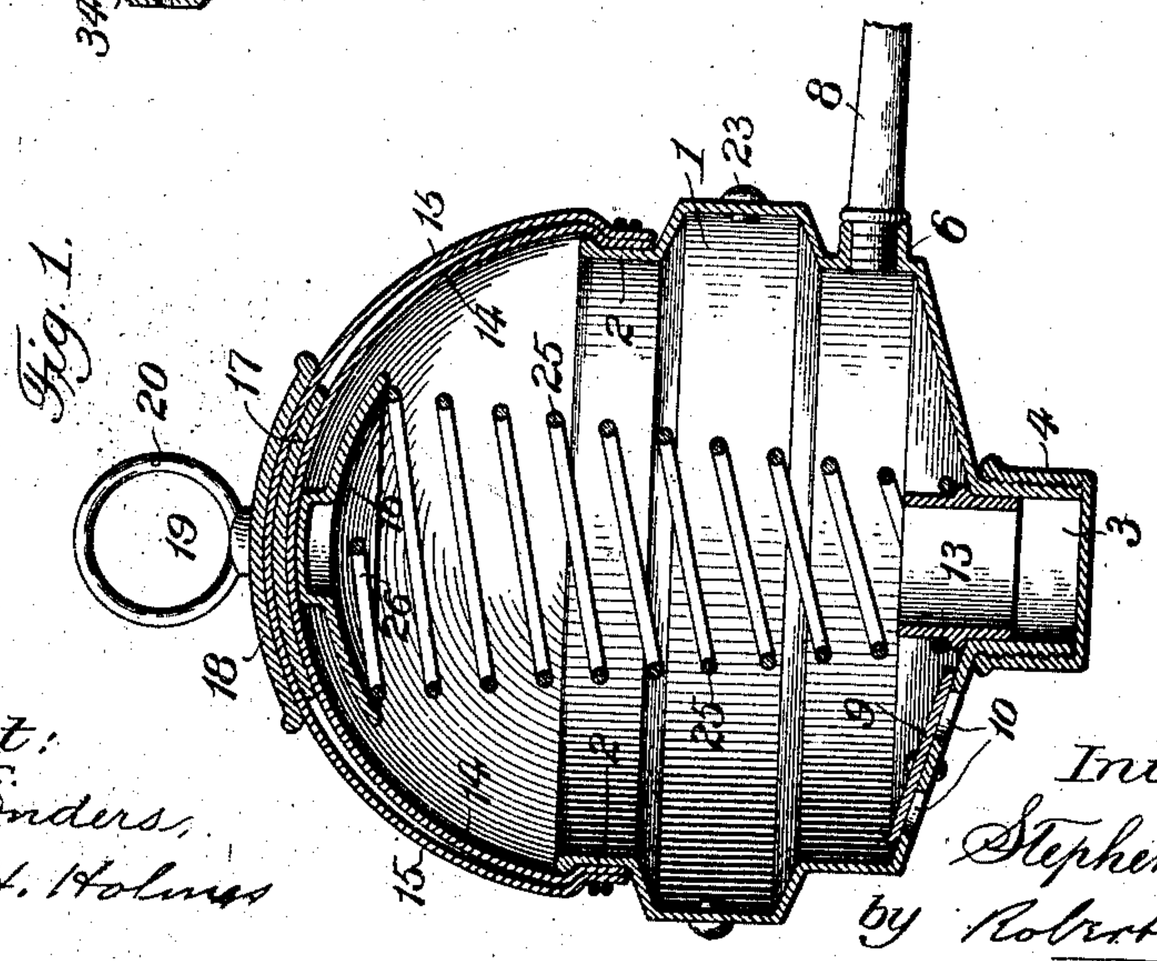


Fig. 1.



Attest:
John Enders,
W. H. Holmes

Inventor:
Stephen Kettle,
by Robert Burns
Attorney.

No. 757,200. Patented April 12, 1904.

UNITED STATES PATENT OFFICE.

STEPHEN KETTLE, OF CHICAGO, ILLINOIS, ASSIGNOR OF TWO-THIRDS TO STEPHEN E. KETTLE, OF CHICAGO, ILLINOIS, AND HERBERT W. SCOTT, OF NORTH CHICAGO, ILLINOIS.

ATOMIZER.

SPECIFICATION forming part of Letters Patent No. 757,200, dated April 12, 1904.

Application filed August 27, 1903. Serial No. 170,925. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN KETTLE, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Spraying or Atomizing Apparatus, of which the following is a specification.

The present invention relates to that class of hand appliances in which a blast of air is employed for spraying, atomizing, and puffing liquid or pulverulent materials for personal application, fumigation, and other similar purposes, and has for its object to provide a simple, durable, and efficient structural arrangement and combination of parts whereby the atomizing, spraying, or puffing operations are effected in a uniform and efficient manner, all as will hereinafter more fully appear, and be particularly pointed out in the claims.

In the accompanying drawings, illustrative of the present invention, Figure 1 is a vertical sectional elevation of the present appliance, illustrating the arrangement of the same in the simpler form of a puffing apparatus for pulverulent material, such as insect-powder. Fig. 2 is a similar view of a more complex form of the present apparatus adapted for atomizing or spraying liquid material, such as disinfectants, &c. Fig. 3 is an enlarged detail section of the jet-nozzle of the apparatus illustrated in Fig. 2. Fig. 4 is a detached perspective view of the spring by which a return movement is imparted to the flexible diaphragm of the air blower or mover.

Similar numerals of reference indicate like parts in the several views.

Referring to the drawings, 1 represents a casing having closed side and bottom and an open-topped rim 2 for the attachment of the bellows-diaphragms hereinafter described.

3 is a central tubular neck on the bottom of the casing 1, adapted for the attachment of a closing-cap 4 or of the attaching-neck 5 of a fluid-receptacle in the varied uses of the apparatus, as hereinafter more particularly described.

6 is a lateral tubular neck at one side of the casing 1, adapted for the attachment of a closing-plug 7 or of an outlet-nozzle 8 in the like varied uses of the apparatus, as hereinafter more fully set forth.

9 is a check-valve of any usual form controlling an air-inlet opening 10, preferably arranged in the bottom wall of the casing 1, as shown.

11 is a check-valve arranged in a removable seat 12, which is adapted for insertion in the aforesaid tubular neck 3 of the casing 1 when the same is used in connection with a separate fluid-containing vessel for atomizing and spraying purposes. Such valve opens downwardly from its seat and is adapted to prevent any reflux of air through the neck 3 in the operation of the apparatus.

13 is a collar fitting the upper end of the neck 3 and projecting up into the interior of the casing 1.

14 and 15 are inner and outer flexible diaphragms, of leather or other equivalent material and preferably of the dome shape shown in the drawings and having their margins secured to the open rim 2 of the casing 1, as shown in Figs. 1 and 2.

16 is a spring cap-plate having bearing beneath the inner diaphragm 14 and forming an abutment for the upper end of the coiled spring hereinafter described.

17 is an intermediate bearing-plate arranged on a median line of the apparatus and between the inner and outer diaphragms 14 and 15.

18 is an outer bearing-plate secured to the upper surface of the outer diaphragm 15 and which in ordinary cases is secured to such diaphragm by a fastening means which extends from the plate 18 to the intermediate plate 17. In some cases, however, a cementing of the plates 18 and 17 to the outer diaphragm 15 may be depended upon as a connecting means between the parts. The outer bearing-plate 18 is extended mainly for the attachment of the actuating means 19, by which the diaphragms are repeatedly depressed in the actual use of the apparatus, and such actuating means may be of any usual and suitable form and either a thumb-ring 20, secured directly to the plate

18, as illustrated in Fig. 1, or a headed push-rod 21, as shown in Fig. 2, and where certain uses may so indicate a lever mechanism may be employed to actuate the said push-rod.

22 is an inclosing housing for the diaphragms, having a depending skirt which fits the periphery of the main casing 1, as shown in Fig. 2, and is secured thereto by screws 23.

24 represents holding handles or grips on the upper part of the housing 22 for convenience in holding the apparatus during the manipulation of the same.

25 is a spiral spring which has the form of an inverted cone, with its upper end bearing against the under side of the cap-plate 16, aforesaid, while its lower end surrounds the collar 13 and bears upon the bottom of the casing 1, as shown. In a preferred form of said spring the same is composed of two inner coils formed from a single piece of wire and united together at top by a transverse integral member 26, as shown in Fig. 4.

27 is the separate fluid-containing vessel or receptacle heretofore referred to and which may be of any usual and suitable shape and formed of glass, porcelain, metal, or other uncorrodable material. Such receptacle is provided with a filling-orifice 28, closed by a suitable plug 29, with the before-mentioned attaching-neck 5 at top for engagement with the bottom neck 3 of the air-blast casing 1 and with an outlet-nozzle 30, of any usual construction, and through which the liquid contents of said receptacle is discharged in a sprayed or atomized condition for a wide number of uses, among which may be mentioned the spraying the person with perfumes or medicants, washing wounds, applying liquid insect-exterminators, &c. Such outlet-nozzle 30, however, in the preferred construction, as shown in Figs. 2 and 3 of the drawings, will consist of an external air-tube 31, connecting with the interior of the receptacle 27 at a point above the normal liquid level in the same and provided at its discharge end with a cone-shaped jet-head 32. Within said air-tube is arranged a smaller liquid-conducting tube 33, which at the end adjacent to the outlet of jet-head 32 is flattened to form a restricted outlet 34, as shown in Fig. 3, while the other end of said tube extends to near the bottom of the receptacle 27, as shown in Fig. 2.

In the use of the present invention, with the parts arranged as shown in Fig. 1, with such arrangement adapted for use in puffing insect-exterminating powders and the like the tubular neck 3 is closed by the cap 4, the valve 11 and its seat 12 having been removed and the outlet-nozzle 8 attached to the tubular neck 6. As so arranged the powder to be puffed is placed within the interior of the casing 1, preferably through the tubular neck 3. Then by an alternate depression and release of the diaphragms aforesaid by the hand or thumb of the operator the powder will be puffed through the nozzle 8 in a very perfect manner.

In the use of the present invention with an arrangement of parts as shown in Fig. 2 and adapted for use in spraying or atomizing liquid substances the nozzle 8 is removed and the lateral tubular neck 6 closed by the filling-plug 7. The cap 7 is also removed from the tubular neck 3 and the valve 11 and valve-seat 12 inserted in place, after which the receptacle 27 is screwed into place upon the neck 3. By a manipulation in the diaphragms in the manner above mentioned a constant pressure of air is created within the receptacle 27 to discharge the contents of same in a gradual and uniform manner and which discharge as it passes through the jet-head 32 is atomized in manner usual to such type of jet-heads.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an atomizing or spraying apparatus of the character herein described, the combination of a casing having an open rim at top, inner and outer flexible diaphragms, marginally secured to said rim and adapted for manual actuation, a valved air-inlet to said casing, and outlet-passage therefrom substantially as set forth.

2. In an atomizing or spraying apparatus of the character herein described, the combination of a casing having an open rim at top, inner and outer flexible diaphragms, marginally secured to said rim and adapted for manual actuation, a spring within said casing tending to force said diaphragms outward, a valved air-inlet to said casing, and an outlet therefrom, substantially as set forth.

3. In an atomizing or spraying apparatus of the character herein described, the combination of a casing having an open rim at top, inner and outer flexible diaphragms, marginally secured to said rim and adapted for manual actuation, a valved air-inlet to said casing, an outlet-passage from said casing provided with a removable valve-seat and valve, a liquid-receptacle connected with said outlet-passage, and a discharge-nozzle on said receptacle, substantially as set forth.

4. In an atomizing or spraying apparatus of the character herein described, the combination of a casing having an open rim at top, inner and outer flexible diaphragms, marginally secured to said rim and adapted for manual actuation, a valved air-inlet to said casing, an outlet-passage from said casing provided with a removable valve-seat and valve, a liquid-receptacle connected with said outlet-passage, and a discharge-nozzle on said receptacle, the same comprising an air-tube provided with a jet-head at its discharge end, and a smaller tube arranged within the air-tube and extending from the jet-head aforesaid to the

bottom of the receptacle substantially as set forth.

5. In an atomizing or spraying apparatus of the character herein described, the combination of a casing having an open rim at top, inner and outer flexible diaphragms marginally secured to said rim and adapted for manual actuation, a housing having a depending skirt engaging the exterior of the casing and adapted to inclose the diaphragms, a valved air-inlet to said casing, and an outlet-passage therefrom, substantially as set forth.

6. In an atomizing or spraying apparatus of the character herein described, the combination of a casing having an open rim at top, inner and outer flexible diaphragms, marginally secured to said rim and adapted for manual actuation, a spring-cap arranged beneath the inner diaphragm an intermediate plate arranged between the diaphragms, an outer plate arranged upon the outer diaphragm, a spring within the casing tending to force said diaphragms outwa , a valved air-inlet to said casing, and an outlet-passage therefrom, substantially as set forth.

7. In an atomizing or spraying apparatus of the character herein described, the combination of a flexible diaphragm, with a spring for moving said diaphragm in one direction, said spring consisting of two spiral intercoils, connected together at one end by an integral cross member, substantially as set forth.

Signed at Chicago, Illinois, this 22d day of August, 1903.

STEPHEN KETTLE.

Witnesses:
ROBERT BURNS,
W. H. HOLMES.