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W. A. BARTON.

ATOMIZING APPARATUS.

(Application filed Dec. 29, 1900.)

(No Model.)

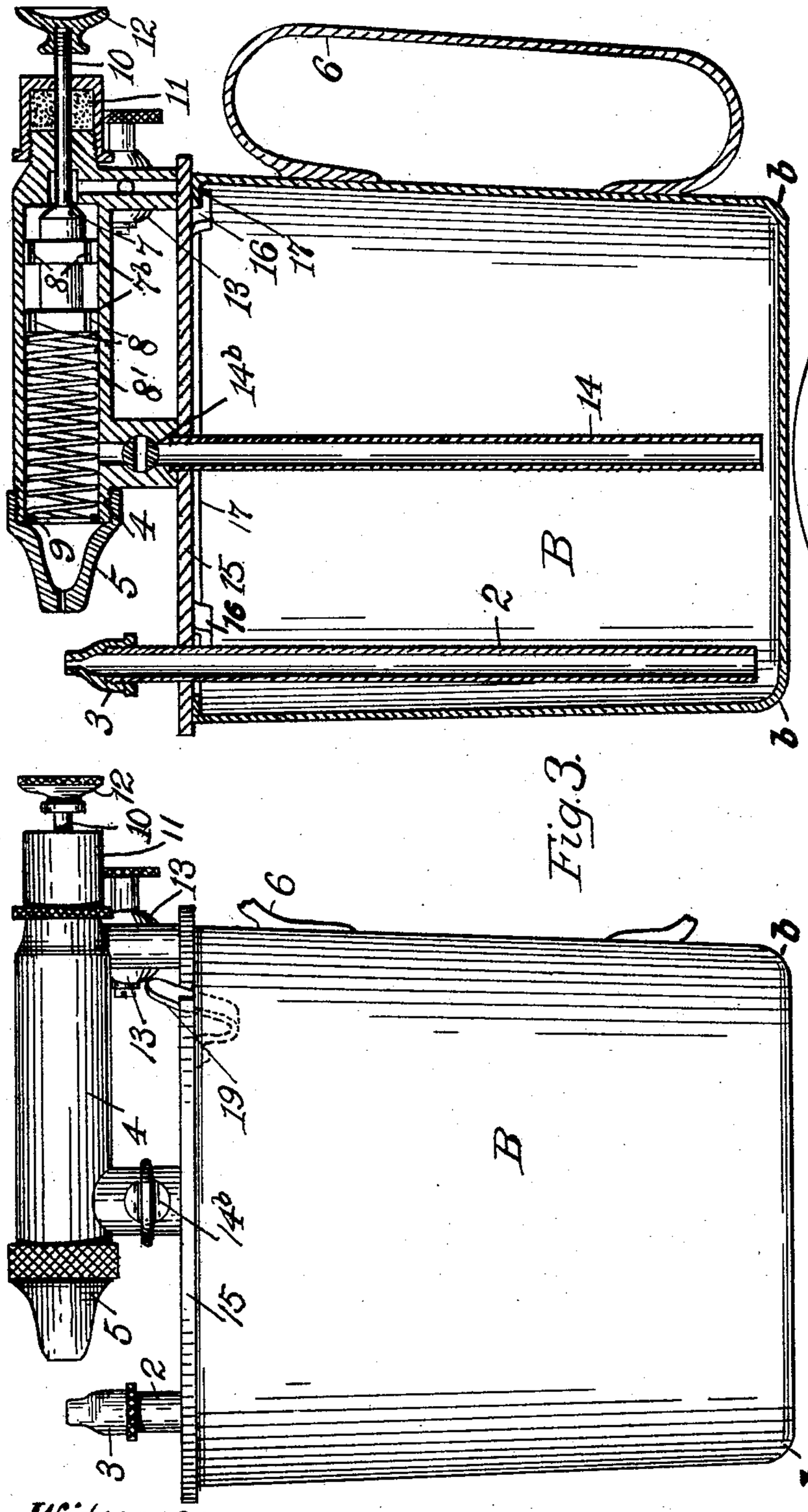

Fig. 3.

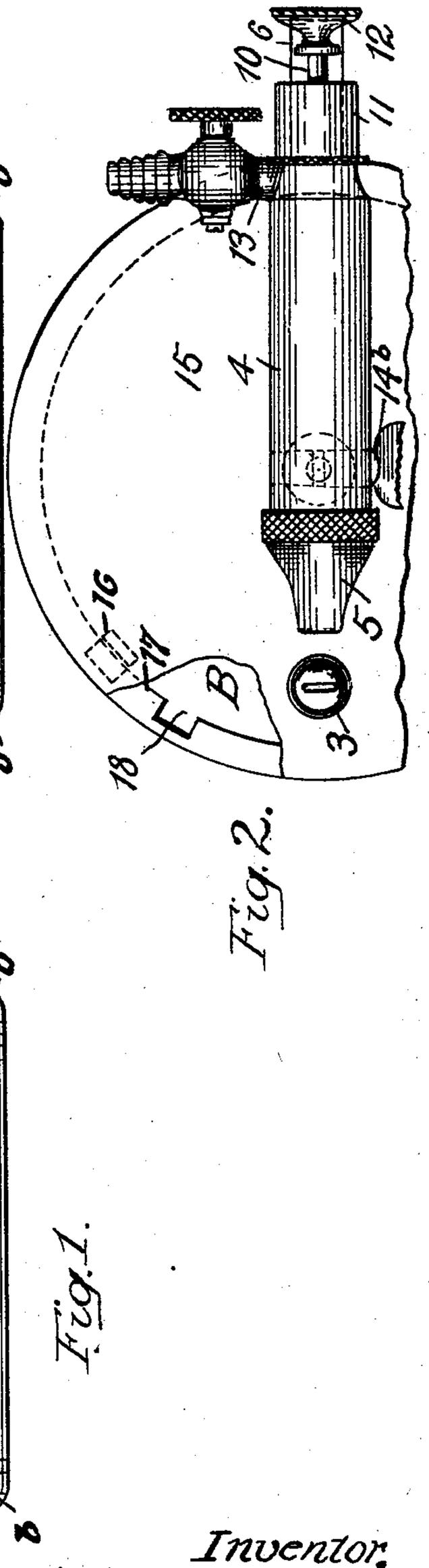

Fig. 2.

Fig. 1.

Witnesses.
A. Wells
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Inventor,
William A. Barton,
By his attorney,
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UNITED STATES PATENT OFFICE.

WILLIAM A. BARTON, OF JERSEY CITY, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO WALTER J. SMART, OF BROOKLYN, NEW YORK.

ATOMIZING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 696,158, dated March 25, 1902.

Application filed December 29, 1900. Serial No. 41,464. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. BARTON, of Jersey City, New Jersey, have invented a certain new and useful Improvement in Atomizing Apparatus, of which the following is a specification.

This invention relates to devices designed for the utilization of air under pressure in the projection of a liquid or other mobile substance toward or against a surface or object interposed in the path of a stream thereof. Such devices are used, for example, to effect an atomization or division into fine particles of paints, varnishes, lacquers, &c., and to thereupon apply the material in this condition to the surface to be treated.

It is an object of this invention to furnish a device or apparatus for this purpose whose construction is such as to present especial facilities for its cleansing, while its operation is at all times efficient and may be readily adapted to liquids of different degrees of fluidity or viscosity. Provision also exists for overcoming the tendency of a liquid to settle or separate into layers of different specific gravities, whereby the composition of the liquid applied to the surface may be kept substantially uniform. It is an object also of the present invention to provide a construction particularly suitable for application to a portable form of apparatus.

I will describe an apparatus embodying the features of my invention and subsequently define the novelty thereof in claims.

In the drawings which accompany this specification, Figure 1 is an elevation of such an apparatus. Fig. 2 is a top view thereof, and Fig. 3 is a central longitudinal section through the apparatus.

Similar characters of reference designate corresponding parts in all the figures of the drawings.

In the embodiment of the invention illustrated and particularly described the features thereof are applied to a portable form of apparatus.

A suitable tank or pot B of convenient size is provided for holding the liquid to be applied. This receptacle may be made of any suitable form and materal; but preferably the sides thereof will be connected to the bottom part by a portion making an obtuse angle with the connected parts of the receptacle where joined thereto, as such construction will present no corners or crevices for the lodgment of pigment or other sediment, and thereby facilitate the thorough stirring of the contained liquid. This connecting portion is designated by *b* and may have the curved form shown.

The material is raised from the receptacle by projecting a stream of air under pressure across and above the open end of a pipe or duct extending thereinto. This pipe is shown at 2 and preferably reaches to a point adjacent to the bottom of the receptacle in order that substantially all the material may be drawn from the latter. The upper or outlet orifice of this pipe 2 will preferably be formed in an adjustable and removable tip or nozzle 3, which may therefore be readily replaced by another if at any time it is desired to change to a nozzle having a differently-formed orifice or one of different dimensions. This orifice is shown as being elongated in one direction, and if the tip is made adjustable, as stated, the orifice may be brought with its longer axis into alinement with the air-tube, or the tip may be so adjusted that such axis will be disposed at an angle to the axis of the air-tube, whereby the character or form of the spray-stream may be regulated.

An air-tube 4 is located to deliver a stream of air above and across the orifice in the nozzle 3, and the exit-orifice of this air-tube may likewise be formed in a removable nozzle 5 to facilitate a change from a larger to a smaller sized orifice, or vice versa.

The air-tube 4 is valve-controlled, the valve being arranged in such a position relative to the handle 6 of the receptacle as to be in reach of the thumb or finger of the hand holding the apparatus.

Any suitable form and construction of valve may be used or that particular organization illustrated in the drawings attached to this specification. As therein set forth, a valve 7 is provided with piston-like extensions 7^b, adapted to slide through the body of the air-tube 4 and properly guide the valve toward and away from its seat. These extensions 7^b are provided with one or more passages 8 to

permit the free movement of the air forward, and one of the extensions is herein shown to form a bearing for a reseating-spring 8′, interposed between the extension and a shoulder 9, formed within the bore of the air-tube. If constructed and arranged according to the manner illustrated, the tension of this spring 8′ will be sufficient to close the valve against the pressure of the air, while the valve may be pressed away from its seat to permit the escape of air by means of a valve-stem 10, projecting outward through a stuffing-box 11 and provided with a thumb-piece 12 at its outer extremity, so located with respect to the aforementioned handle 6 as to be reached by the thumb or finger of the hand which grasps the handle.

A fitting 13, whose bore in the present instance communicates with the space to the rear of the valve 7, is secured to the tube 4 for the ready attachment of an air-supply pipe.

Many liquids used for treating surfaces, &c., tend to separate in time into different layers, depending upon the relative densities of their components, and thus destroy the uniformity of composition. It is desirable therefore to provide some means for occasionally stirring the material to render it homogeneous, and this I accomplish in the present apparatus by passing some of the compressed air into the liquid, preferably to a point adjacent to the bottom of the receptacle. This inlet of the air for the purpose of stirring is preferably under control. These results are attainable by the construction set forth, in which a pipe or duct 14, terminating near the bottom of the receptacle, is connected to the air-tube 4, while adjacent to this latter tube the passage through the pipe or duct 14 is preferably controlled by a valve 14^b of any desired construction. Assuming that this valve 14^b is open, it is manifest that each time the thumb-piece 12 is pressed inward a portion of the air which escapes past the valve 7 will pass downward through the pipe or duct 14 and agitate the liquid, resulting in a thorough mixing thereof. The thoroughness of this action is increased, as before stated, by a construction of the receptacle before referred to. This injection of air into the liquid may be suspended at any time by closing the valve 14^b.

For the purpose of rendering all parts of the receptacle accessible and unobstructed by any of the details of the apparatus with the object of facilitating the cleaning of the latter the position of these various details and features will preferably be so related to the receptacle as not to interfere or be in the way in getting at the surfaces to be cleaned. Their relation and construction may also be such as to permit them and the receptacle to be cleaned independently of each other. For instance, they may be located upon a part or plate which is detachably secured to the receptacle. Such is the construction set forth in the drawings, where this removable plate 15 is shown as constituting a cover for the receptacle, to which the air-tube 4 and fluid-outlet pipe 2 are secured.

In practical use the apparatus is likely to receive more or less rough treatment, and I therefore deem it advisable to securely and positively interlock the cover to the tank in order to prevent their accidental disengagement. Means for this purpose are shown consisting of a so-called "bayonet-joint connection" having a construction comprising a suitable number of lugs 16, attached to the plate 15, into a channel on each of which the inwardly-projecting upper lip 17 of the receptacle enters when the plate is in place. Notches 18, corresponding in number to the number of lugs 16, permit the plate to be applied to the receptacle, when upon turning them slightly relatively to each they are secured one to another, a spring-finger 19 snapping into a notch, here shown to consist of one of the notches 18.

Constructed as illustrated and described for portable use it is evident that upon the delivery of air under pressure to the apparatus the same may be readily manipulated to spread a liquid in an atomized condition, whether it be a varnish, a lacquer, a paint, or a japan or any other mobile material capable of being drawn upward through a suction-tube. Furthermore, the force and volume of the issuing air may also be regulated by a varying pressure on the thumb-piece, while the contained liquid may be agitated at any time to render it homogeneous by the regulation of the valve 14^b, the air escaping from the receptacle through the joint between the receptacle and plate 15.

A detachment of the plate from the receptacle permits the liquid to be poured into the latter, while from the fact that the features and details may be removed from the receptacle they may all be readily and expeditiously cleaned.

Having described my invention, I claim—

1. In a portable atomizing apparatus, the combination with a tank, of an air-tube mounted upon the apparatus, a liquid-outlet tube also mounted upon the apparatus and across the upper end of which said air-tube is adapted to deliver a stream of air and a tip in which the orifice of the liquid-outlet tube is formed, said orifice being elongated in one direction and the tip being adjustably secured to the liquid-outlet tube whereby said orifice may be adjusted and its longer axis brought into alinement with the axis of the air-tube or positioned at an angle thereto and the form of the spray-stream thereby altered.

2. In a portable atomizing apparatus, the combination with a tank of an air-tube mounted upon the apparatus, a liquid-outlet tube also mounted upon the apparatus and across the upper end of which said air-tube is adapted to deliver a stream of air, a removable tip secured to the air-tube, and a tip in which the orifice of the liquid-outlet tube is formed, said orifice being elongated in one

direction and the tip in which this orifice is formed being adjustably secured to the liquid-outlet tube whereby said orifice may be adjusted and its longer axis brought into alinement with the axis of the air-tube or positioned at an angle thereto and the form of the spray-stream altered.

3. In a portable atomizing apparatus, the combination with a tank, of a handle secured thereto; a liquid-outlet tube mounted upon the apparatus and terminating at its lower end adjacent to the bottom of the tank; an air-tube mounted upon the apparatus with its axis disposed at an angle to the axis of the liquid-outlet tube and its orifice in a position adapting it to project a stream of air across the upper end of the liquid-outlet tube; a tube extending from the air-tube into the tank for the agitation of the contents thereof; a normally closed valve in the air-tube; a valve-stem projecting from the air-tube and terminating within convenient reach of the hand when grasping said handle; and means for attaching a conduit for compressed air to the air-tube.

4. In a portable atomizing apparatus, the combination with a tank, of a handle secured thereto; a liquid-outlet tube mounted upon the apparatus and terminating at its lower end adjacent to the bottom of the tank; a tip in which the orifice of the liquid-outlet tube is formed, said orifice being elongated in one direction and the tip being adjustably secured to the liquid-outlet tube; an air-tube mounted upon the apparatus with its axis disposed at an angle to the axis of the liquid-outlet tube and its orifice in a position adapting it to project a stream of air across the said tip secured to the liquid-outlet tube; a normally closed valve-stem projecting from the air-tube and terminating within convenient reach of the hand when grasping said handle; and means for attaching a conduit for compressed air to the air-tube.

5. In a portable atomizing apparatus, the combination with a tank, of a handle secured thereto; a cover removably engaged therewith; a liquid-outlet tube mounted upon the apparatus and terminating at its lower end adjacent to the bottom of the tank; a tip in which the orifice of the liquid-outlet tube is formed; said orifice being elongated in one direction and the tip being adjustably secured to the liquid-outlet tube; an air-tube secured to said cover with its axis disposed at an angle to the axis of the liquid-outlet tube and its orifice in a position adapting it to project a stream of air across the said tip secured to the liquid-outlet tube; a normally closed valve in the air-tube; a valve-stem projecting from the air-tube and terminating within convenient reach of the hand when grasping said handle; and means for attaching a conduit for compressed air to the air-tube.

6. In a portable atomizing apparatus, the combination with a tank of a handle secured thereto; a cover removably engaged therewith; a liquid-outlet tube mounted upon the apparatus and terminating at its lower end adjacent to the bottom of the tank; an air-tube secured to said cover with its axis disposed at an angle to the axis of the liquid-outlet tube and its orifice in a position adapting it to project a stream of air across the said liquid-outlet tube; a valve-controlled tube extending from the air-tube into the tank for the agitation of the contents thereof; a normally closed valve in the air-tube; a valve-stem projecting from the air-tube and terminating within convenient reach of the hand when grasping said handle; and means for attaching a conduit for compressed air to the air-tube.

7. In a portable atomizing apparatus, the combination with a tank of a handle secured thereto; a cover removably engaged therewith; a liquid-outlet tube mounted upon the apparatus and terminating at its lower end adjacent to the bottom of the tank; a tip in which the orifice of the liquid-outlet tube is formed, said orifice being elongated in one direction and the tip being adjustably secured to the liquid-outlet tube; an air-tube secured to said cover with its axis disposed at an angle to the axis of the liquid-outlet tube; a tip in which the orifice of the air-tube is formed, and which is removably secured to said air-tube; a normally closed valve in the air-tube; a valve-stem projecting from the air-tube and terminating within convenient reach of the hand when grasping said handle and means for attaching a conduit for compressed air to the air-tube.

8. In a portable atomizing apparatus, the combination with a tank, of a handle secured thereto; a removable cover adapted to positively interlock with the edge of the tank and be prevented thereby from accidental disengagement from the tank; a liquid-outlet tube mounted upon the apparatus and terminating at its lower end adjacent to the bottom of the tank; a tip in which the orifice of the liquid-outlet tube is formed; said orifice being elongated in one direction and the tip being adjustably secured to the liquid-outlet tube; an air-tube secured to said cover with its axis disposed at an angle to the axis of the liquid-outlet tube and its orifice in a position adapting it to project a stream of air across the said tip secured to the liquid-outlet tube; a normally closed valve in the air-tube; a valve-stem projecting from the air-tube and terminating within convenient reach of the hand when grasping said handle and means for attaching a conduit for compressed air to the air-tube.

9. In a portable atomizing apparatus, the combination with a tank of a handle secured thereto; a removable cover adapted to positively interlock with the edge of the tank, and be prevented thereby from accidental disengagement from the tank; a liquid-outlet tube mounted upon the apparatus and terminat-

ing at its lower end adjacent to the bottom of the tank; an air-tube secured to said cover with its axis disposed at an angle to the axis of the liquid-outlet tube and its orifice in a position adapting it to project a stream of air across the said liquid-outlet tube; a valve-controlled tube extending from the air-tube into the tank for the agitation of the contents thereof; a normally closed valve in the air-tube; a valve-stem projecting from the air-tube and terminating within convenient reach of the hand when grasping said handle; and means for attaching a conduit for compressed air to the air-tube.

10. In a portable atomizing apparatus, the combination with a tank, of a handle secured thereto; a removable cover adapted to positively interlock with the edge of the tank and be prevented thereby from accidental disengagement from the tank; a liquid-outlet tube mounted upon the apparatus and terminating at its lower end adjacent to the bottom of the tank; a tip in which the orifice of the liquid-outlet tube is formed, said orifice being elongated in one direction and the tip being adjustably secured to the liquid-outlet tube; an air-tube secured to said cover with its axis disposed at an angle to the axis of the liquid-outlet tube and its orifice in a position adapting it to project a stream of air across the said tip secured to the liquid-outlet tube; a normally closed valve in the air-tube; a valve-stem projecting from the air-tube and terminating within convenient reach of the hand when grasping said handle and means for attaching a conduit for compressed air to the air-tube.

11. In a portable atomizing apparatus, the combination with a tank, of a handle secured thereto; a removable cover adapted to positively interlock with the edge of the tank, and be prevented thereby from accidental disengagement from the tank; a liquid-outlet tube mounted upon said cover and terminating at its lower end adjacent to the bottom of the tank; an air-tube secured to said cover with its axis disposed at an angle to the axis of the liquid-outlet tube and its orifice in a position adapting it to project a stream of air across the said liquid-outlet tube; a valve-controlled tube extending from the air-tube into the tank for the agitation of the contents thereof; a normally closed valve in the air-tube; a valve-stem projecting from the air-tube and terminating within convenient reach of the hand in grasping said handle; and means for attaching a conduit for compressed air to the air-tube.

12. A portable atomizing apparatus having in combination with a tank and a cover removably secured thereto, of an air-tube and a liquid-outlet tube secured to the cover, a valve mounted in the air-tube and provided with cylindrical perforated extensions adapting the valve to slide to and fro in the air-tube and coöperate with its seat; a spring for urging the valve in one direction; a valve-stem projecting from the valve outward from the air-tube; and a finger-piece upon said valve-stem.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

WILLIAM A. BARTON.

Witnesses:
PIERSON L. WELLS,
RUDOLPH LORECK.