

T. A. DE VILBISS.

AIR BRUSH.

APPLICATION FILED NOV. 29, 1909.

977,281.

Patented Nov. 29, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

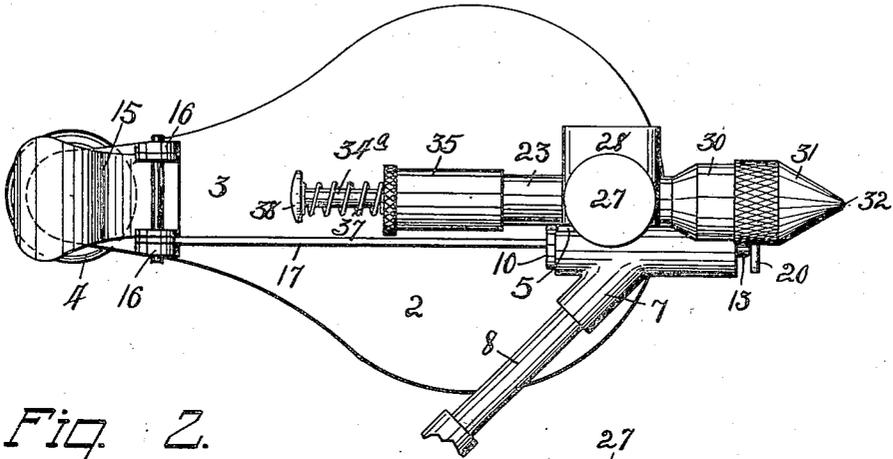
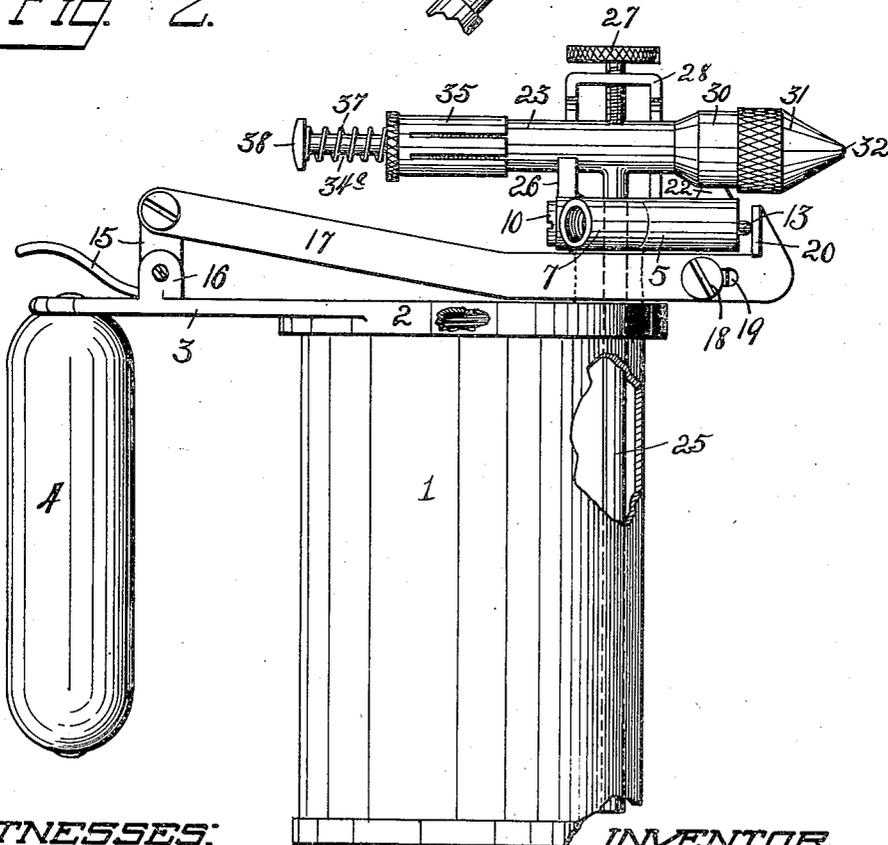


Fig. 2.



WITNESSES:

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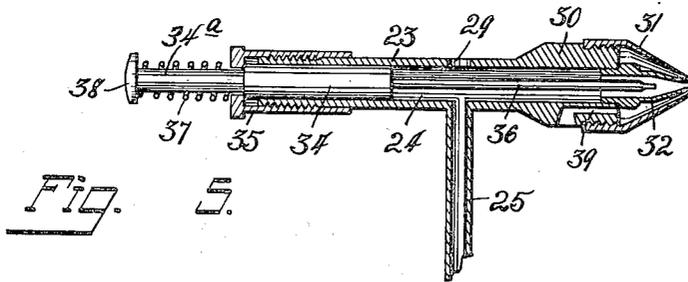
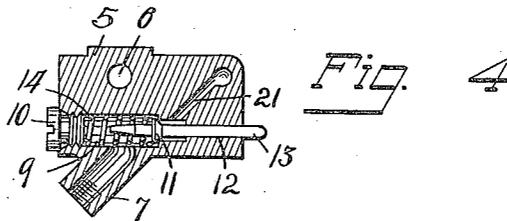
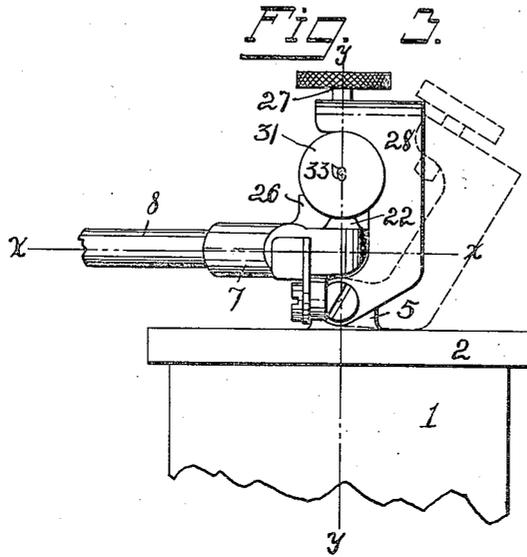
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By Owen & Owen,
His attys.

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UNITED STATES PATENT OFFICE.

THOMAS A. DE VILBISS, OF TOLEDO, OHIO, ASSIGNOR TO THE DE VILBISS MANUFACTURING COMPANY, OF TOLEDO, OHIO, A CORPORATION OF OHIO.

AIR-BRUSH.

977,281.

Specification of Letters Patent. Patented Nov. 29, 1910.

Application filed November 29, 1909. Serial No. 530,359.

To all whom it may concern:

Be it known that I, THOMAS A. DE VILBISS, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have invented a certain new and useful Air-Brush; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to air-brushes or atomizers of the type particularly adapted for applying lacquer, varnish, paint, bronze or other liquid pigment in spray form upon any surface.

The object of my invention is the provision of an improved apparatus of this class, which is simple and efficient in its construction and operation, capable of having its parts easily and quickly disassembled for the purpose of cleaning, and which is provided with a combined throat cleaning and spray regulating member, which is capable of adjustment to regulate the density of the spray and of movement to clean the discharge end of the spray-head throat without disturbing the adjusting means.

The invention is fully described in the following specification, and while in its broader aspect it is susceptible of embodiment in numerous forms, a preferred embodiment of the same is illustrated in the accompanying drawings, in which,—

Figure 1 is a top plan view of an apparatus embodying my invention. Fig. 2 is a side elevation of the same with portions of the liquid receptacle broken away. Fig. 3 is a front view of the same with the lower portion of the receptacle broken away. Figs. 4 and 5 are sections of parts on the lines $x x$ and $y y$, respectively, in Fig. 3.

Referring to the drawings, 1 designates a liquid receptacle to the open top of which is threaded or otherwise suitably secured a cover or cap 2, having an arm 3 projecting from one side thereof, to the outer end of which arm is secured a pendent handle 4. Rising from the top of the cover 2, preferably adjacent the edge thereof opposed to the arm 3, is a standard or boss 5 having a

hole 6 provided vertically therethrough and opening at its lower end into the interior of the receptacle. The upper end of the boss 5 is shown as being enlarged and provided at one side with a nipple 7 to which a pipe or tube 8, leading to any suitable source of fluid pressure supply, is attached. The bore of this nipple communicates with a valve-chamber 9, which is provided in the enlarged portion of the boss 5 at one side of the hole 6, and has its outer end closed by a screw-plug 10. The inner end portion of the chamber 9 is slightly reduced to provide a shoulder for the valve 11 to seat against, and has a restricted aperture 12 extending forwardly therefrom to the forward side of the boss head to closely receive the valve-stem 13. The valve 11 is normally held seated by a compression spring 14 within the valve-chamber, the opposite ends of which are against the plug 10 and valve.

A bell-crank thumb lever 15 is fulcrumed to ears 16 rising from the arm 3 of the cover adjacent its outer end and has its upwardly extending arm pivoted to the rear end of a link or bar 17. This bar is guided for reciprocatory movements by a screw 18 working through a slot 19 in such bar and threading into an ear on the under side of the enlargement of the boss 5, and has its forward end formed with a turned up lip 20 for co-acting with the forwardly projecting end of the valve stem 13. It is evident that on a depression of the thumb-piece of the lever 15, the link or bar 17 moves the stem 13 to unseat the valve.

A by-pass 21 leads laterally from the reduced portion of the valve-chamber 9 and communicates with the bore of a nipple 22 on the top of the forward end portion of the boss enlargement.

23 designates a spray-head of elongated form having the straight longitudinal bore 24 therethrough and the liquid supply tube 25 extending laterally therefrom intermediate its ends and projecting through the boss hole 6 into the receptacle 1 to adjacent the bottom thereof, as indicated in Figs. 2 and 5. The head 23 rests on a crotch-lug 26 rising from the rear side of the boss 5 and on the nipple 22, being held to its seat thereon by a set-screw 27, which is carried by a swinging bracket 28. This bracket is pivoted to the boss 5 and projects upwardly

therefrom at the side of the head 23, the screw 27 being threaded through a part thereof adapted to overhang the head. The end of the screw 27 when seated on the head 23 closes a clean-out opening 29 therein, which opening registers with the passage through the tube 25 to facilitate a cleaning of the tube.

The forward end of the head 23 is enlarged or has its wall thickened, as at 30, and threaded onto this is an air or fluid-nozzle 31, which is shown as tapering to an apertured point. A liquid-nozzle 32 is disposed within the fluid-nozzle 31, being threaded into the forward end of the bore 24 of the head, and instead of having its restricted discharge end terminating short of the outer edge of the discharge aperture of the fluid-nozzle 31, as is common in atomizing instruments, such end is projected through the discharge aperture of the fluid-nozzle 31, at least to the outer edge thereof and preferably slightly beyond, as indicated in Fig. 5. The importance of thus projecting the end of the inner nozzle through the restricted discharge orifice of the fluid-nozzle is very great to the practical operation of a device for spraying liquids such as varnish, lacquer or the like, as the discharging liquid is thus prevented from having contact with and accumulating on the outer edge of the discharge throat of the fluid-nozzle whereby to obstruct the fluid discharge. This arrangement also enables the end of the liquid nozzle to be frequently wiped off by rubbing a finger across it to clean it of accumulated matter. The discharge opening in the end of the fluid-nozzle 31 is preferably elongated transversely thereof to provide fluid discharge openings at opposite sides of the liquid-nozzle, as shown at 33, Fig. 3, as it is found that the directing of the fluid discharge in such manner effects a more thorough breaking up of the discharging liquid.

Mounted in the rear end of the bore of the head 23 is a plunger 34, which has a stem 34^a projecting from its rear end through a stop-cap 35, threaded upon the rear end of such head, and has a pin or stem 36 projecting from its forward end to within the bore of the liquid-nozzle 32, as shown in Fig. 5. The forward end of the pin or stem 36 is reduced to adapt it to project through the restricted discharge passage of the liquid-nozzle to effect a cleaning out of such passage when the plunger is moved forward. The plunger 34 is normally held retracted by a coiled-spring 37, which encircles the stem 34^a and has its ends thrust against the cap 35 and the head 38 of such stem. The stop-cap 35 is mounted for longitudinal adjustment on the head 23 to enable the stem 36 to be normally projected a greater or less distance within the conically reduced for-

ward end portion of the liquid-nozzle bore or throat, thus enabling the volume of the liquid discharge and consequent density of the spray to be increased or diminished as desired.

The head 23 is provided in the thickened portion 30 of its wall with a fluid-passage 39, which has its forward end opening into the fluid-chamber between the fluid and liquid-nozzles and its rear end terminating in a laterally-extending mouth of suitable size and shape to fit over the nipple 22 on the boss 5, thus providing communication between said fluid chamber and the source of fluid-supply.

It is apparent that I have provided an atomizer or air-brush which is commercially practical for the spraying of lacquer, varnish, paint or other liquids of a sticky adherent nature, due to the relatively arranging of the discharge ends of the fluid and liquid nozzles so as to prevent the contact of the discharging liquid with the fluid-nozzle, thus reducing the clogging tendency to a minimum, and enabling the discharge end of the liquid-nozzle to be easily and readily cleaned of accumulated matter. It is also evident that the throat of the liquid-nozzle may be quickly and easily cleaned of accumulated matter by simply pressing inwardly on the stem 34^a of the plunger 34, which forces the pointed end of the stem 36 through the restricted discharge end of the nozzle. The matter thus forced from the nozzle throat may be wiped from the end thereof by a thumb or finger. The spray-head and liquid tube may also be quickly removed from the receptacle for the purpose of cleaning by simply loosening the screw 27 to permit the bracket 28 to be swung back and then raising the head to withdraw the tube from the receptacle.

I wish it to be understood that my invention is not limited to any specific construction or arrangement of the parts except in so far as such limitations are specified in the claims.

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

1. In an air-brush, a spray-head, a combined cleaning and spray regulating member movably mounted in the throat of such head, adjustable means for regulating said member and limiting the movement thereof away from the discharge end of the throat, and means influencing such movements of said member.

2. In an air-brush, the combination with a spray-head, of a member mounted in the spray-head throat and manually movable in one direction to eject matter from the discharge end of such throat, means influencing the movement of such member in the opposite direction, and adjustable means for

limiting the movement of such member in said opposite direction to regulate the spray density, substantially as described.

3. In an air-brush, the combination with a spray-head of a combined throat cleaning and spray regulating member mounted in the spray-head throat and manually movable in one direction to clean the discharge end of such throat and automatically movable in the other direction to retract said member, and adjustable means for limiting the automatic movements of such member.

4. In an air-brush, the combination with a spray-head, of a combined throat cleaning and spray regulating member movably mounted in the spray-head throat and having a part projecting without such throat, an element adjustably carried by the head and cooperating with the member to limit its regulating movement away from the discharge end of said throat, and means yieldingly retaining the member retracted from the throat discharge, substantially as described.

5. In an instrument of the class described, the combination with a spray-head having a straight bore therethrough and a discharge nozzle at one end thereof, such nozzle having a part conically reduced to form a restricted discharge-orifice, of a plunger mounted for yielding movements in said bore and having a stem projecting therefrom into the nozzle throat to adjacent its restricted discharge-orifice and manually movable to eject matter from such orifice, means for normally maintaining the plunger in retracted position, and adjustable means for limiting the retracting movements of the plunger, the adjustment of such means being determined by the required spray density.

6. In an instrument of the class described, a spray-head having a discharge nozzle, a member adjustably carried by said head to the rear of its nozzle, a spray-regulating and throat cleaning needle capable of reciprocatory movements within the spray-head and through said member, said needle having a part for coacting with said member to limit its rearward movements and a spring acting on the needle to normally retain it at the limit of its rearward movement.

7. In an air-brush, a spray-head having a contracted nozzle, a spray-regulating and nozzle-throat cleaning needle reciprocally movable within the spray-head and having a part projecting without the spray-head, means adjustably carried by the spray-head for limiting the rearward movements of the needle, and a spring acting to normally hold the needle in retracted position relative to the nozzle.

8. In an air-brush, a spray-head, a combined cleaning and spray-regulating needle reciprocally movable in the throat of such

head and having its rear end projecting without the spray-head in exposed position, a member adjustably carried by the head and serving as a stop for the needle to limit the movement thereof away from the discharge end of the throat and a spring influencing such movements of the needle.

9. In an air-brush, an elongated spray-head having a bore therethrough with a nozzle at one end and open at its other end, a tube communicating with such head intermediate its ends, a plunger mounted in the head to the rear of said tube, said plunger having a nozzle cleaning and spray-regulating needle projecting forwardly therefrom and a headed stem projecting rearwardly therefrom without the rear end of the spray-head, a member adjustably carried by the rear end of the spray-head for regulating said plunger and limiting the rearward movements thereof, and means influencing the rearward movements of the plunger.

10. In an air-brush, an elongated spray-head having a nozzle at one end and its opposite end open, a spray-regulating and nozzle cleaning needle mounted for reciprocatory movements within the spray-head and having a part projecting without the open end thereof, means threaded for longitudinal adjustment on the open end of the spray-head and serving to regulate said needle and limit its rearward movements, both said needle and means having portions exposed to facilitate a manual movement thereof, and means coacting with the needle to normally retain it in retracted position relative to the nozzle.

11. In an instrument of the class described, a liquid receptacle, a spray-head having a liquid tube projecting therefrom into the receptacle, means on the receptacle loosely supporting said head and tube in operative position, and means for clamping the head and tube in such position and movable to permit a removal of said head from said supporting means.

12. In an instrument of the class described, a receptacle having a seat on its top, an elongated spray-head resting on such seat and having a tube projecting from one side thereof through the top of the receptacle to adjacent the bottom thereof and a swinging clamp for holding said spray-head to its seat on the top of the receptacle.

13. In an instrument of the class described, a receptacle, an elongated spray-head loosely seated on the top of such receptacle and having a liquid supply tube projecting down into the receptacle, a swinging bracket attached to the top of the receptacle and a set-screw carried by said bracket and adapted to cooperate therewith to retain the spray-head to its seat on the receptacle.

14. In an instrument of the class de-

scribed, a receptacle, a spray-head seated on the top thereof and having a liquid supply tube projecting down into the receptacle and a clean-out opening in register with the
 5 passage through said tube, a swinging bracket carried by the receptacle, and a member adjustably carried by said bracket and adapted to cooperate with the bracket to hold the spray-head to its seat and to close
 10 said clean-out opening.

15. In an air-brush, a liquid receptacle, a spray-head having a liquid tube projecting therefrom into the receptacle, said spray-head being loosely supported in operative
 15 position by the receptacle, and means swingingly carried by the receptacle for removably clamping the head in such position.

16. In an instrument of the class described, a receptacle, a boss rising from the
 20 top of such receptacle and having a nipple on its top, the bore of which is in valve controlled communication with a source of

fluid pressure and having a bracket portion, a spray-head seated on said bracket and having outer and inner fluid and liquid discharge nozzles, respectively, and a passage
 25 in communication with the fluid nozzle and provided with a mouth at one end adapted to fit over said nipple, a liquid supply tube projecting laterally from the throat of said
 30 spray-head through said boss and into the receptacle, a swinging member attached to the receptacle and a set-screw carried by said member and adapted to cooperate therewith to hold the spray-head to its seat on
 35 said bracket and nipple.

In testimony whereof, I have hereunto signed my name to this specification in the presence of two subscribing witnesses.

THOMAS A. DE VILBISS.

Witnesses:

C. W. OWEN,
 CORNELL SCHREIBER.