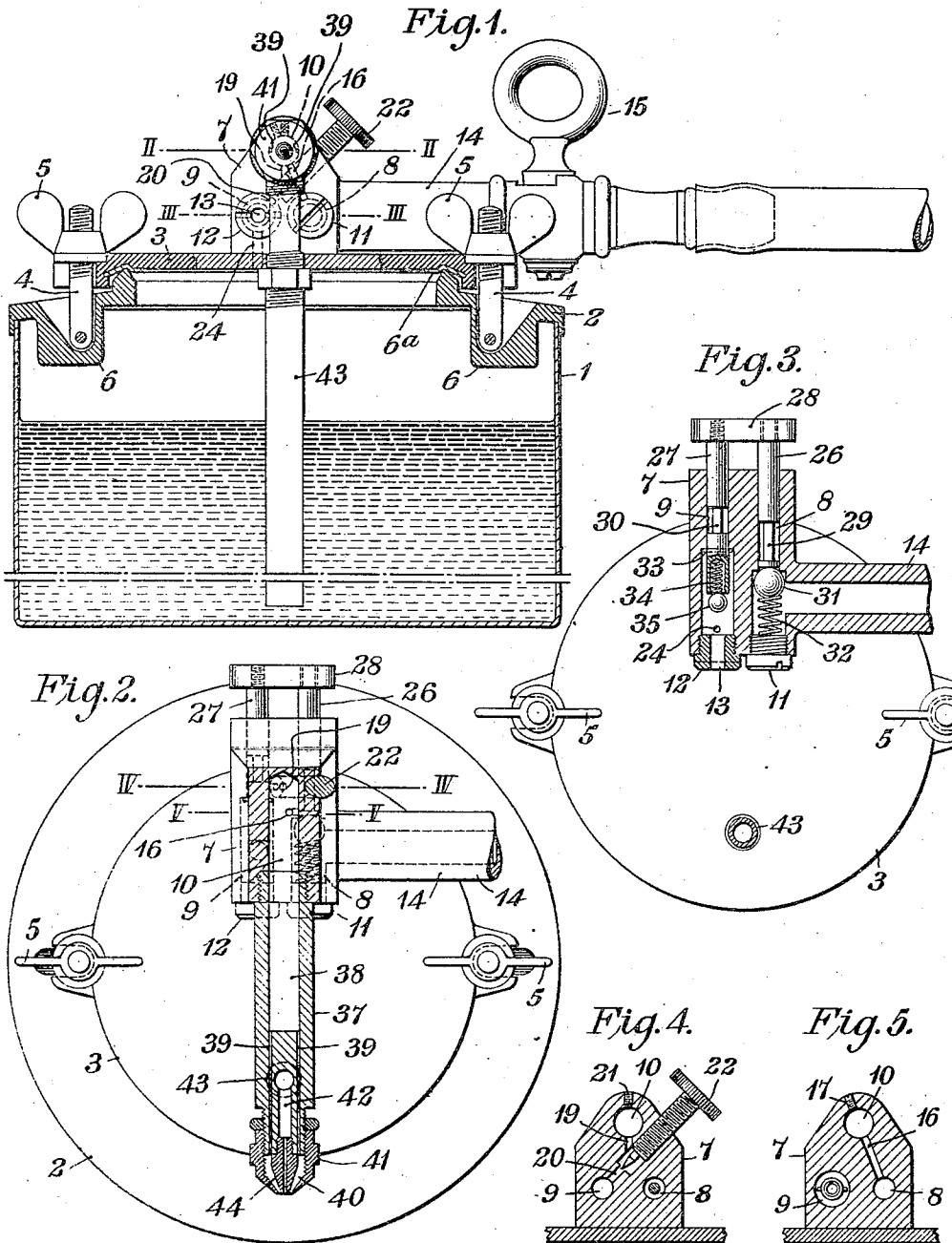


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SPRAYING DEVICE.

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968,210.

Patented Aug. 23, 1910.



WITNESSES:

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GUSTAVE A. URBACH, OF PITTSBURG, PENNSYLVANIA.

SPRAYING DEVICE.

968,210.

Specification of Letters Patent. Patented Aug. 23, 1910.

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To all whom it may concern:

Be it known that I, GUSTAVE A. URBACH, a citizen of the United States, and a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Spraying Devices, of which the following is a specification.

My invention relates to devices for spraying or atomizing paints and other liquids, and it has for its object to provide a device of this character in which air is shunted from a nozzle into the liquid receptacle and there utilized to apply pressure to the surface of the liquid for the purpose of assisting its discharge from the nozzle, and in which simple, effective and reliable means are employed for governing the supply of air both to the nozzle and to the liquid receptacle.

Figure 1 of the accompanying drawing is a view, in side elevation, of a device embodying the present invention, some of the parts being broken away for the sake of clearness of illustration. Fig. 2 is a plan and sectional view of the device, the sectional view being along the line II—II of Fig. 1. Fig. 3 is another plan and sectional view of the device, the sectional view being along the line III—III of Fig. 1. Fig. 4 is a part sectional view of the device along the line IV—IV of Fig. 2, and Fig. 5 is a part sectional view of the device along the line V—V of Fig. 2.

The device comprises a receptacle 1 having an annular top member 2, to which a cap 3 is secured by means of bolts 4 and wing nuts 5, the lower ends of the bolts being pivoted in blocks 6 that have recesses in their upper sides and that are soldered or otherwise so secured to the lower sides of the top member 2 as to provide an air-tight joint. A lead or other suitable gasket 6* is interposed between the top member 2 and the cover 3, the top member 2 being provided with a short cylindrical extension at its inner edge that is tapered to a rather sharp edge and is seated in the gasket 6* which is compressed and forced into a seat therefor in the cover 3, an air-tight joint between the top member 2 and the cover 3 being thus provided.

Upon the upper face of the cap 3 is a block 7 that is either formed integral therewith or is suitably secured thereto, and that is provided with three parallel, longitudinal,

cylindrical chambers 8, 9 and 10, the chamber 8 being an inlet chamber, the chamber 9 an auxiliary outlet chamber, and the chamber 10 the main outlet chamber. The chambers 8 and 9 are of larger size, or diameter, at one end than at the other end, and the larger ends are closed by means of screws 11 and 12, the screw 12 having an aperture 13 that provides a communicating passage between the chamber 9 and the exterior.

Extending from one side of the block 7 is an air-supply pipe 14, that communicates with the inlet chamber 8 at its larger end, and that is provided with a stop-cock 15 whereby the air pressure may be turned on and off, or regulated, the pipe 14 being connected, when the device is in use, with any suitable source of air pressure (not shown). The smaller portion of the inlet chamber 8 is connected to the main outlet chamber 10 by means of a passage 16, that is drilled from the top of the block 7 downwardly and at a slight inclination to the vertical, and the upper end of which is closed by means of a tap screw 17. The main outlet chamber 10 is connected with the smaller portion of the auxiliary outlet chamber 9 by means of two communicating drilled passages 19 and 20, respectively, the passage 19 extending vertically downward from the top of the block, and the passage 20 extending from the side of the block inwardly to the chamber 9 at an inclination to the vertical. The upper end of the passage 19 is closed by means of a tap screw 21, and the outer end of the passage 20, which is of larger size, or diameter, than its inner end, is closed by means of a screw 22 having a pointed inner end that extends into the smaller portion of the passage, the screw 22 being provided for the purpose of regulating the degree of communication between the main and auxiliary outlet chambers. The larger end of the auxiliary outlet chamber 9 is connected by means of a passage 24 with the interior of the receptacle 1, the air for supplying pressure to the surface of the liquid within the receptacle being admitted through this passage.

In the smaller ends of the inlet and auxiliary outlet chambers 8 and 9 are pistons 26 and 27, respectively, that are connected at their outer ends by means of a plate 28 whereby both pistons are operated simultaneously, and that are provided with reduced portions 29 and 30, respectively, the

reduced portion 29 of the piston 26 being near its inner end, and the reduced portion 30 of the piston 27 being at approximately its middle. The piston 26 is provided for the purpose of operating a valve which governs the admission of air from the larger end of the inlet chamber 8 to the smaller end, and from there through the passage 16 into the main outlet chamber 10, the said valve comprising a ball 31 that is normally pressed against a seat provided therefor at the junction of the smaller and larger portions of the inlet chamber 8, by means of a helical compression spring 32 that is interposed between the ball and the inner end of the screw 11. The spring 32 also serves to normally maintain the pistons 26 and 27 in the positions shown.

It will be noted that the air pressure within the larger end of the inlet chamber assists the spring 32 in maintaining the ball 31 against its seat. The piston 26 is reduced adjacent to the opening of the passage 16 into the chamber 8, so that when the ball is raised from its seat, air may enter the said passage. The position of the reduced portion 30 of the piston 27 is such that, when the piston is pressed inwardly, it is first brought opposite the opening of the passage 20 into the smaller end of the chamber 9, and is then caused to extend into the larger end of the said chamber, thus permitting communication between the main and auxiliary outlet chambers, through the passages 19 and 20. Extending through the piston 27, near its inner end, is a pin 33, that is provided for the purpose of preventing withdrawal of the pistons from the chambers 8 and 9. The inner end of the piston 27 is recessed for the reception of a helical compression spring 34 to the outer end of which a ball 35 is secured, the said ball being pressed against a seat, provided therefor in the inner end of aperture 13 in the screw 12, when the piston 27 has reached, or nearly reached, the inner limit of its travel, communication of the chamber 9 with the exterior being thereby cut off. Air is then discharged from the chamber 9 into the receptacle 1.

Screwed into one end of the block 7 is a rod 37 that is partially bored out at the end that is screwed into the block 7 to form an extension of the main outlet chamber 10. Communication is effected, by means of passages 39, between the recess 38 and an annular nozzle chamber 40 within a cap 41 that is threaded upon the free end of the rod and is provided with a central aperture in its end. The free end of the rod 37 is also centrally and laterally drilled to provide a passage 42 that is connected, by means of a pipe 43, with the bottom of the receptacle 1, an air-tight joint being provided between the cover and the pipe at the

point where the pipe passes through the cover. Screwed into the end of the rod 37 is a member 44 having a conical end and a central aperture forming an extension of the passage 42. By adjusting the position of the cap 41 longitudinally of the end of the rod 37, the rate of air discharge from the nozzle may be regulated.

Upon applying pressure to the plate 28, the ball 31 is first raised from its seat and air is then admitted from the inlet chamber 8 to the main outlet chamber 10, from where it is discharged, through the passages 39, into the nozzle chamber 40, and from there it escapes into the atmosphere through the annular opening, the edges of the aperture in the end of the cap 41 and the end of the member 44. In this manner, suction is produced which tends to draw liquid from the receptacle 1 through the pipe 43 and the passage 42. As the piston 27 is pressed inwardly, air is also admitted from the chamber 10 to the chamber 9, from which it may escape into the atmosphere through the aperture 13 in the screw 12 until the ball 35 reaches its seat. When the piston 27 reaches the inner limit of its travel, the ball 35 closes the aperture 13, and air pressure is then admitted, through the passage 24, to the receptacle, where it is applied to the surface of the liquid, and acts as the main force in effecting its discharge through the pipe 43 and the passage 42, the liquid being atomized as it is discharged at the nozzle. Upon relieving the pressure upon the plate 28, the ball 35 first recedes from its seat, and the air pressure within the chamber 9 and the receptacle 1 is relieved, because the passage 24 and the aperture 13 provide communication between the same and the exterior. The flow of air through the main outlet chamber 10 into the nozzle chamber 40 does not stop until the plate 28 and the pistons 26 and 27 have been fully restored to their normal positions. The continuance of the flow of air through the nozzle after the pressure within the receptacle is relieved is important because it serves to clean the nozzle after the pressure upon the surface of the liquid is relieved.

I claim as my invention:

1. In a device of the character described, the combination with a closed receptacle, and a member having an inlet chamber, main and auxiliary outlet chambers, passages respectively connecting the inlet and auxiliary outlet chambers with the main outlet chamber, and passages between the auxiliary outlet chamber and the interior of the receptacle and between the auxiliary outlet chamber and the exterior, of normally closed manually operable valves for governing communication between the inlet and main outlet chambers and between the main and

auxiliary outlet chambers, means for cutting off communication of the auxiliary outlet chamber with the exterior, and a nozzle having outlet passages that communicate respectively with the interior of the receptacle and with the main outlet chamber.

2. In a device of the character described, the combination with a closed receptacle, and a member having an inlet chamber, main and auxiliary outlet chambers, the inlet and auxiliary outlet chambers being of larger size at one end than at the other end, passages respectively connecting the smaller ends of the inlet and auxiliary outlet chambers with the main outlet chamber, and passages between the auxiliary outlet chamber and the interior of the receptacle and between the auxiliary outlet chamber and the exterior, of connected pistons operating in the smaller ends of the inlet and auxiliary outlet chambers and governing communication of the said passages with the larger ends of the said chambers, and a nozzle having outlet passages that communicate respectively with the interior of the receptacle and with the main outlet chamber.

3. In a device of the character described, the combination with a closed receptacle, and a member having an inlet chamber, main and auxiliary outlet chambers, the inlet and auxiliary outlet chambers being of larger size at one end than at the other end, passages respectively connecting the smaller ends of the inlet and auxiliary outlet chambers with the main outlet chamber, and passages between the auxiliary outlet chamber and the interior of the receptacle and between the auxiliary outlet chamber and the exterior, of connected pistons operating in the smaller ends of the inlet and auxiliary outlet chambers and governing communication of the said passages with the larger ends of the said chambers, means independent of said pistons for regulating the degree of communication between the main and auxiliary outlet chambers, and a nozzle having outlet passages that communicate respectively with the interior of the receptacle and with the main outlet chamber.

4. In a device of the character described, the combination with a closed receptacle, and a member having an inlet chamber, main and auxiliary outlet chambers, the inlet and auxiliary outlet chambers being of larger size at one end than at the other end, passages respectively connecting the smaller ends of the inlet and auxiliary outlet chambers with the main outlet chamber, and passages between the auxiliary outlet chamber and the interior of the receptacle and between the auxiliary outlet chamber and the exterior, of connected pistons operating in the smaller ends of the inlet and auxiliary out-

let chambers and governing communication of the said passages with the larger ends of the said chambers and also governing communication of the auxiliary outlet chamber with the exterior, and a nozzle having outlet passages that communicate respectively with the interior of the receptacle and with the main outlet chamber.

5. In a device of the character described, the combination with a closed receptacle, and a member having an inlet chamber, main and auxiliary outlet chambers, the inlet and auxiliary outlet chambers being of larger size at one end than at the other end, passages respectively connecting the smaller ends of the inlet and auxiliary outlet chambers with the main outlet chamber, and passages between the auxiliary outlet chamber and the interior of the receptacle and between the auxiliary outlet chamber and the exterior, of connected pistons operating in the smaller ends of the inlet and auxiliary outlet chambers and governing communication of the said passages with the larger ends of the said chambers, a ball valve actuated by the piston in the inlet chamber, and an inlet pipe opening into the larger end of the inlet chamber, and a nozzle having outlet passages that communicate respectively with the interior of the receptacle and with the main outlet chamber.

6. In a device of the character described, the combination with a closed receptacle, and a member having an inlet chamber, main and auxiliary outlet chambers, the inlet and auxiliary outlet chambers being of larger size at one end than at the other end, passages respectively connecting the smaller ends of the inlet and auxiliary outlet chambers with the main outlet chamber, and passages between the auxiliary outlet chamber and the interior of the receptacle and between the auxiliary outlet chamber and the exterior, of connected pistons operating in the smaller ends of the inlet and auxiliary outlet chambers and governing communication of the said passages with the larger ends of the said chambers, a ball valve carried at the inner end of the piston in the auxiliary outlet chamber for closing the passage connecting the said chamber with the exterior, and a nozzle having outlet passages that communicate respectively with the interior of the receptacle and with the main outlet chamber.

In testimony whereof, I have hereunto subscribed my name this 18th day of Oct., 1909.

GUSTAVE A. URBACH.

Witnesses:

OTTO S. SCHAIRER,
B. B. HINES.