(No Model.)

R. LOCKWOOD.

ATOMIZER VALVE.

No. 557,589. Patented Apr. 7, 1896.

Fig: 1.

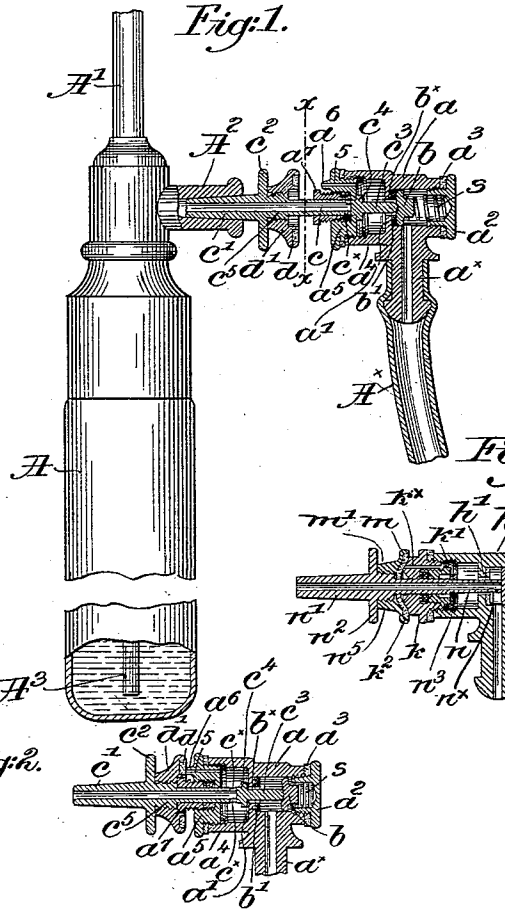


Fig: 5.

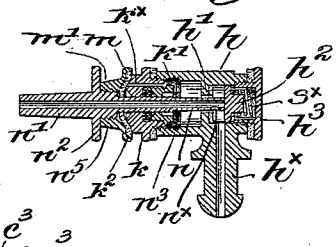


Fig: 2.

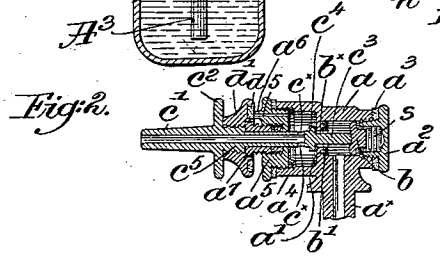
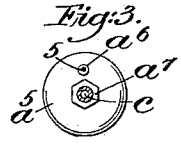


Fig: 4.

Fig: 3.



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RHODES LOCKWOOD, OF BOSTON, MASSACHUSETTS.

ATOMIZER-VALVE.

SPECIFICATION forming part of Letters Patent No. 557,589, dated April 7, 1896.

Application filed April 1, 1895. Serial No. 543,937. (No model.)

To all whom it may concern:

Be it known that I, RHODES LOCKWOOD, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Atomizer-Valves, of which the following description, in connection with the accompanying drawings, is a specification, like letters and numerals on the drawings representing like parts.

In the use of atomizers in which air contained in a suitable reservoir under pressure is employed the air is controlled by valve mechanism usually interposed between the socket of the atomizer and the pipe connected with the air-reservoir. The valve is operated by a lever or handle exteriorly mounted on the casing, one such form of valve mechanism being shown in United States Patent No. 453,650, granted to me June 9, 1891. In such constructions, however, the operating-lever is apt to be bent or displaced, interfering with the operation of the device, and the stem secured in the casing works loose with handling, no matter how tightly it may have been secured in the first instance.

This invention has for its object the production of a simple and effective valve mechanism for atomizers or other instruments which shall be free from the foregoing objections, and permitting rotative movement of the atomizer relative to the valve-casing without disarrangement of the parts.

Figure 1 shows a sufficient portion of an atomizer or "spray" to be understood, with one form of my improved valve mechanism added, and shown in section, the valve being closed. Fig. 2 is a sectional view of the valve mechanism, showing the valve open; and Figs. 3 and 4 are views looking to the right and left hand, respectively, of the section-line $x\ x$, Fig. 1. Fig. 5 is a longitudinal sectional view of a modified form of valve mechanism to be described.

The atomizer or spray, composed of a liquid-holding bottle A, pipe A′, to which a spray-nozzle (not shown) is attached, and the socket A^2, are and may be all as common in atomizers using air forced through a pipe to atomize the liquid drawn into the pipe A^3. A pipe $A^\times$, preferably of india-rubber, is connected at one end with a reservoir (not shown) containing compressed air, the other end of the pipe being connected by a nipple $a^\times$ with a valve-casing a, having a seat a' for a valve b, kept normally seated, as shown in Fig. 1, by a spring s between the valve and a suitably-shaped cap a^2 screwed into the end of the casing. A washer b' of rubber or other suitable material is shown as fitting against the face of the valve-seat, and a suitable gasket a^3 maintains the cap a^2 air-tight. The part a^4 of the casing is threaded to receive a stuffing-box a^5 of any desirable construction, through which is inserted the valve-actuator. This actuator is herein shown as a partially-hollow rod c, provided at one end with a stem c' to enter the socket A^2 of the atomizer, and having an annular base or flange c^2, the other end of the rod being solid, as herein shown, as at c^3. The actuator is preferably long enough to pass through the valve-opening $b^\times$ and rest against the valve b when seated, the valve being slightly concaved in its face, if desired. Lateral openings $c^\times$ in the hollow portion of the rod establish communication with the interior of the casing when the parts are in the position shown in Fig. 2 and the valve b unseated, so that air may rush through the pipe $A^\times$ into the casing and thence to the atomizer.

The wall of the stuffing-box a^5 has therein a vent-passage or air escape or exit 5, terminating exteriorly in a hub or boss a^6 in Fig. 3, and with which coöperates a stop or pad d, shown in Fig. 4 as a ring of leather, rubber, or other suitable material, held in the adjacent face of a nut d', preferably screwed upon a threaded portion c^5 of the rod c, and thereby adjustable upon the rod, the nut being shown as centrally recessed to receive at times the stuffing-box cap a^7, as shown in Fig. 2.

The actuator c has a stop c^4 thereon, shown as a flange adapted to bear against the inner end of the stuffing-box, controlling the outward movement of said actuator.

The parts having been assembled as in Fig. 1, and it being desired to discharge some of the contents of the bottle A through its nozzle, the operator, holding the socket A^2 between his fingers, resting against the flange

c^2, will, with his thumb on the cap a^2, press the valve-casing toward the bottle. As the actuator c is held from movement, the casing a will be moved bodily thereon, the inner end of said actuator unseating the valve b against the action of the spring s, the valve-opening $b^\times$ and openings $c^\times$ in the hollow portion of the actuator establishing communication between the pipe $A^\times$ and the atomizer, as shown in Fig. 2. At the same time the boss a^6 is brought against the pad d, closing the vent-passage 2, to prevent the passage of air. When the discharge of liquid is to be stopped, the operator releases the cap a^2 from pressure, and the spring s instantly forces the casing into its normal position, (shown in Fig. 1,) seating the valve b, the pad d at the same time uncovering the vent or escape passage 5, so that all forcing pressure tending to spray or discharge the liquid ceases instantly as the valve is seated.

In the use of an atomizer the patient is very apt to throw back the head as the spray touches the affected parts, and did not the spray cease, by the opening of the escape or vent passage it would be discharged upon the patient's face.

The casing is freely rotatable upon the actuator-rod c, so that relative rotative movement of the bottle A and the casing a will produce no harmful effect, and, owing to the annular shape of the pad or stop d, it will always coöperate with the vent-passage 5.

It is frequently necessary to attach the stem to the liquid-holding bottle or atomizer by a bayonet or other similar joint, and unless this is very accurately adjusted, in the construction shown in my patent referred to, the actuating-lever will not move in a vertical plane and becomes bent and operates improperly, but with the construction shown herein the actuator and casing may be moved rotatively without deranging the parts or their relative position, and when the stem is attached to the atomizer the valve-casing may be rotated into any desired position.

In the modification shown in Fig. 5 the valve-casing h, nipple $h^\times$, valve-seat h', valve h^2, cap h^3, and spring $s^\times$, are substantially of the construction of like parts shown in Figs. 1 and 2; but the stuffing-box k, screwed into the valve-casing h, is recessed at its inner end to receive the cap k', the outer end of the stuffing-box being shown as convex at k^2, and a vent-passage $k^\times$, or air escape or exit, is made in the wall of the box, the outer end of said passage being at times closed by an annular stop or pad m, of leather, rubber, or other material, held in the adjacent concave face of a nut m'.

The convex end of the stuffing-box fits into the concave washer m when the valve h^2 is moved from its seat, as shown in Fig. 5, and thus closes the vent-passage $k^\times$, no matter what be the relative rotative position of the valve-casing and nut m'. The actuator n, having an annular flange n^2 and stem n', receives the nut m' upon a threaded portion n^5, and in the modification the actuator is hollow or tubular throughout its length, the inner end resting against and actuating the valve h^2 against the force of the spring $s^\times$. An opening $n^\times$ in the actuator establishes communication between the valve-casing and the actuator, and a collar n^3 is shown on the actuator to enter the recessed head of the stuffing-box cap when the valve is seated to prevent withdrawal of the actuator from the valve-casing and stuffing-box.

In Fig. 5 the valve is shown as unseated and the vent-passage closed, corresponding to the position of the parts shown in Fig. 2.

By making the vent-passage terminate exteriorly in the surface k^2 of the stuffing-box end the wear on the stop or pad m is decreased and there is no possibility of catching of the parts.

I claim—

1. A valve mechanism for atomizers and other apparatus, comprising a casing containing a valve-seat and an air-escape passage, a valve-stem, a valve arranged in said casing and coöperating with the seat therein, and a closure for the escape-passage arranged upon the valve-stem, substantially as described.

2. A valve mechanism for atomizers and other apparatus comprising a casing containing a valve-seat and an air-vent arranged eccentrically in such casing, a valve-stem upon which the casing is mounted and is capable of movement lengthwise thereof and about which also it may be rotated, a valve on said stem coöperating with the valve-seat, and a vent-closing device also mounted upon the said valve-stem, substantially as described.

3. A valve mechanism for atomizers and other apparatus, comprising a valve-casing, a valve therein, means normally to seat such valve in said casing, an air-escape passage or air-vent in the egress end of the casing, and a valve-actuator consisting of a stem upon which the casing is mounted, and also upon which stem the casing has the capacity of movement lengthwise of the stem in order to unseat the valve, and a vent-closing device mounted upon the stem and operated by the movement of the casing, substantially as described.

4. A valve mechanism for atomizers and other apparatus, comprising a valve-casing, a valve therein, means normally to seat such valve in said casing, an air-escape passage or air-vent in the egress end of the casing and a valve-actuator consisting of a stem upon which the casing is mounted, the said casing having the capacity of movement lengthwise of the stem in order to unseat the valve, the said stem being made tubular, and a vent-controlling device mounted upon the stem and rendered operative by the movement of the casing, substantially as described.

5. In a valve mechanism for atomizers and other instruments or apparatus, a casing, a valve proper fitted therein, a valve-stem, and

an air-escape passage in the casing, the said casing being movable upon the valve-stem to effect the opening and closing of the valve, the air-escape passage being simultaneously closed and opened respectively, substantially as described.

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

RHODES LOCKWOOD.

Witnesses:
JOHN C. EDWARDS,
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