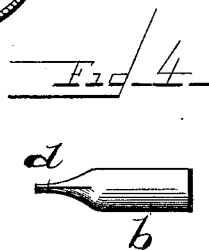
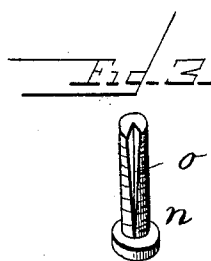
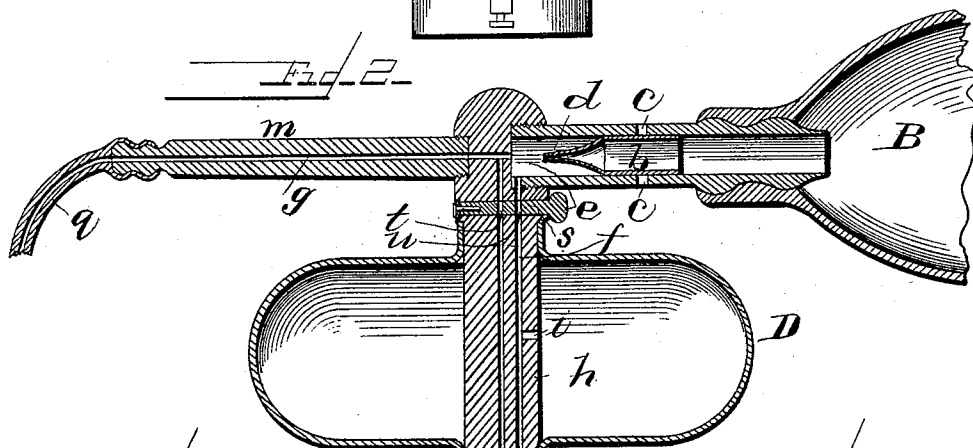
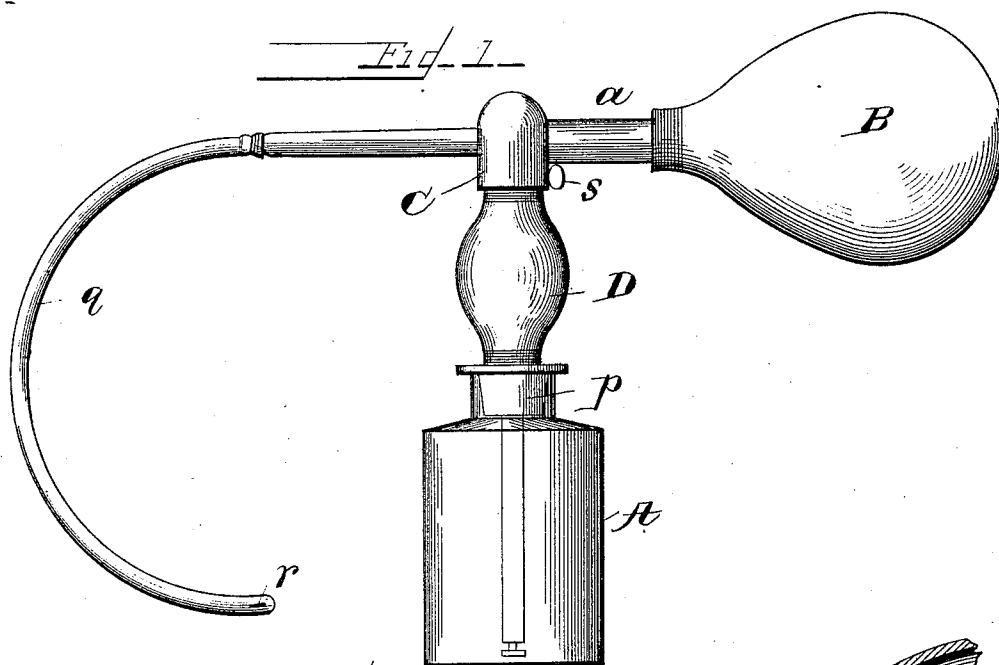


(No Model.)

E. T. BATES.
ATOMIZER.

No. 460,458.

Patented Sept. 29, 1891.



Witnesses

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UNITED STATES PATENT OFFICE.

EDWARD T. BATES, OF WASHINGTON, DISTRICT OF COLUMBIA.

ATOMIZER.

SPECIFICATION forming part of Letters Patent No. 460,458, dated September 29, 1891.

Application filed June 15, 1891. Serial No. 396,237. (No model.)

To all whom it may concern:

Be it known that I, EDWARD T. BATES, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Atomizers; 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.

My present invention relates to atomizers, and has for its object certain improvements in construction, which will be hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, which form part of this specification, Figure 1 represents a side elevation; Fig. 2, a vertical section on an enlarged scale with the air-pressure regulator expanded; Fig. 3, a detail perspective of the valve for controlling the supply of liquid, and Fig. 4 a side elevation of the flexible air-supply valve.

Reference being had to the drawings and the letters thereon, A indicates a liquid-receptacle which may be of any approved form; B, a flexible bulb for supplying air under pressure; C, a T-shaped conductor for air and liquid, to the horizontal arm *a* of which the bulb B or any suitable air-supplying device is attached. The arm *a* is tubular, and within it is placed a tubular flexible and collapsible valve *b*, which is contracted at its front end *d* and controls the ingress of air to the bulb B through ports *c c* in the arm *a*, and its egress through its contracted front end *d*, from which the air is discharged into the receiving and distributing chamber *e*. With the chamber *e* communicate two conduits or passages *f g*, the former extending through the vertical branch *h* of the conductor C to supply air to the surface of the liquid in the receptacle A, and the pressure thereof is regulated by a flexible regulator D, which is supplied through a port *i*, which communicates with the passage *f*. The regulator D is secured to the branch *h* by wrapping with cord or in any other suitable manner. From the branch *h* extends a tube *k*, through which and the branch *h* extends a liquid-supply passage *l*, which at its upper end communicates

with the passage *g*, which extends through the other horizontal arm *m* of the conductor C. In the lower end of the tube *k* is inserted a valve *n* for controlling the supply of liquid to be atomized, and in the body of the valve is a graduated groove or passage *o* for regulating the supply of liquids, according to the air-pressure applied or the density of the liquids, the light liquids under low pressure being supplied through the small portion of the passage and the heavy liquid under low pressure through the large portion of the passage, or the heavy liquid may be supplied through the small portion of the passage under a higher degree of pressure. The branch *h* fits a cork *p* in the neck of the liquid-receptacle or may be provided with any suitable packing.

In the vertical branch *h* of the conductor C is a stop-cock *s* provided with ports *t u*, which register with the passages *g* and *l* when the atomizer is in use and cuts off the egress of liquid from the receptacle A and prevents waste while being carried in a case or on the person.

To the outer end of the arm *m* is attached a flexible soft discharge-tube *q*, of soft rubber or other suitable soft material, which is provided with any suitable number of egress-passages, as *r*, for atomizing and spraying liquid. This tube being of flexible soft material throughout its entire length is especially adapted for insertion into the nasal passages, the throat, or the ear, and may be bent and twisted to follow the passage without danger of injuring delicate organs, which frequently attends the insertion of a conductor having a metallic or hard-rubber tip. The flexibility of the conductor also admits of its being revolved while in a passage to direct spray or mist against any part of the passage.

The conductor C may be made of hard rubber or metal in sections connected by screw-threads, or it may be molded or cast and the passages drilled.

Air being forced into the chamber *e* is distributed, a portion flowing down the passage *f* and a portion flowing through the passage *g*, where it meets the liquid rising through the passages *l* and forces it through the arm *m* into the flexible discharge tube or con-

ductor *g*, from which it is emitted in the form of atomized spray or mist.

By the relative positions of the inner end of the valve *b*, the chamber *e*, and the passages *g* and *l* the air passing through *g* operates to raise the liquid *l* on the principle of operation attending an ejector, and by conducting the air which enters the passage *f* into the flexible pressure-regulator *D* and then into the receptacle *A* the flow of liquid is regular and the atomized spray continuous and uninterrupted.

Having thus fully described my invention, what I claim is—

1. An atomizer having a suitable air-supplying device, in combination with a supplemental flexible air reservoir and regulator surrounding and communicating with the air-passage of the tube communicating with the liquid-receptacle.

2. An atomizer having a suitable air-supplying device and a conductor provided with an air and a liquid passage controlled by a stop-cock, in combination with a supplemental flexible air reservoir and regulator surrounding and communicating with the air-passage of the tube communicating with the

liquid-receptacle between said stop-cock and said receptacle.

3. The combination of a liquid-receptacle, an air-supplying device, a conductor provided with air and liquid supply passages communicating with the air-supplying device and the liquid-receptacle, and a soft, flexible, and elastic tube having a soft, flexible, and elastic discharge end and an egress-passage for emitting atomized spray.

4. The combination of an air-supplying device, a flexible tubular valve normally open at one end and closed at the other end, air-supply passages in the conductor around said valve, an air-distributing chamber within the conductor having a vertical passage communicating with the liquid-receptacle, and a separate horizontal passage crossing the vertical liquid-supply passage in the head-piece of the conductor at a right angle.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD T. BATES.

Witnesses:

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