

T. A. DE VILBISS.  
SPRAY HEAD FOR ATOMIZERS.  
APPLICATION FILED MAY 2, 1908.

905,296.

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Fig. 1.

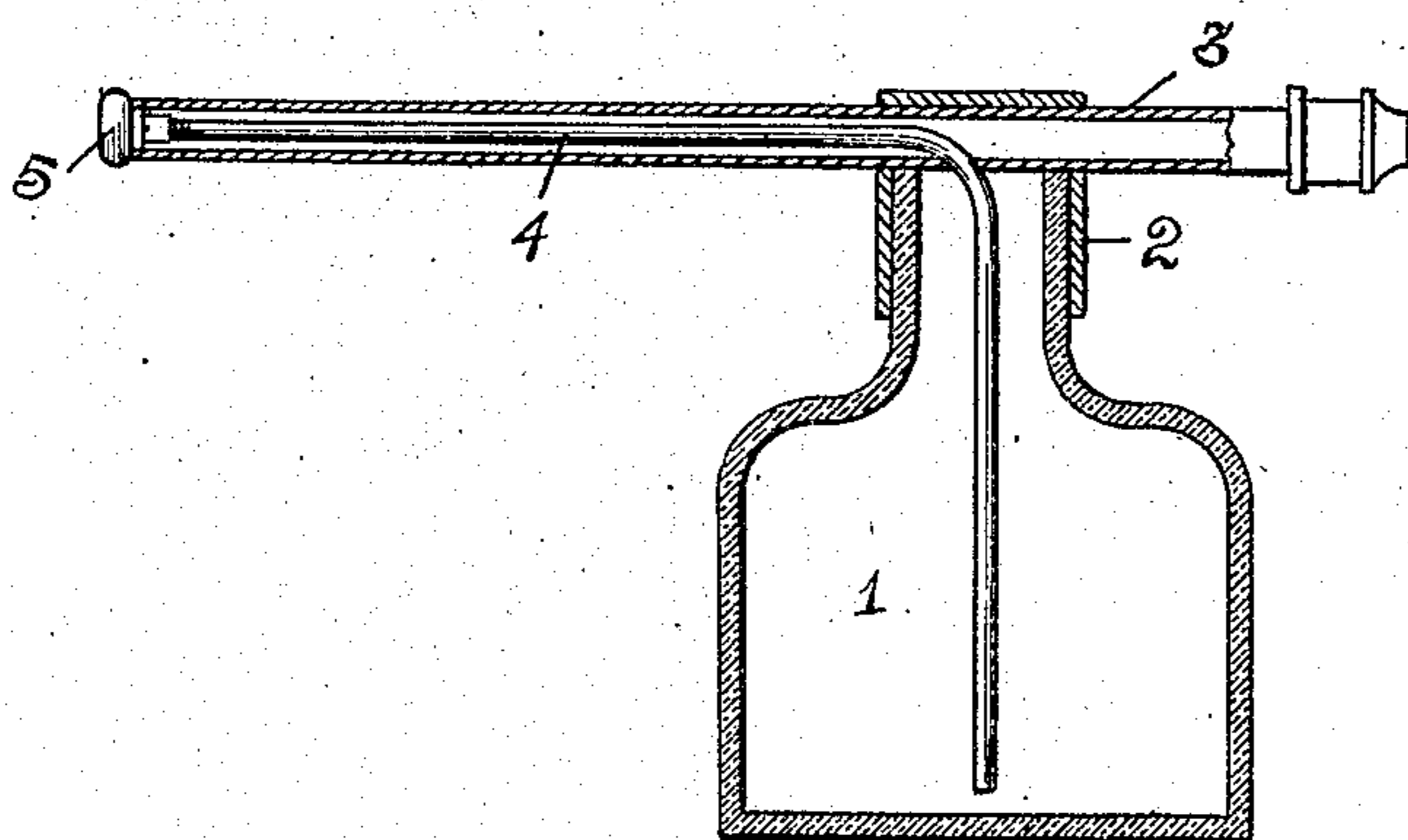
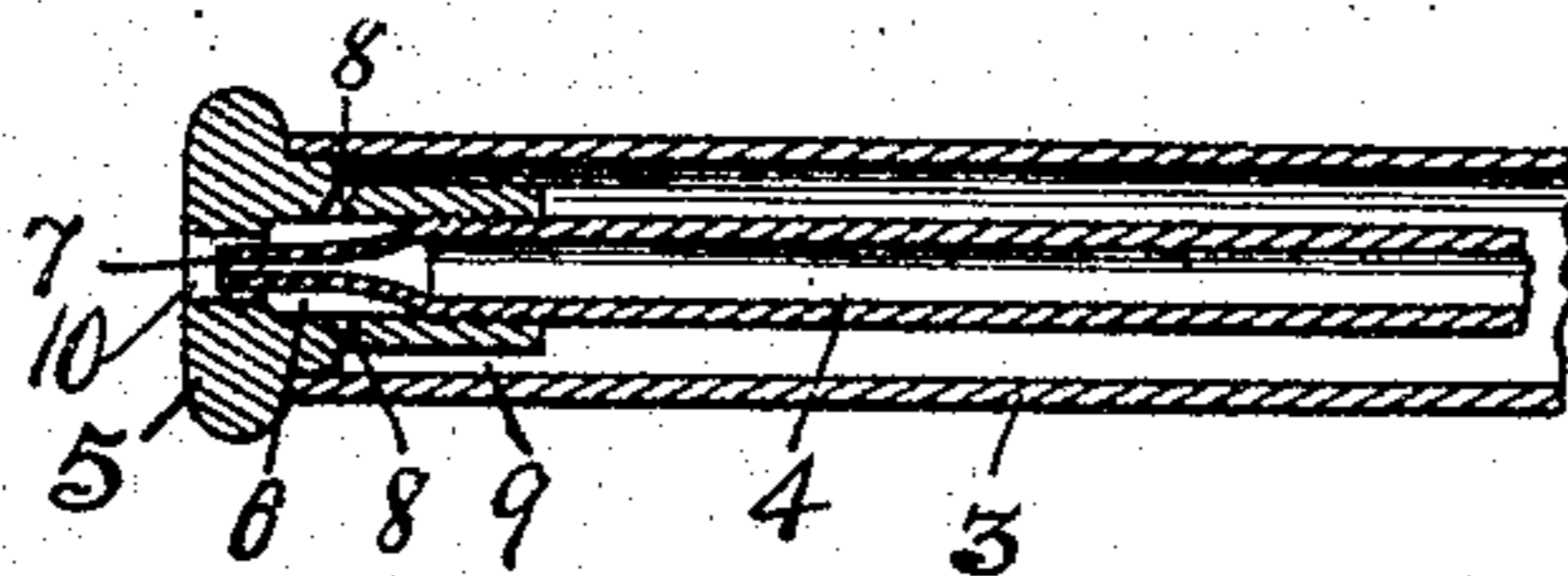


Fig. 2.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## SPRAY-HEAD FOR ATOMIZERS.

No. 905,296.

Specification of Letters Patent.

Patented Dec. 1, 1908.

Application filed May 2, 1908. Serial No. 430,444.

*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 Spray-Head for 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, 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 atomizers of the "vacuum" type wherein the liquid to be sprayed is drawn from its receptacle through a suitable conduit and discharged therefrom through a spraying-head or nozzle in spray form by the action of a stream of air which is made to rush rapidly through said head past the discharge end of said conduit.

The object of my invention is to improve upon spraying-heads of this class whereby the air blast is caused to operate on the discharge end of the liquid-tube in such manner as to effect a stronger and more efficient and voluminous spray than is possible with the forms of spraying-heads now in use.

The invention is fully described in the following specification and illustrated in the accompanying drawings, in which,—

Figure 1 is a central vertical section of an atomizer bottle and its tubes embodying my invention, and Fig. 2 is an enlarged central longitudinal section of the discharge ends of the air and liquid tubes and associated spraying-head.

Referring to the drawings, 1 designates any suitable form of liquid-bottle or receptacle, to the neck of which is secured a cap or other closure member 2, which carries the air-tube 3 and the liquid-tube 4 in a suitable manner. The liquid-tube 4, which is smaller in diameter than the air-tube 3, telescopes at its outer end in the discharge end of said air-tube and is maintained positively centered therein by the spray-head or plug 5. This spray-head is axially bored, as at 6, and fits closely into the end of the air-tube and onto the liquid tube slightly to the rear of its end, being preferably threaded to the latter to draw the head closely to its seat within the outer tube when turned in the proper direction. The end of the liquid-tube

which projects within the bore 6 of the head is reduced in advance of its point of coaction with said tube to form the restricted discharge-nozzle 7, as shown, thus providing an annular space between it and the wall of the spraying-head throat or bore. This annular space is in communication with the air-tube through a plurality of openings 8 in the wall of the plug or head and the space or spaces 9 provided around the inner end portion thereof by annularly reducing the same or in any other manner.

The outer end of the bore or throat of the spray-head is restricted or contracted, as at 10, and the end of the nozzle 7 projects within this restriction free from contact with its wall and short of the outer end of the bore, as shown. This feature of my invention is of very great importance to the practical and efficient operation of an atomizer of the vacuum type, as the mouth of the chamber formed by the throat of the spray-head around the nozzle end of the inner-tube is thereby restricted, thus causing the air which is ejected to said throat through the openings 8 to thoroughly envelop the nozzle and be discharged in a perfect cylindrical stream around the nozzle end with greater force and effectiveness than would be the case if the air had a free and unrestricted exhaust from the spray-head chamber.

It is absolutely necessary to the perfect operation of an atomizer of the vacuum type that the nozzle end of the inner tube terminate within the restriction 10 and not short thereof or within the chamber or enlarged portion 6 of the spray-head bore, as in the latter case the reaction and deflection of the exhausting air occasioned by its striking the annular shoulder formed by the restriction will cause a back pressure instead of a suction through the liquid-tube, which back-pressure is noticed by air bubbles rising from the liquid in the bottle at the inner end of the liquid-tube. It is also essential to an efficient operation of the spray-head that the nozzle end terminate short of the outer end of the restricted portion of the bore, as otherwise the expansion of the air as it leaves the end of the discharge-throat of the head would cause it to lose its effectiveness on the nozzle end.

In use, the air in the tube 3 flows under pressure through the opening 8 and into the

chamber 6 around the nozzle 7. The compressing of the air within such chamber due to the contracting of the mouth thereof around the nozzle 7 causes the air to be  
5 equally distributed around the nozzle and then discharged in increased force from the chamber through the restricted annular space around the end of the nozzle, thus creating a suction at the nozzle end and  
10 inducing a flow of liquid therefrom which mingles with the air and is discharged in the form of spray or vapor from the spray-head.

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

1. In a vacuum atomizer, the combination with an outer air-tube, and an inner liquid-tube having a contracted nozzle at the end,  
20 of a spray-head fitted into the end of the outer tube and onto the inner tube to the rear of the nozzle and having a bore which is contracted at its outer end and communi-

cates with the outer tube, said nozzle being spaced from the bore to provide an air- 25 chamber therearound and having its end terminating within the contracted portion thereof and short of its outer end.

2. In a vacuum atomizer, the combination with an outer air-tube, and an inner liquid- 30 tube having a contracted nozzle at the end, of a head fitted into the outer and onto the inner tube, whereby to relatively center the same, and having a bore which is contracted at its outer end and communicates with the 35 outer tube, said nozzle being spaced from the bore and having its end terminating within said contracted portion short of the outer end thereof.

In testimony whereof I have hereunto 40 signed my name to this specification in the presence of two subscribing witnesses.

THOMAS A. DE VILBISS.

Witnesses:

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