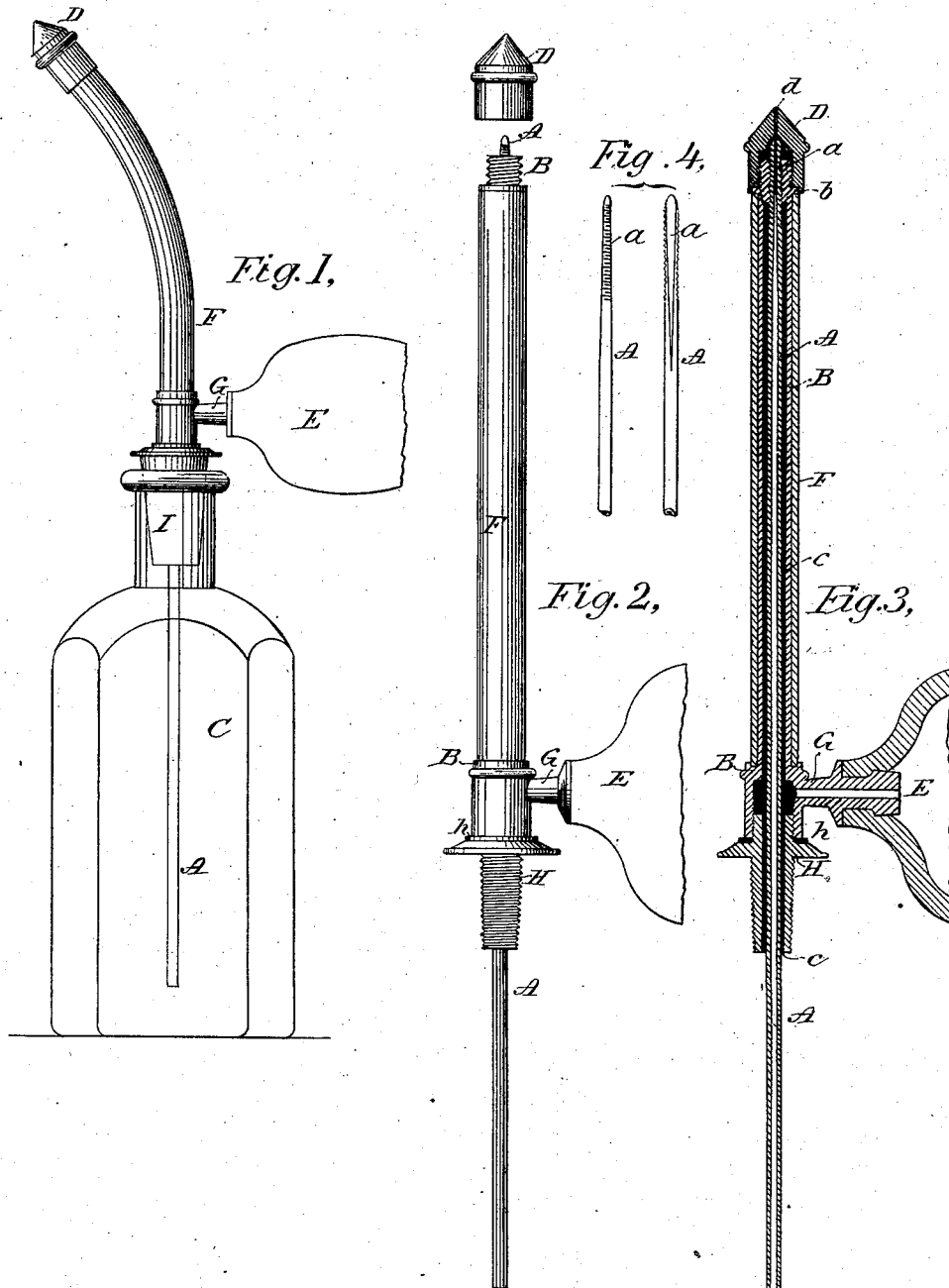


(No Model.)

T. E. STUDLEY.  
ATOMIZER.

No. 260,505.

Patented July 4, 1882.



WITNESSES

Ernest Alshagen  
Philip H. H. H.

By his Attorney

INVENTOR

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by A. Pollok  
his attorney

# UNITED STATES PATENT OFFICE.

THEODORE E. STUDLEY, OF NEW YORK, N. Y., ASSIGNOR TO THE GOODYEAR RUBBER COMPANY, OF SAME PLACE.

## ATOMIZER.

SPECIFICATION forming part of Letters Patent No. 260,505, dated July 4, 1882.

Application filed March 22, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, THEODORE E. STUDLEY, of No. 57 Maiden Lane, city, county, and State of New York, have invented a new and useful Improvement in Atomizers, which improvement is fully set forth in the following specification.

This invention relates to that class of atomizers in which two concentric flexible tubes are employed, the outer tube being provided with a cap-piece and the inner one serving for the passage of the liquid from its receptacle and terminating just within the cap-piece, where the liquid meets the compressed air from the annular space between the tubes, and whence it is forced through the perforation in the cap-piece into the atmosphere as a fine spray.

The invention has for its object to produce an efficient and durable atomizer of this description which can be readily made, is of very few pieces, readily adjustable to regulate the character of the spray, not liable to get out of order, and easily kept clean; and it consists in the manner of constructing and combining the parts—to wit, in providing the outer tube, near its end, with an internal collar, socket, or nut, made integral with or solidly attached to said tube—as by welding or soldering—and in making an adjustable connection, by screw or otherwise, between the inner tube and the said collar, socket, or nut. The fineness of the spray is regulated by shifting the position of the inner tube in the socket or nut, so that the space between its outer end and the interior of the cap-piece is diminished or enlarged, as may be required.

No attempt will be made herein to give a full or exhaustive description of the atomizers heretofore designed; but for the purpose of more clearly distinguishing the present improvement it may be observed that in an atomizer of the class hereinbefore referred to the inner flexible tube has been connected with the outer tube by means of a plug separate from the outer tube and inserted thereinto. In this apparatus the plug is not integral with or solidly attached to the outer tube, as the collar, socket, or nut in the present invention; and, moreover, the inner tube is not adjusta-

bly connected with the said plug, as it is with the collar, nut, or socket aforesaid.

Among the specific advantages due to the new construction may be mentioned the ability to make the outer tube of less diameter for a given size of interior tube and a greater facility of adjustment, besides the use of a less number of separate parts.

Referring to the accompanying drawings, which form a part of this specification, Figure 1 is an elevation of an atomizing apparatus constructed in accordance with the invention and applied to a bottle or liquid-reservoir; Fig. 2, an enlarged elevation of the apparatus detached and with the cap removed; Fig. 3, a central longitudinal section, and Fig. 4 views from different sides of the upper end of the inner tube.

A is the inner and B the outer tube, both made of pure tin or other soft metal or other flexible material. The tube A, at its upper end, *a*, is screw-threaded, and screws into an internal thread formed in the end of tube B, which is contracted at that part. The extreme end of tube A extends slightly above tube B, and its lower end projects into the bottle or liquid-reservoir C, and its internal diameter decreases toward its upper end. At the point of juncture with tube B it is grooved or cut away, (see Fig. 4,) so as to form passages between the tubes.

The tip or cap D, formed of hard rubber or other suitable material, fits over the end of tube B, and is screwed tightly against a collar, *b*, formed on said tube. It is provided at its apex with a small perforation, *d*, in line with tube A.

The inner tube, A, is so much smaller than outer tube, B, as to leave an annular space, *c*, between them, which forms an air-passage leading into the interior of cap D through the passages formed by the grooves in the end of tube A, as explained. This air-passage *c* communicates with the interior of the air-forcing bulb E through the branch tube G, formed in one piece with tube B.

As explained, the tube A extends into the interior of cap D, and it will be seen that by turning said tube so as to bring it nearer to

or farther from the cap or tip the air-passage will be made smaller or larger and a finer or coarser spray produced.

For the purposes of ornamentation or protection the tube is surrounded by a flexible rubber tube, F.

As shown, the lower end of tube B is threaded and screwed over the stopper-piece H, which is hollow to admit the passage of tube A. A washer, *h*, is inserted between tube B and stopper-piece H, to insure a tight joint. The stopper-piece is also threaded at its lower end and screws into a stopper, I, which is inserted in the neck of the bottle or liquid reservoir C.

The concentric tubes A B, being of soft metal or other flexible material, may be bent, as in Fig. 1, so that the spray can be thrown in any desired direction.

Should the instrument get out of order by reason of the tubes being stopped up or debris collecting in any part, it is only necessary to straighten out the tubes, when the whole can be taken apart by unscrewing tube B from stopper-piece H and tube A from tube B, and taking off the cap or tip D. The parts are as easily put together again.

Modifications may be made in the details of construction without departing from the spirit of the invention—as, for example, the tubes A B could be connected by a friction-joint or other suitable connection, instead of in the manner shown.

Having now fully described my said invention and the manner of carrying the same into effect, what I claim is—

The improved flexible-tube atomizer described, comprising, in combination, the outer tube having the internal socket or nut made integral with or solidly attached to said tube, so as practically to form part thereof, the inner tube passing through said socket or nut and connected therewith by a screw or other adjustable joint, and the cap-piece secured to the outer tube over the end of the inner tube, as set forth.

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

THEO. E. STUDLEY.

Witnesses:

C. W. TOWN,

CHAS. A. TALLMAN.