

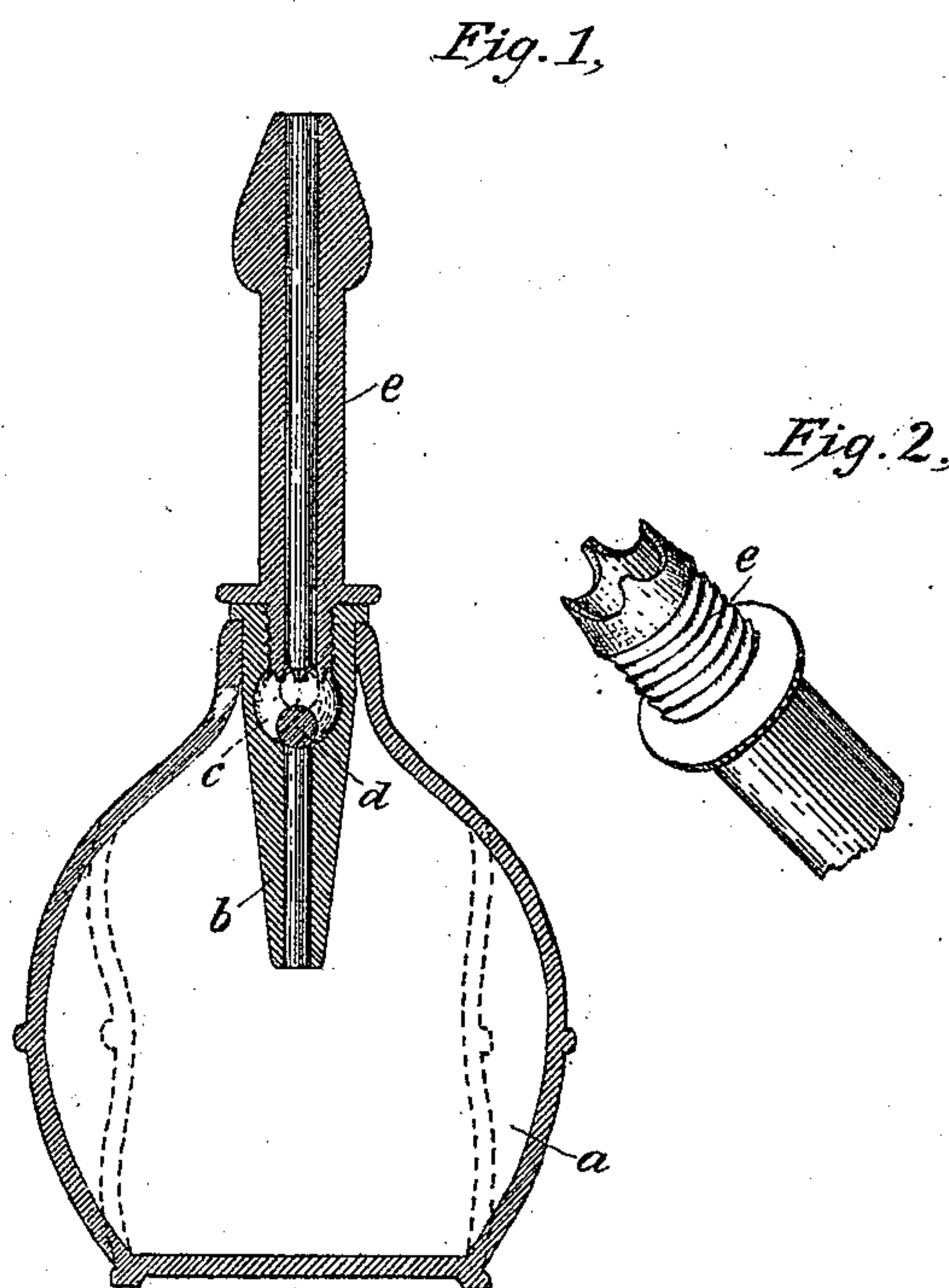
(No Model.)

D. H. GOODWILLIE.

POWDER INSUFFLATOR.

No. 355,816.

Patented Jan. 11, 1887.



Witnesses

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UNITED STATES PATENT OFFICE.

DAVID H. GOODWILLIE, OF NEW YORK, N. Y.

POWDER-INSUFFLATOR.

SPECIFICATION forming part of Letters Patent No. 355,816, dated January 11, 1887.

Application filed August 13, 1886. Serial No. 210,793. (No model.)

To all whom it may concern:

Be it known that I, DAVID H. GOODWILLIE, a resident of New York city, in the county and State of New York, have invented a new and useful Improvement in Powder-Insufflators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings and the letters and figures marked thereon, which form a part of this specification.

The object of my invention is to produce a spray or jet of impalpably divided powder by a simple and economical and convenient means, and at the same time to protect the powder when not in use from the introduction of air or any foreign matter.

My invention is shown in the accompanying drawings, in which Figure 1 is a vertical section of a device embodying my invention, and Fig. 2 is a detail view showing the construction of the inner end of the mouth-piece.

Similar letters indicate similar parts in the two figures.

a is a bulb, of rubber or of any other suitably flexible and elastic material, having an opening at one end. I prefer to flatten the bulb at the lower end, so as to give it a surface upon which to rest. In the opening of the bulb is fitted the tube *b*. This is preferably made of hard rubber, though it may be made of metal or any other suitable substance. The upper end of this tube is made a little larger than the opening in the bulb, so that when the tube is forced into the opening, as shown, it is held in place there by the compression of the elastic material of the bulb around it. The tube *b* is widened toward its upper end, and is hollowed out so as to form a cavity or recess, *c*. Above this recess there is an internal screw-thread in the tube. The tube is further provided with a shoulder at its upper end.

d is a ball, of rubber or metal, and operates as a valve in the recess *c*. It must be made of such a size as to completely close the opening in the bottom of the recess, and to fit properly into the projecting arms on the sides of the opening at the top of the recess. It must also be of sufficient weight.

e is the mouth-piece or nozzle. It is also preferably made of hard rubber, and is provided near its lower end with a shoulder adapted to rest and bear upon the shoulder

on the tube *b*. The mouth-piece *e* has a projecting portion at its lower end with an external screw-thread adapted to screw into the tube *b*. The opening at the lower end of this projecting portion is made, as shown in Fig. 2, with projecting arms or points around it. The object of these arms is to prevent the valve ball or closer *d* from entirely closing the opening in the mouth-piece, and to cause it to divide that opening into a number of small openings or channels through which the powder is forced. Any suitable number of projecting points may be made around this opening in the mouth-piece. The more numerous they are the finer will be the subdivision of the powder.

The powder is placed in the bulb *a* either by removing the tube *b* or by removing the valve ball or closer *d* and introducing it through the tube *b*. Then the bulb *a* is compressed, and the powder is thus forced up the tube *b*. The powder presses upon the valve ball or closer *d* and forces it up against the opening in the mouth-piece, where it rests snugly in the projecting arms around the opening. The powder is forced around the valve ball or closer and through the little channels between the projecting arms, and is thus finely subdivided and broken up. It is then expelled through the mouth-piece. When the instrument is no longer in use and is placed upon its flattened end, the valve ball or closer *d* drops down upon the lower opening in the recess *c* and closes that opening, thus preventing air or dust or dirt from getting into the bulb and coming into contact with the powder.

When the powder is forced up the tube *b*, it is first blown against the valve ball or closer *d*, and the curved form of that valve ball or closer serves to scatter the powder and distribute it through the recess *c*, thus aiding in the operation of subdivision. Moreover, the curved form of the valve ball or closer causes it to offer but little obstruction to the passage of the powder. The rising and falling of the valve ball or closer *d* also serves to prevent the openings in the recess from becoming clogged or choked up.

If the bulb be made to lean a little to one side, the valve ball or closer *d* will roll away from the lower opening in the recess *c*, and

thus the valve ball or closer *d* will not prevent the introduction of sufficient air into the bulb to distend it to its normal condition after the powder has been discharged.

- 5 Instead of making the opening in the lower end of the mouth-piece with projecting arms around it, this opening may be made with a smooth edge, and the valve-ball itself may be grooved or made with projecting arms, so that
10 when it is pressed up against the opening in the mouth-piece these grooves or arms will themselves form the smaller openings or channels through which the powder will pass. I prefer the form of nozzle and valve shown.

What I claim as new, and desire to secure 15 by Letters Patent, is—

A powder-insufflator consisting of the bulb *a*, the tube *b*, the recess *c*, the valve-closer *d*, and the mouth-piece *e*, with projecting arms at its inner opening, substantially as and for 20 the purposes set forth.

DAVID H. GOODWILLIE.

Witnesses:

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