

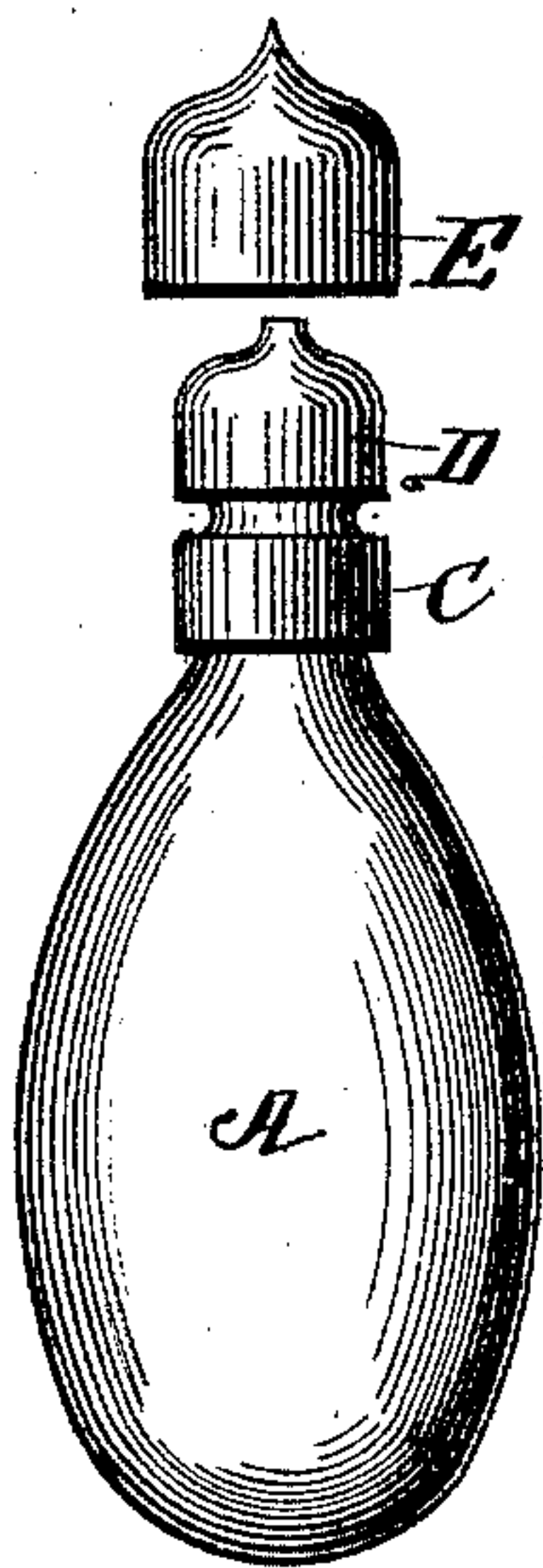
(No Model.)

A. K. IVES.  
INHALER.

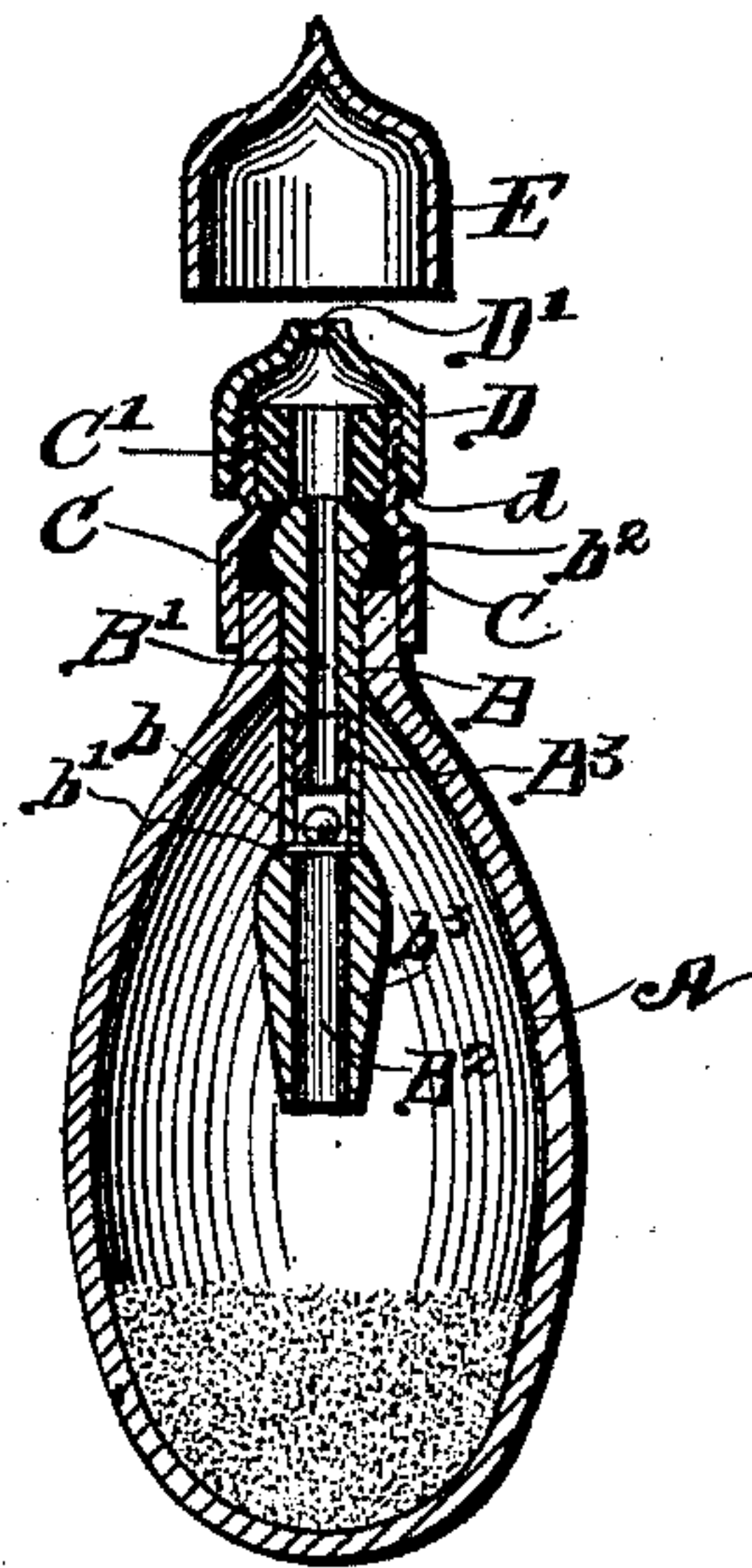
No. 464,969.

Patented Dec. 15, 1891.

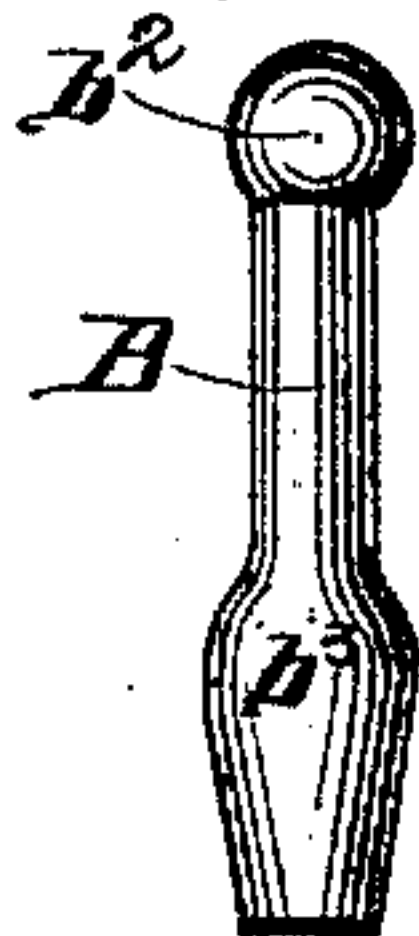
*Fig. 1*



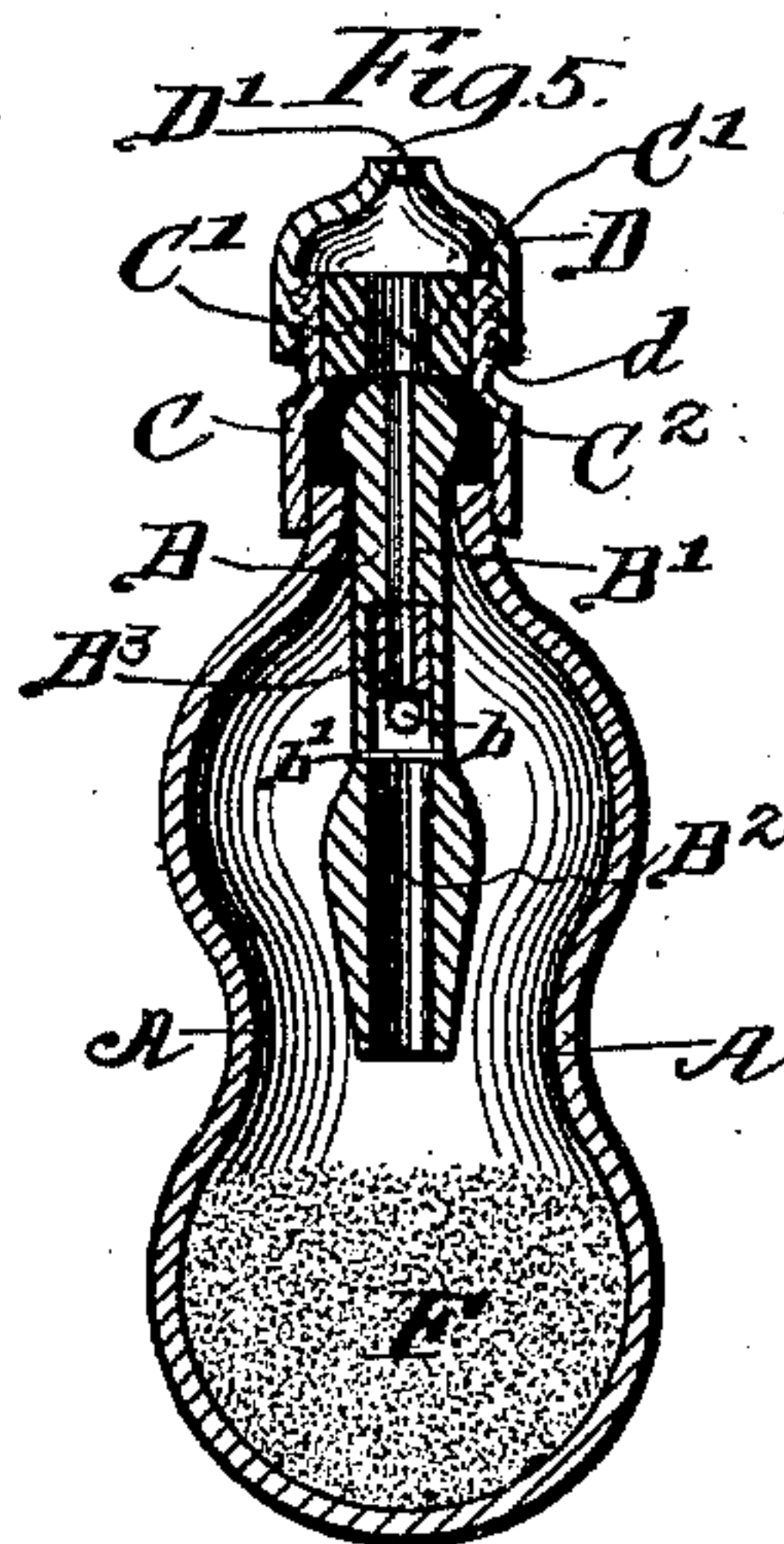
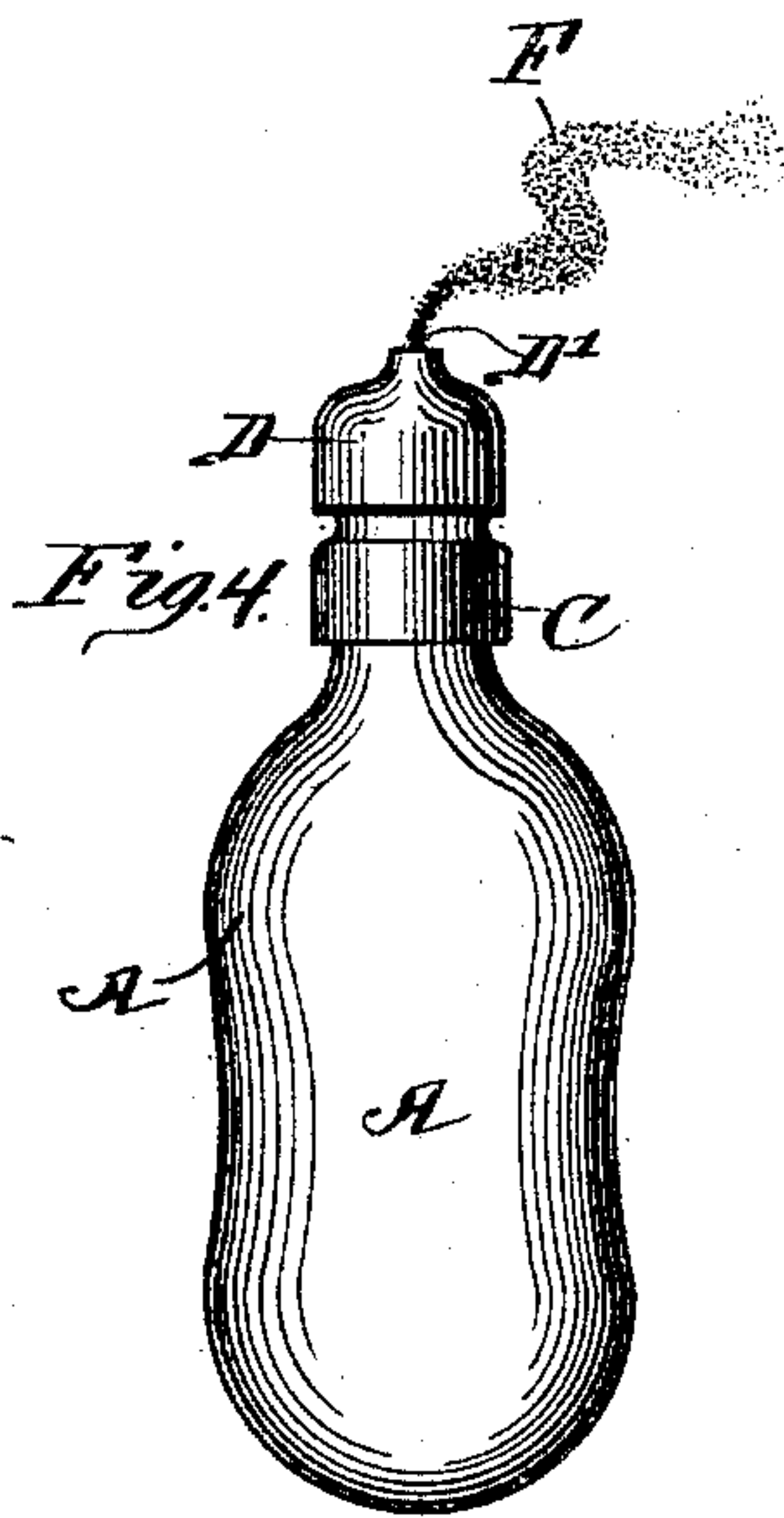
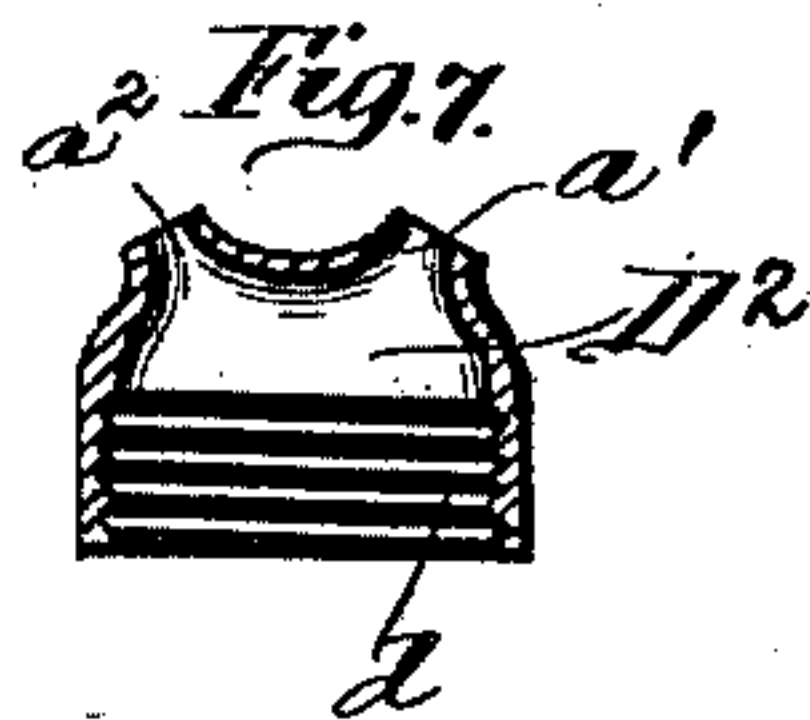
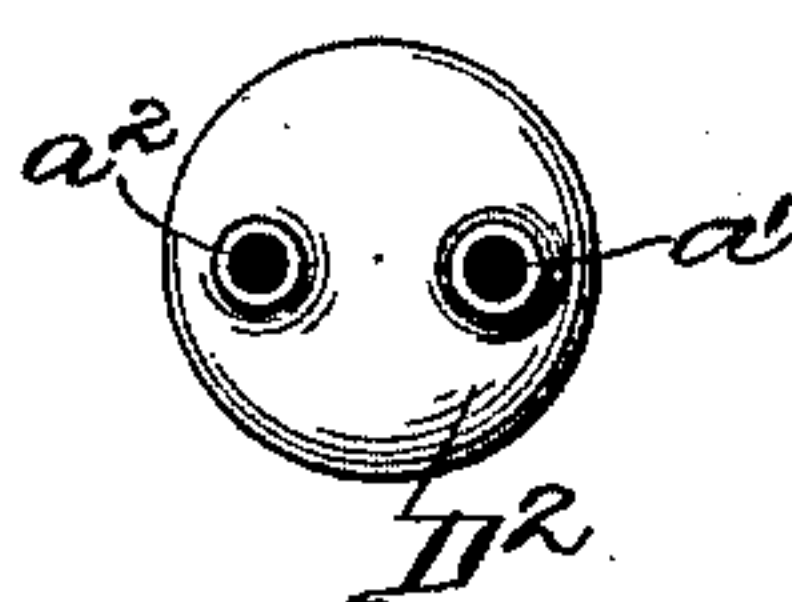
*Fig. 2*



*Fig. 3*



*Fig. 6*



Witnesses;  
Lute S. Allen;  
Tessa A. Parrish.

Inventor;  
Almon H. Ives,  
By Charles J. Brown,  
Atty.



# UNITED STATES PATENT OFFICE.

ALMON K. IVES, OF CHICAGO, ILLINOIS.

## INHALER.

SPECIFICATION forming part of Letters Patent No. 464,969, dated December 15, 1891.

Application filed July 16, 1891. Serial No. 399,676. (No model.)

*To all whom it may concern:*

Be it known that I, ALMON K. IVES, a resident of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Atomizers and Medicated-Air Inhalers, of which the following is a description.

This invention relates to that class or kind of receptacles in which a quantity of finely-powdered material can be placed and stored pending its expulsion therefrom by the person using the device.

The object of this invention is to obtain a device of the character named wherein an air-jet containing particles of such powdered material may be expelled from the receptacle, so as to carry them to and deposit them on the membranes lining the nostrils and air-ducts and passages connecting therewith in a suitable manner and in no other way, and also a device whereby the air combined with the powdered material and forming in combination with such powdered material the current expelled from the receptacle provided for holding such powdered material shall be medicated as the same is expelled therefrom.

I have illustrated my invention by the drawings accompanying and forming a part of this specification, in which—

Figure 1 is an elevation of the device with the cover (adapted to be closed over the device when not in use) removed therefrom. Fig. 2 is a cross-section of the device with the several parts in the position in which they are illustrated in Fig. 1. Fig. 3 is an elevation of the discharge pipe or nozzle of the device. Fig. 4 is an elevation of the device with the top cap removed and with the bulb thereof compressed sufficiently to expel the contents therefrom in suitable manner, the same presenting when so expelled the form of smoke. Fig. 5 is a cross-section of the device with the several parts in the position illustrated in Fig. 4. Fig. 6 is a plan view of a modification of a perforated cap forming a part of the device, and Fig. 7 is a sectional view thereof.

The same letters of reference are applied to indicate the same parts throughout the several views.

A is a bulb of rubber or other elastic material.

B is a nozzle fitting into the neck of the

bulb A. Nozzle B has the spherical head  $b^2$  at one end thereof, with stem  $b^3$  at the other end thereof and passage-way  $B'$  and  $B^2$  extending longitudinally through it. Part  $B^2$  of the passage-way is of greater diameter than part  $B'$  thereof, and  $b$  is a ball of larger diameter than part  $B'$  of the passage-way and of lesser diameter than part  $B^2$  thereof and held from dropping downward out of such part  $B^2$  of the passage-way by a pin  $b'$ .

$B^3$  is a section of rubber tubing, the inner diameter thereof being of approximately the diameter of part  $B'$  of the passage-way through the discharge-pipe on nozzle B and the outer diameter thereof being of the diameter, when inserted therein, as designed to be of part  $B^2$  of such nozzle B, and forms a seat against which the ball is forced when too rapid compression of the bulb A is attained by the person manipulating the same.

C is a hollow cap fitting over the neck of the bulb A, and  $C'$  is a ring, of felt or other porous material, fitting into cap C and having passage or way  $C^2$  extending through it.

D is a cap fitting over the cap C and having thereon screw-threads intermeshing with like screw-threads on C.

$D'$  is an aperture extending through the cap D.

E is a cap adapted to fit over the cap D, forming a cover therefor.

Before using the device finely-powdered material is placed therein to approximately the amount indicated in the drawings, Figs. 2 and 5. A suitably-liquefied medicating material is poured upon or over material  $C'$ , which may be removed from cap C for such purpose. The medicating material contained in the porous material  $C'$  may consist of an essential oil of any desired substance or of any desired substances reduced by any well-known means to a liquid form and to a form whereby when a moving body of air is brought in contact therewith or with the porous material saturated thereby a suitable amount of such liquid will be volatilized.

The operation of the device is: Upon rapid compression of the bulb A the ball is forced upward by the body of air passing outward through the passage-way of nozzle B against the seat formed by the tubing  $B^3$ , and the valve formed by such ball  $b$  and the seat thereof is



thereby closed and no further appreciable escape of the contents of the bulb will occur. If, however, the bulb A is compressed slowly, the body of mixed air and powdered material escaping through the passage-way of the nozzle B will not form a current of sufficient force to raise the ball *b*, and such current of escaping air and finely-powdered material will pass through the passage-way B' and B<sup>2</sup> of the nozzle, through the passage-way C<sup>2</sup> of the packing C', and through the perforation D' in cap, (or through the perforations *a'* and *a*<sup>2</sup> in cap D', where such cap is used,) escaping therefrom in the form of smoke. When so expelled, the instrument being held close to the nostrils of the person using the device during the act of inhalation by such person, as soon as the body of mixed air and powdered material has entered the nostrils it will pass into or through the several passages and ducts connecting with the nostrils in such manner as to deposit the medicated and powdered material upon the membrane lining such passages, allowing it there to remain. As the body of mixed air and finely-powdered material passes through the passage-way C<sup>2</sup> a sufficient amount of the medicating material contained in such material C' will be volatilized, and the body of mixed air and finely-powdered material will thereby become medicated.

It is evident that when the bulb A has been fully compressed and is allowed to resume its normal condition an ingoing current of air will extend through the passage-way formed by aperture D', passage-way C<sup>2</sup>, and B' B<sup>2</sup>, and that the body of air constituting such current will be wholly or partially medicated by the volatilizing of a portion of the material held in porous material C'. Where, as, will occasionally occur, a very strong outgoing current of mixed air and finely-powdered material and medicated in the manner described is desired, the ball *b* may be removed from the passage-way B<sup>2</sup>; but when this device is used, as I prefer to use it for injecting medicated and finely-powdered material into the nostrils, I consider it preferable to insure proper working of the device that the ball *b* be retained, although of course if the ball be absent one accustomed to the device can properly work it. By the hereinabove-described device, when

operated in [proper manner, I am enabled to obtain all essential results secured in the device heretofore patented by me on the 21st day of August, 1888, and also to obtain all the advantages secured by the devices heretofore designed for projecting a current of air suitably medicated therefrom.

Having thus described my invention and its method of operation, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A device for applying medicated powdered substances to the nasal, throat, or lung cavities, consisting of an elastic bulb, a discharge-pipe extending through the neck thereof, a cap fitting over the outer end of the discharge-pipe, porous material contained in such cap, having a passage-way extending through it, forming a continuation of the passage-way through the discharge-pipe, liquid and volatilizable material contained in the porous material, and a perforated cap fitted over the cap containing the porous material, whereby when the porous material has contained therein such liquefied matter and the bulb has therein finely-powdered material such finely-powdered material can be expelled from the bulb by compression thereof and the mixed current of air and finely-powdered material will be medicated as it extends through the passage-way therefor from the bulb, substantially as described.

2. In a device for applying powdered and medicated substances to the nasal, throat, or lung cavities, the combination of an elastic bulb, a discharge-pipe extending through the neck thereof therefrom, the lower part of such discharge-pipe being of greater diameter than the upper part thereof, a ball held in such larger portion of the discharge-pipe in the part thereof of larger diameter, a cap extending over the end of the elastic bulb and also over the end of the discharge-pipe, porous material having a passage-way through it contained in such cap, and a second and perforated cap extending over the first-named cap, adapted to retain the porous material in such first-named cap, substantially as described.

ALMON K. IVES.

Witnesses:

LUTE S. ALTER,  
CHARLES T. BROWN.