(No Model.)

G. B. SNOW.

INHALER.

No. 312,771. Patented Feb. 24, 1885.

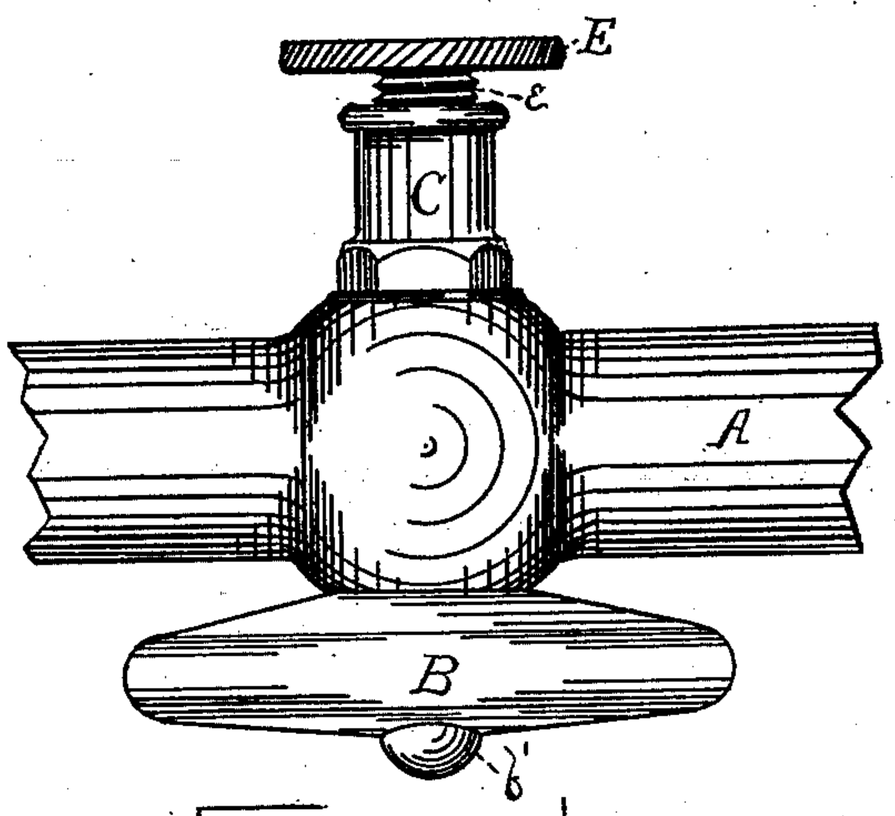

Fig. 1.

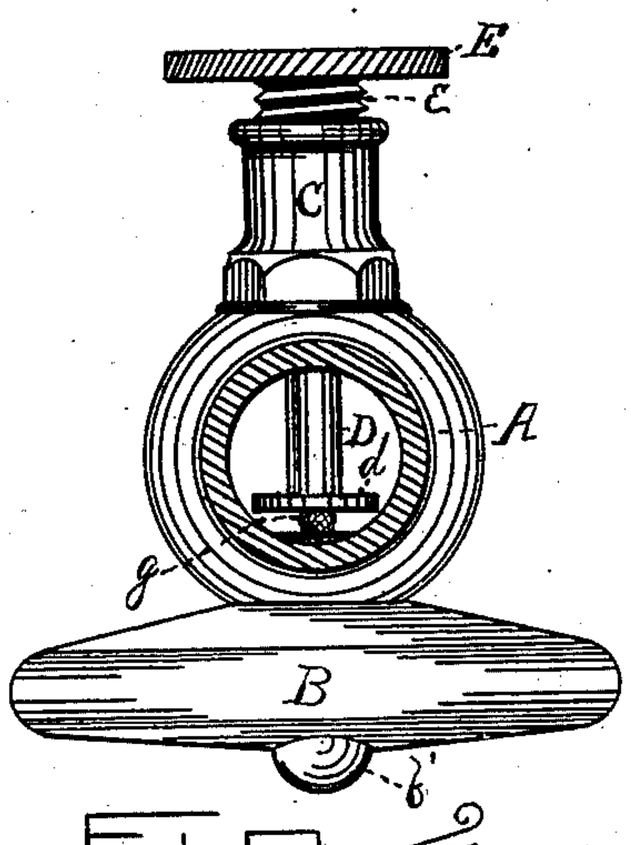

Fig. 2.

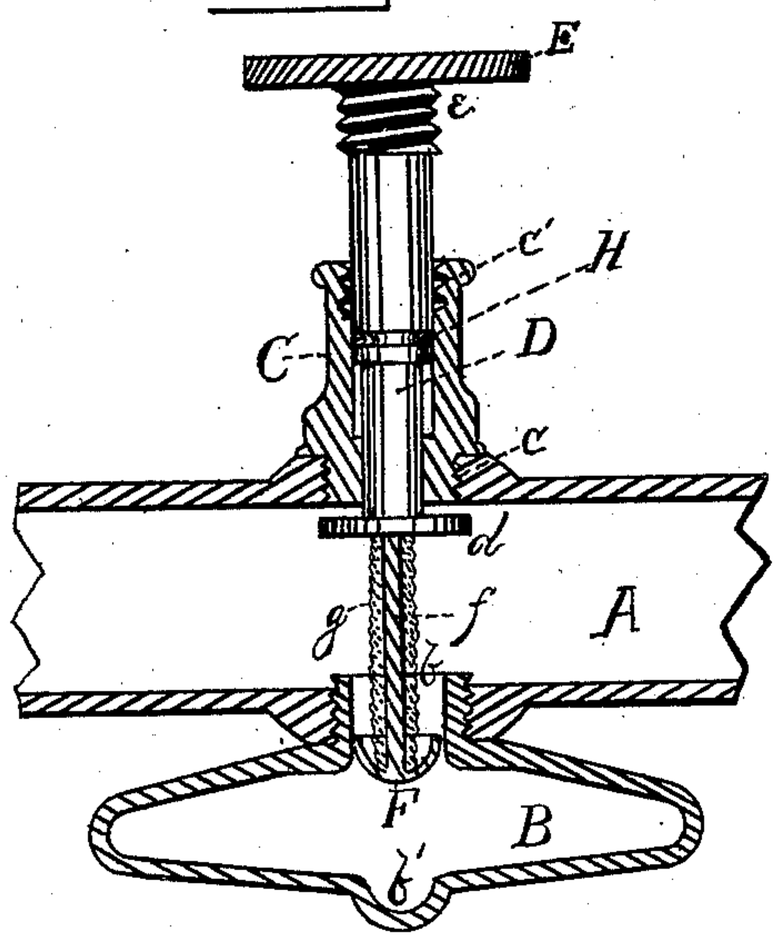

Fig. 3.

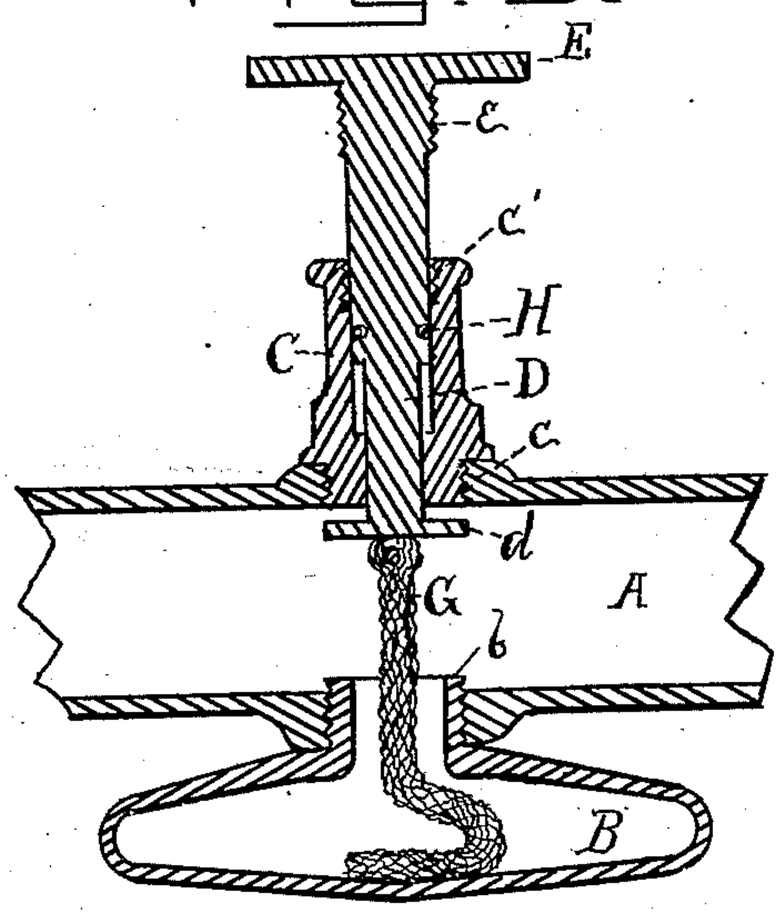

Fig. 4.

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INHALER.

SPECIFICATION forming part of Letters Patent No. 312,771, dated February 24, 1885.

Application filed December 20, 1884. (No model.)

To all whom it may concern:

Be it known that I, GEORGE B. SNOW, of the city of Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Apparatus for Compounding and Administering Anæsthetics, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figure 1 is a side elevation of a device embodying my invention. Fig. 2 is an end elevation of the same device. Fig. 3 is a sectional view thereof. Fig. 4 is another sectional view showing certain changes in the details.

This invention relates to the administration of anæsthetics, and especially to the compounding of the same when it is desired at a certain stage of the administration of one to modify its effect by the mixture with it of another.

It consists in mechanism for bringing successive portions of any fluid and volatile anæsthetic into an air-passage at pleasure, and there evaporating it for inhalation, as will be more fully hereinafter set forth.

A is an inhaling-tube through which air, a mixture thereof with the vapor of some anæsthetic fluid, or an anæsthetic gas passes.

B is a reservoir for containing any fluid and volatile anæsthetic. It is attached to the lower side of the inhaling-tube A by means of a screw-thread, *b*, and may be unscrewed and removed when it is necessary to refill it.

Directly over the point of attachment of the reservoir B, and concentric with it, a sleeve, C, is similarly attached to the tube A by the threaded portion *c*. Through the sleeve C, and having a certain amount of vertical motion therein, passes the plunger D. On the lower end of the plunger D is fastened the collar *d*.

The plunger D is operated by the handle E, immediately below which will be seen a short screw-thread, *e*, which, when the plunger D is pushed downward, will engage in the female thread *c'* in the mouth of the sleeve C. The collar *d* is packed or otherwise closely fitted to the end of the threaded portion *b* of the reservoir B, and the office of the screw *e c'* is to force the collar *d* against its seat *b* and prevent the escape of the volatile fluid contained in the reservoir B when the apparatus is not in use.

Means are provided for sustaining the plunger D at any height as it is raised, and for this purpose is shown a ring, H, inserted in an annular groove in the plunger D and bearing against the internal surface of the sleeve C.

The plunger D may be threaded throughout its entire length and operated by screwing it upward and downward, instead of by the sliding movement above described, the advantage of the sliding movement being simply greater quickness of operation.

In Fig. 4 there is shown as attached to the lower surface of the collar *d* a strand of wicking or other porous material, G, which extends into the reservoir B, resting upon its bottom. When the handle E is raised, the upper end of the wicking G will be raised into the passage A, and the fluid held therein by capillary attraction will evaporate and charge the air or gas as it passes through the tube A. As the fluid evaporates it will be constantly renewed by capillary attraction from the supply in the reservoir B. It will be seen that by properly proportioning the parts a regular and uniform supply of vapor will be furnished and incorporated with the air or gas passing through the tube A.

It is sometimes desirable to limit the quantity of anæsthetic fluid which shall be administered, so that no more than a certain quantity of one shall be used, the anæsthetic effect being mainly produced by another, which shall be simply modified in its effects by the exhibition of a small quantity of the one first mentioned. To accomplish this result, there is shown in Fig. 3 a small stud, *f*, depending from the bottom of the collar *d*, and sustaining at its lower end a cup, F, the stud *f* being enveloped by a coating, *g*, of suitable fibrous material similar in its action to the strand of wicking G, Fig. 4. The neck *b* of the reservoir B is bored, and the cup F fits it with sufficient accuracy to cut off the vapor which might arise from the contents of the reservoir B. When the handle E is depressed, the cup F is received into the depression *b'* in the bottom of the reservoir B, so that it will be filled with the fluid therein contained. When the handle E is elevated, the cup F is raised into the bore of the neck *b* of the reservoir B, cutting off any vapor arising from the contents

thereof, and the amount of anæsthetic which can be administered is limited to that which is contained in the cup F, and is held in the fibrous sheath *g* by capillary attraction. If that amount is not sufficient, a further supply can only be obtained by depressing and again elevating the handle E.

It is evident that the cup F may be made of greater or less depth, or it may be simply a disk fitting the neck *b* of the reservoir B as a piston-valve, in which case the amount of anæsthetic fluid exposed at any one time to evaporation will simply be that which can be held in the porous sleeve *g* by capillary attraction.

This apparatus may be attached to and form part of the passage for nitrous-oxide gas from the cylinder, in which it has been liquefied, to the gasometer or bag, from which it is inhaled by the patient, in which event the gas can be mixed with the vapor of any anæsthetic desired as it is passed to the reservoir from the cylinder. In this case the mixture is formed before inhalation has commenced, and any modification of it thereafter is difficult, if not impracticable. It is therefore designed to place the apparatus in the inhaling-tube proper, from which the patient inspires, so that the compound will be immediately inhaled as the mixture is made. By this method the anæsthetics may be compounded or not according to the circumstances of the case and the judgment of the operator, and the compound, if used, may be administered at that precise time when its effect will be the most advantageous.

I claim as my invention—

1. The combination, in an apparatus for administering anæsthetics, of a horizontal inhaling-tube, a reservoir for an anæsthetic fluid depending therefrom, and a capillary feeder leading from the reservoir below to the inhaling-tube above, whereby a regular quantity of anæsthetic fluid is continuously supplied to the inhaling-tube for evaporation therein, substantially as described.

2. The combination, in an apparatus for administering anæsthetics, of an inhaling-tube, a reservoir for an anæsthetic fluid depending therefrom, a valve closing said reservoir, a capillary feeder depending therefrom, and a plunger for opening the valve and exposing the feeder to the aerial currents in the inhaling-tube, substantially as described.

3. The combination, in an apparatus for administering anæsthetics, of a horizontal inhaling-tube, a reservoir for an anæsthetic fluid depending therefrom, a plunger having a vertical motion to and from the reservoir, a valve for closing the reservoir when the plunger is depressed, a valve for closing the reservoir when the plunger is elevated, and a feeder of fibrous material interposed between the two valves, the whole being so arranged that a certain definite quantity of the anæsthetic fluid may be separated from that in the reservoir and submitted to evaporation in the inhaling-tube, substantially as described.

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