W. BOEKEL.

Inhaler.

No. 196,185. Patented Oct. 16, 1877.

Fig. 1.

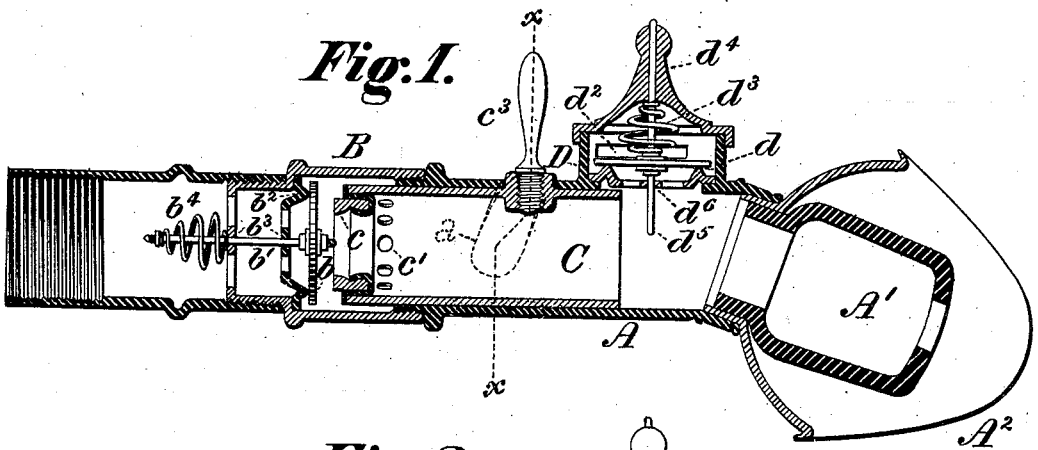


Fig. 2.

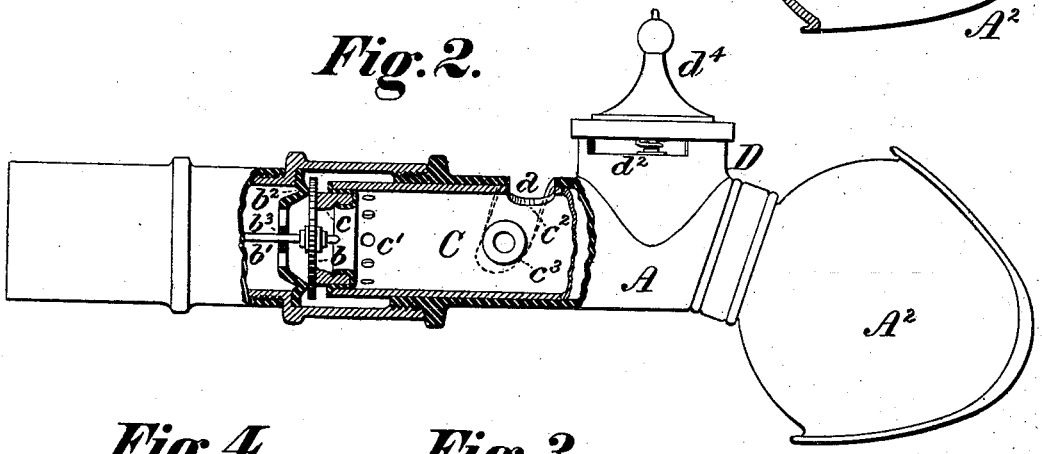


Fig. 4.

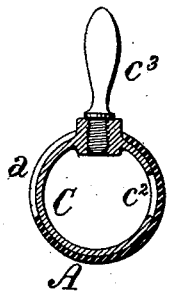


Fig. 3.

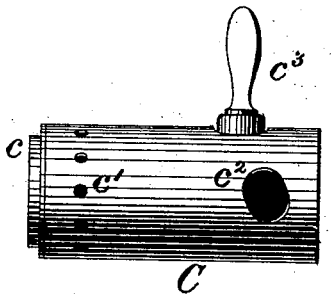
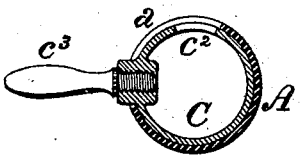


Fig. 5.



Witnesses.

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UNITED STATES PATENT OFFICE.

WILLIAM BOEKEL, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN INHALERS.

Specification forming part of Letters Patent No. **196,185**, dated October 16, 1877; application filed July 20, 1877.

To all whom it may concern:

Be it known that I, WILLIAM BOEKEL, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Inhalers, of which the following is a specification:

The object of my invention is to provide, in an apparatus for the administration of anæsthetic agents by inhalation, simple and efficient means for admitting, regulating, and shutting off the supply of anæsthetic vapor, for combining the same in desired proportions with atmospheric air, or for admitting atmospheric air only, and also to provide proper facilities for exhalation.

To these ends my improvements consist in combining, with an inhaler-tube and its mouth-piece, an internal sliding sleeve, the position of which can be so varied as either to institute communication between the mouth-piece and the inhaling-valve of the gas or vapor supply, or to close and lock the inhaling-valve and open a free passage for atmospheric air through the tube to the mouth-piece, as well as, when desired, to admit of a combined supply of air and vapor.

My improvements further consist in combining, with the inhaler-tube, an exhaling-valve working in an external casing, and provided with upper and lower guides to prevent canting or displacement, all as hereinafter more fully set forth.

In the accompanying drawing, Figure 1 is a longitudinal central section of an inhaler embodying my improvements; Fig. 2, a side view, partly in section, of the same; Fig. 3, a side view, in elevation, of the regulating-sleeve; and Figs. 4 and 5, transverse sections, each taken at the line xx of Fig. 1, and, respectively, showing the sleeve in different positions.

The tube A of the inhaler is provided at one end with a mouth-piece, A^1, of the ordinary construction, which is preferably supplemented by a mouth-hood, A^2. A valve-tube, B, is connected to the opposite end of the tube A, and has a seat, b^2, formed within it for the inhaling-valve b, which is secured upon a stem, b^1, passing through guides b^3, and is held up to its seat in the intervals between inhalations by a spring, b^4. The outer end of the valve-tube carries a proper coupling or socket for connection with a tube leading to a gas bag or reservoir. A regulating-sleeve, C, is fitted accurately within the tube A, and has a free opening at its end nearest the mouth-piece, while its opposite end, which may be either open or closed, is fitted with a circular bearing-piece, c, of rubber or other suitable elastic material, the outer face of which bears uniformly against the inhaling-valve when the sleeve is moved into the position shown in Fig. 2, and holds the valve closely upon its seat. A series of openings, c^1, are formed in the sleeve C, adjacent to the bearing-piece c, so as to establish communication between the valve-tube B and mouth-piece A^1, and a slot, c^2, is formed in the sleeve, which slot registers with a longer slot, a, formed in the tube A at such periods as the bearing-piece c is pressed up to the inhaling-valve b, so as to establish an air-supply to the mouth-piece when the gas-supply is shut off, as shown in Figs. 2 and 4.

When the sleeve C is moved into the position indicated in Fig. 1, in which position the valve b is free to operate under the influence of inhalation, the slot c^2 is covered and closed by the tube A, and no atmospheric air is admitted to the mouth-piece, as shown in Figs. 1 and 5.

The sleeve is operated by a thumb-piece, c^3, secured upon its periphery, and passing through and guided in the slot a of the inhaler-tube, and, by moving the sleeve into positions intermediate between the two above specified, a combined supply of air and gas, in graduated proportions, may be admitted to the mouth-piece.

The drawings show the slot a as inclined or helical, which form affords the advantage of locking the sleeve in any position in which it may be placed; but a rectilineal slot might be employed, if preferred, without departing from the spirit of my invention.

The exhaling-valve d rests on a seat, d^1, within an external casing, D, secured upon the tube A near its mouth-piece, and having a discharge-opening, d^2, and is maintained in position by a spring, d^3. The cap or cover of the casing D is provided with an upper guide, d^4, within which the stem d^5 of the exhaling-valve d slides freely, and, in combination with a lower

guide, d^6, maintains the parallelism of the valve with its seat, and prevents its displacement or imperfect seating.

In the operation of my improved inhaler the regulating-sleeve is first moved into position to lock the inhaling-valve and shut off the supply of gas, while admitting a free supply of air, and, the patient being prepared for the inhalation, its position is subsequently regulated by the operator as circumstances may require, so as to afford a supply of the anæsthetic vapor, either alone or mixed with atmospheric air, at such periods and in such proportions as desired. The exhaling-valve works entirely clear of the inhaler-tube, and operates freely, and without tendency to derangement, in a position which does not interfere either with the operator or the patient.

I claim as my invention and desire to secure by Letters Patent—

1. The combination of an inhaler-tube and its mouth-piece, an inhaling-valve, and an internal sliding sleeve, by which communication is established through the inhaler-tube, between the inhaling-valve and mouth-piece, or between the mouth-piece and the external air, substantially as set forth.

2. The combination of an inhaler-tube, an inhaling-valve working on a seat therein, and an internal sliding sleeve, having an elastic bearing-piece for locking the inhaling-valve, substantially as set forth.

3. The combination of an inhaler-tube, an inhaling-valve working on a seat therein, and an internal sliding sleeve having a series of openings establishing communication between the inhaling-valve and mouth-piece, and a slot or opening registering with a longer slot formed in the inhaler-tube, and which is removed from said last-named slot and closed by the movement of the sleeve, substantially as set forth.

4. The combination of an inhaler-tube, provided with an inclined or helical slot, and an internal sleeve having a thumb-piece fitted to and working in said slot, substantially as set forth.

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