(No Model.)

M. W. HOBBS.

INHALING INSTRUMENT.

No. 422,411. Patented Mar. 4, 1890.

Fig. 1

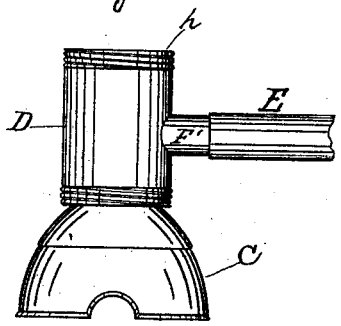


Fig 2

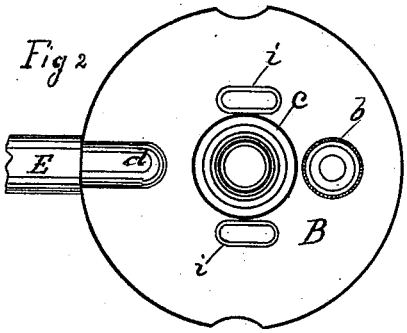


Fig. 3

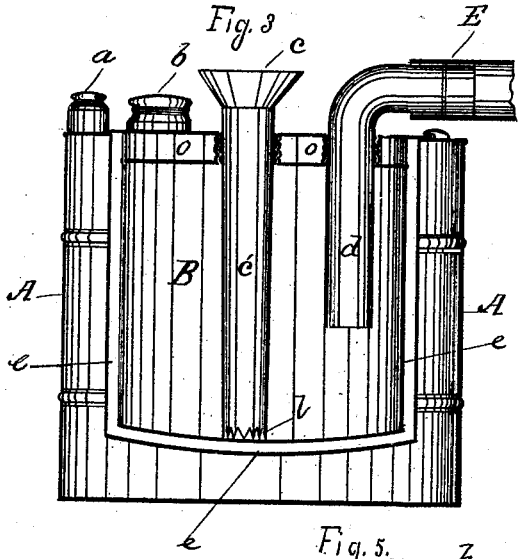


Fig. 4.

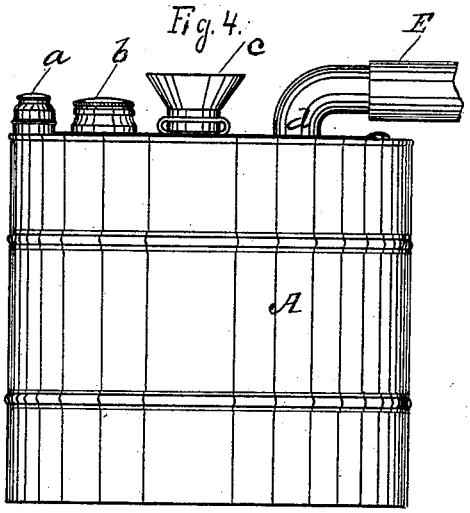


Fig. 5.

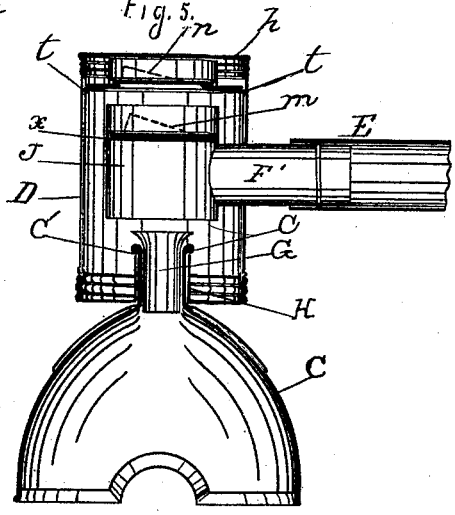
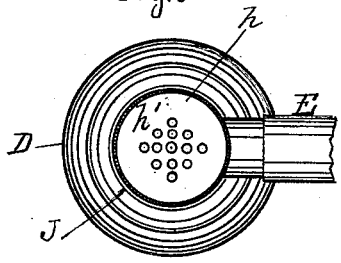


Fig. 6



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MARMADUKE W. HOBBS, OF RICHMOND, INDIANA.

INHALING-INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 422,411, dated March 4, 1890.

Application filed June 10, 1889. Serial No. 314,325. (No model.)

To all whom it may concern:

Be it known that I, MARMADUKE W. HOBBS, a citizen of the United States of America, residing at Richmond, in the county of Wayne and State of Indiana, have invented certain new and useful Improvements in Inhaling-Instruments, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to that class of inhaling-instruments employed in the administering of ether and other similar agents.

My invention consists in the devices hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation of the mouth-piece and its dome and tube attachment. Fig. 2 is a top plan view of the ether-tank, showing the connecting-tube and the openings in the top of the tank. Fig. 3 is a central vertical section of the ether-tank and its inclosing case, and showing the openings and introductory tubes and their location. Fig. 4 is a side elevation of the inclosing-case, showing the inhaling-pipe and location of the caps and tops of the tubes inside. Fig. 5 is a central vertical section of the mouth-piece and its dome, showing the position of the valves, the connection between the mouth-piece and the dome, and the attachment of the inhaling-tube. Fig. 6 is a top plan view of the dome, showing the holes for the escape of the air through the interior of the dome.

In Fig. 4, A represents the inclosing-case of my apparatus, which is constructed with double walls, oval in its horizontal plane, and having a circular opening in its center to receive the tank or reservoir B, Fig. 3.

a is the screw-top of an opening which communicates with the space made by the double walls of the inclosing-case, by which hot water or other fluids are deposited in said space, which surrounds the ether-tank B and underlies it at the bottom, as seen in Fig. 3.

b is the screw-top of an opening into the ether-tank, by which said tank is filled with ether, as desired.

c is a funnel-shaped opening fitted into a vertical tube *c'*, which occupies the center of the ether-tank. The opening *c* is open continuously and serves to admit the air into the ether-tank. The bottom of the tube *c'* is notched, as shown at *l*, Fig. 3, to allow the air thus admitted to come in contact with the ether in the tank and to supply the vacuum produced by the inspiration of the ether by the patient when the instrument is in use. The top of the ether-tank B is made double, forming a chamber *o o*, which is also filled with hot water, as desired, thus surrounding the ether-tank proper with warmed surfaces, and leaving no part of it exposed to a cooling or condensing contact. An air chamber or space *e e e* separates the outer surface of the ether-tank from the inner surface of the hot-water reservoir of the inclosing-case, by which an even temperature is maintained about the circumference and bottom of the ether-tank.

It will be seen that when the water in the inclosing-case A is becoming too cool to have its proper effect upon the ether in the tank the inclosing-case can be detached from the ether-tank while inhaling is in progress, replenished with hot water, and returned to its place without interrupting the administering of the ether, which in many cases is an important consideration.

The inhaling-tube *d*, Fig. 3, extends only a portion of the vertical distance inside the ether-tank, which may be increased or diminished at pleasure in the construction.

The dome, which is attached to the mouth-piece removably, is a vertical tubular structure provided with a screw-cap *h*, the central portion of which is occupied by a horizontal perforated plate *h'*. A ledge or shoulder *t* is formed on the inner surface of the top of the dome D, forming an annular bearing for the frame of the hinged valve *n*, which is raised by the outflow of the expiration and falls by its own gravity.

In the inspiration through the mouth-piece the air is drawn through the thimble G, and by means of the tube F', which is connected with and opens into the cylinder J, the draft is extended through the cylinder J, the tube F', and flexible pipe E and tube *d*, until it reaches the ether in the tank, thus conducting the ether directly to the mouth and lungs of the person inhaling.

J is an independent cup or cylinder closed at the bottom and having an opening at the top smaller than its diameter. Near its up-

per end and attached to its inner surface is an annular ledge or projection x, upon which rests the valve m and its frame. This valve is raised, as shown in dotted lines, by the current of air set in motion by the inspiration being held open by the current and closing when it ceases. These valves are so arranged that the act of inspiration or drawing in the breath closes the valve n, thereby excluding the outer air, while it opens the valve m and permits the flow of ether from the ether-tank B through the pipe F′ and the flexible connecting-pipe E, attached to the curved tube d, to the mouth-piece. The effect of this construction and arrangement is, that in its use only etherized air is admitted to the lungs and each expiration is carried to the discharge-point h, and no particle of it can be reinhaled. This insures perfect purity of the etherized air which is inhaled and the complete discharge and exhaust of the expiration.

By the use of warm water in the chamber of the inclosing-case A the temperature of the ether is regulated at will, and the warm water is replenished or the ether-tank refilled, as occasion requires, without interruption.

The flexible rubber mouth-piece C is made with a tubular projection at its apex C′, which is surrounded by a similar tubular projection extending downward from the bottom of the dome D, closely fitting the same when a trumpet-formed thimble G is inserted within the rubber tubular projection and its sides are pressed out against the surrounding walls until perfect contact and cohesion is secured, making a perfect connection and readily removable. In Fig. 2, i i are wire loops secured to the top plate of the ether-tank B, to which straps may be secured.

Having thus fully described my said improvement, what I claim as new, and desire to secure by Letters Patent, is—

1. In an inhaling-instrument, the dome D, provided with the screw-cap h and its perforated plate h', valves n m, cup J, and tube F′, constructed and operating in the manner and for the purpose substantially as set forth.

2. The combination of the mouth-piece C, dome D, valves n m, tube F′, flexible pipe E, tube d, and ether-tank B, as herein set forth and described.

In testimony whereof I affix my signature in presence of two witnesses.

MARMADUKE W. HOBBS.

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