

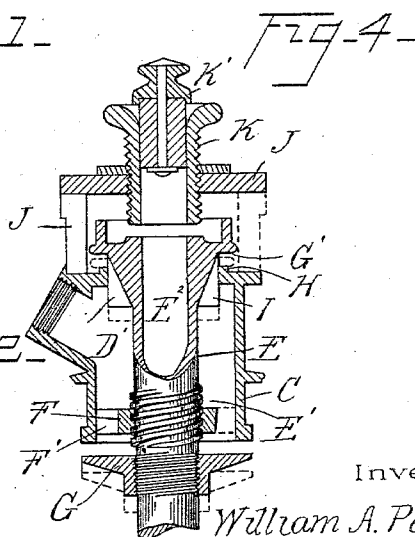
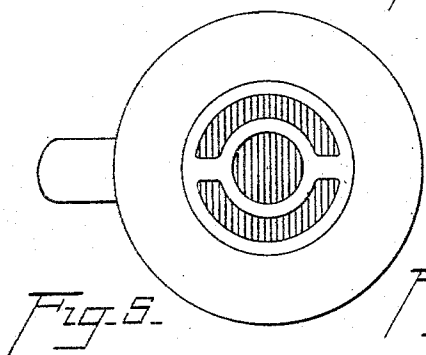
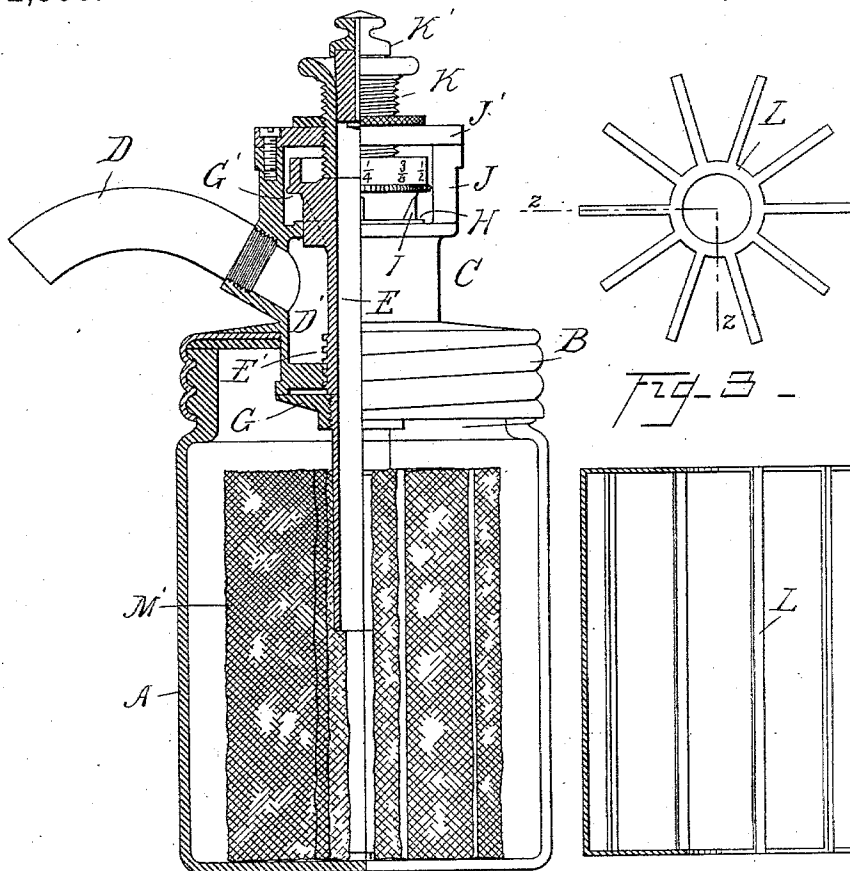
(No Model.)

2 Sheets—Sheet 1.

W. A. PENDRY.
INHALER.

No. 552,968.

Patented Jan. 14, 1896.



Witnesses:
A. F. Barthel
L. J. Whittemore

Inventor.
William A. Pendry
By *W. L. Spaguet* Esq.
Attorneys.

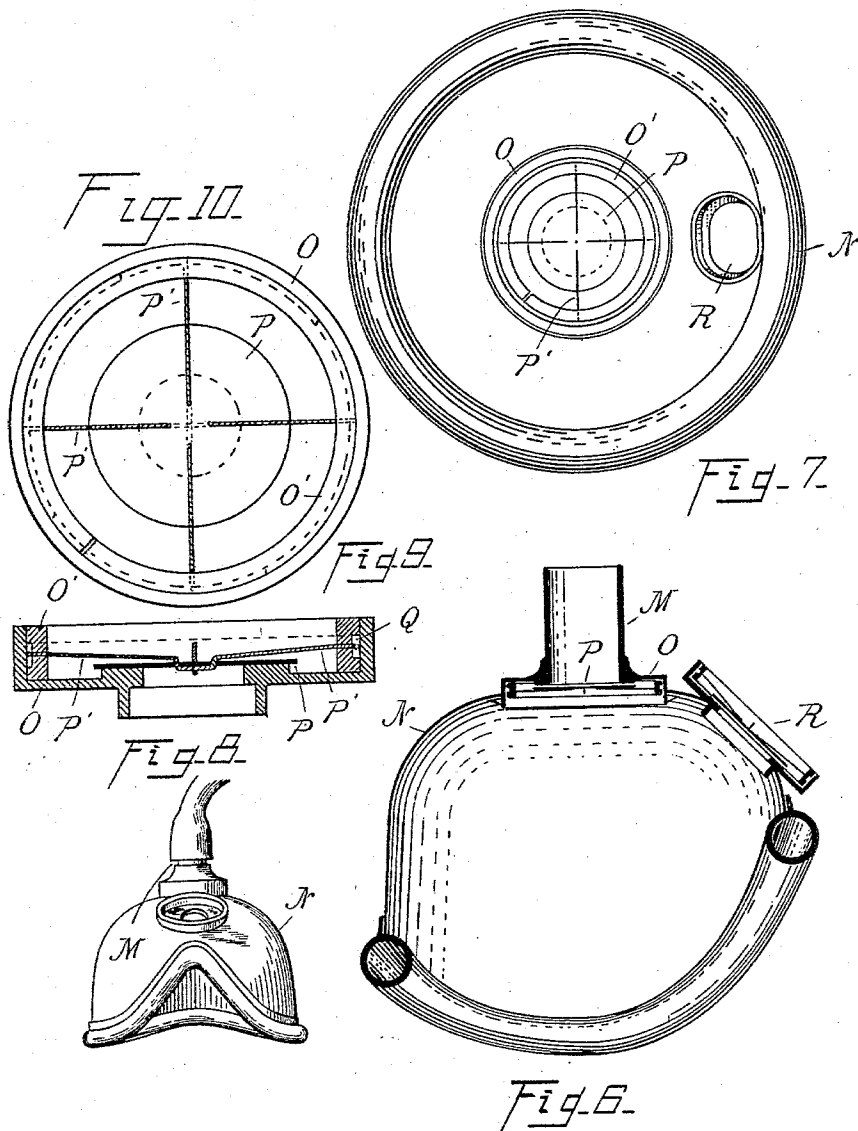
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UNITED STATES PATENT OFFICE.

WILLIAM A. PENDRY, OF DETROIT, MICHIGAN, ASSIGNOR, BY MESNE ASSIGNMENTS, TO JOHN K. GAILEY, OF SAME PLACE, AND CLEMENT A. DUNBAR, OF SOUTHFIELD, MICHIGAN.

INHALER.

SPECIFICATION forming part of Letters Patent No. 552,968, dated January 14, 1896.

Application filed January 29, 1895. Serial No. 536,561. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. PENDRY, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Devices for Administering Anesthetics, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention consists in the construction of the valves and the valve-operating devices of a device for administering anesthetics, whereby the amount of the anesthetic vapor may be varied at the will of the operator by a single controlling device, and whereby the surgeon may administer to the patient all air or all anesthetic vapor, or any proportion of air and vapor he desires without in any way impeding the respiration of the patient, all as more fully hereinafter described.

I do not intend herein to lay claim to the broad idea of employing such a controlling-valve in administering anesthetics, as that is not my invention, but to claim only the construction of the parts whereby the structural arrangement is simplified, cheapened, and made more effective.

In the drawings, Figure 1 is a sectional elevation through an anesthetic-vessel embodying my invention, showing the valves in such position as to admit air only to the patient. Fig. 2 is a vertical central section there-through, showing the valves adjusted to admit a portion of air and a portion of anesthetic air to the patient, and in dotted lines the position of the valves to admit only anesthetic vapor to the patient. Fig. 3 is a top plan view of the support for the textile anesthetic-holder in the vapor-chamber. Fig. 4 is a section thereof on line *z z*, Fig. 3. Fig. 5 is a bottom plan view of the top with the valves removed. Fig. 6 is a vertical central section through the respirator-hood. Fig. 7 is a bottom plan view thereof. Fig. 8 is a front elevation of the hood. Fig. 9 is an enlarged section through one of the check-valves, and Fig. 10 is a top plan view of Fig. 9.

A is the anesthetic-vessel preferably of

glass. B is the top or cover therefor, preferably screwed thereon, as shown in the drawings. Centrally of this top is the cylindrical body or sleeve C, depending slightly into the vessel, projecting above the cover, as shown. On one side of this sleeve is the outlet or supply tube D, which communicates with the chamber D'.

E is a stem or tube passing centrally through the sleeve C and at its middle having screw-threads E' engaging screw-threaded bearings 60 formed in a ring F, supported on arms F', near the lower end of the sleeve C.

G is a ring-shaped collar secured on the stem E in the anesthetic-vessel A and adapted to be moved to and from the lower end of the sleeve by turning the stem E so as to open or close communication from the anesthetic-chamber into the chamber D'.

The upper end of the stem E is provided with a ring-shaped bearing or flange G', adapted to open or close the top of the sleeve C, which is provided with the seat H, thus forming a valve to control the size of the opening to admit air into the chamber D'.

I are guide ribs or flanges on the outer face of the stem E for guiding or steadying it in its vertical movement.

J are arms or standards extending upwardly beyond the top of the sleeve C and having the centrally-apertured cap J' secured at the top. In the central aperture in this cap is secured a bushing or plug K, the lower end of which acts as a stop for the stem E, which is tubular. In its upper position this bushing is provided with a stopper or cork K', and when thus fitted the movement of the stem E to and from the bushing acts to proportionately open or close the port E² through the stem E, which leads to at or near the bottom of the anesthetic-chamber A.

L is a rack or frame, the top of which is centrally apertured, as shown in Fig. 3, to receive the lower end of the stem E. Upon this frame is secured fabric strips M' for absorbing the anesthetic. The tube D leads to an inlet pipe or nipple M on the respirator-hood N, which is adapted to fit over the face of the patient.

O is a flanged plate around the mouth of the nipple N, in which the ring O' is adapted to engage.

P is a thin disk or plate seated over the opening in the nipple and acting as a check-valve. This disk is suspended by a series of radial cords P' secured centrally to the disk and extending outwardly and slightly upwardly through the ring O', the outer ends thereof being secured in the annular groove Q in the outer face of the ring, which in turn is supported in the circular frame or collar O. This construction gives an especially sensitive valve which does not at all impede the respiration of the patient, easily removed and easily repaired.

The respirator-hood is provided with an exhaust-opening, which is provided with a similar valve and support similar to that described for the inlet-opening, the same being shown at R in the drawings.

The parts being thus constructed, they are intended to operate as follows: The stem E and the valves which it operates being in the position shown in Fig. 1, the operator may charge the anesthetic-chamber through the bushing K and the stem E by removing the cork K'. As soon as that cork is replaced the vessel is securely closed, the anesthetic being absorbed by the fabric strips M'. The hood being placed over the mouth and nose of the patient, as shown in Fig. 6, the inspiration of the patient, with the parts in this position, will draw air through the supply-tube D and his expiration will discharge it through the valve R, the air-supply entering beneath the ring or disk G' into the chamber D' and from thence into the tube D. Now for applying the anesthetic, the operator turns the stem E by applying his fingers to the head thereof, which projects above the sleeve C, as shown in Fig. 1, lowering the stem, which movement withdraws the upper end thereof from the lower end of the bushing, as shown in Fig. 2, and admits air through the port E² to the stem E into the anesthetic-chamber. At the same time this movement of the stem E lowers the valve or disk G from the lower end of the sleeve and allows the air which enters through the stem E to pass out, charged with the anesthetic vapor, into the chamber D' and thence to the patient through the supply-pipe D. Just in proportion as the air-supply port to the anesthetic-chamber is opened, it will be observed that the anes-

thetic-vapor valve G will be opened and the direct air-controlling valve G' will be closed so that the operator can proportion to the utmost nicety the amount of air or anesthetic vapor delivered to the patient. When the stem E is moved down to its lowest position, as shown in dotted lines in Fig. 2, the air-supply port to the anesthetic-vessel will be wide open. The vapor-exit therefrom will likewise be wide open, while the cutoff or direct air-supply passage into the pipe to the hood will be closed, so that in this position of the parts the patient will be receiving entire anesthetic vapor. The head of the stem E is graduated to indicate the proportions of air and anesthetic vapor being delivered to the patient, as shown at the right hand of Fig. 1.

What I claim as my invention is—

1. The combination with a receptacle, of a closure therefor, having an air inlet leading into the receptacle, a discharge pipe, having at one end inlet communication with the interior and exterior of the receptacle, and a hood on its outer end, and a longitudinally reciprocating valve for closing one communication to the discharge and synchronously opening the other and for opening and closing the air inlet simultaneous with the opening and closing of the port of the discharge leading into the receptacle, substantially as described.

2. The combination with the anesthetic receptacle, its cover, a sleeve through the cover forming the chamber D' within an adjustable stem in the sleeve, a head on the stem adapted to close the top of the sleeve, a ring on the stem below the lower end of the sleeve, adapted to control communication between the vessel and the chamber D', an adjustable plug at the top against which the stem strikes in its upper position and a discharge pipe from the chamber D', substantially as described.

3. The combination with the hood, having an aperture therein, of a tubular frame around the aperture, rings secured in the frame, flexible cords stretched across the rings and a disk valve to which the cords are centrally secured, substantially as described.

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

WILLIAM A. PENDRY.

Witnesses:

JAMES WHITEMORE,
M. B. O'DOUGHERTY.