

No. 733,026.

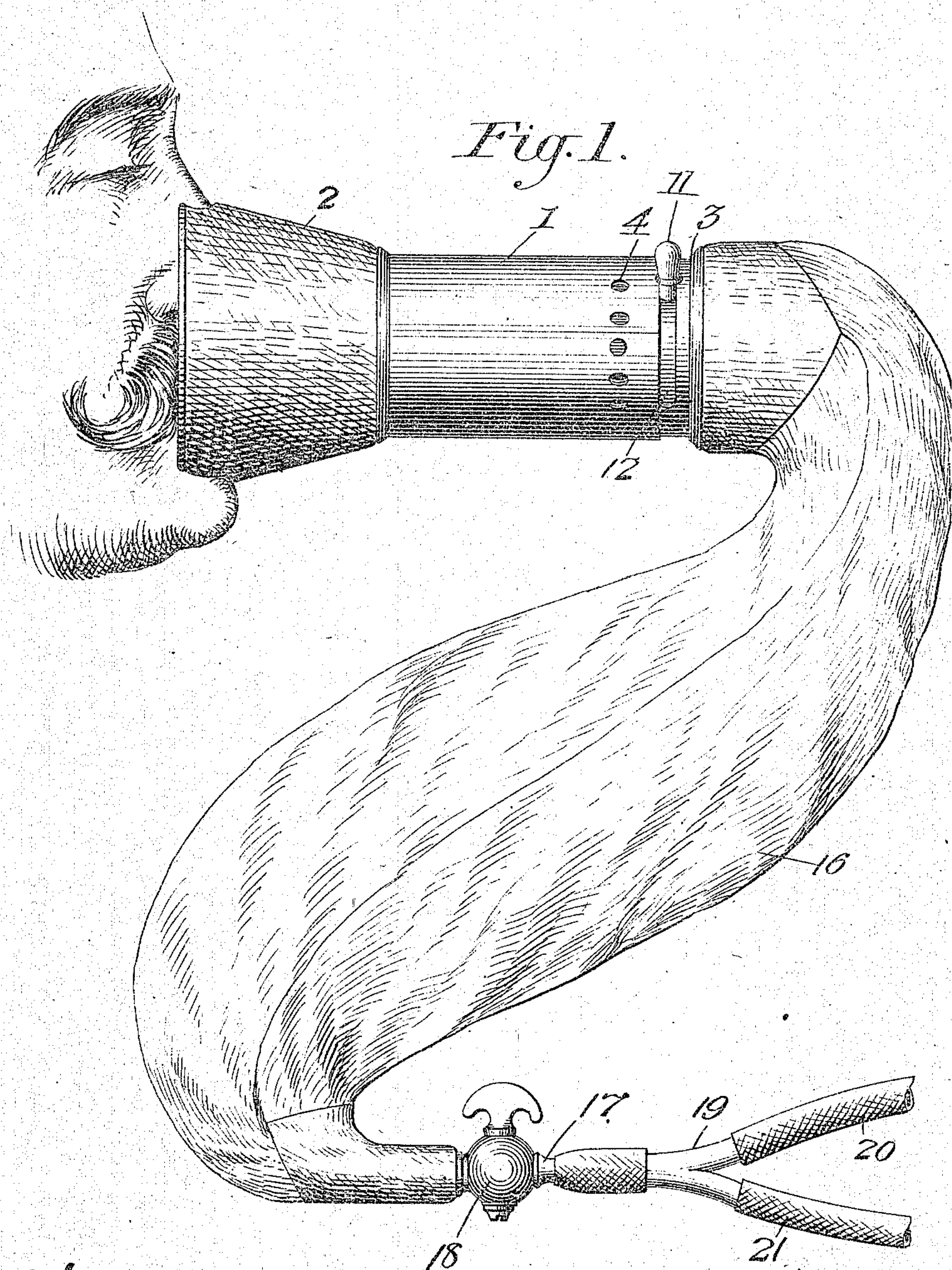
PATENTED JULY 7, 1903.

S. O. GOLDAN.
INHALER.

APPLICATION FILED JULY 11, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



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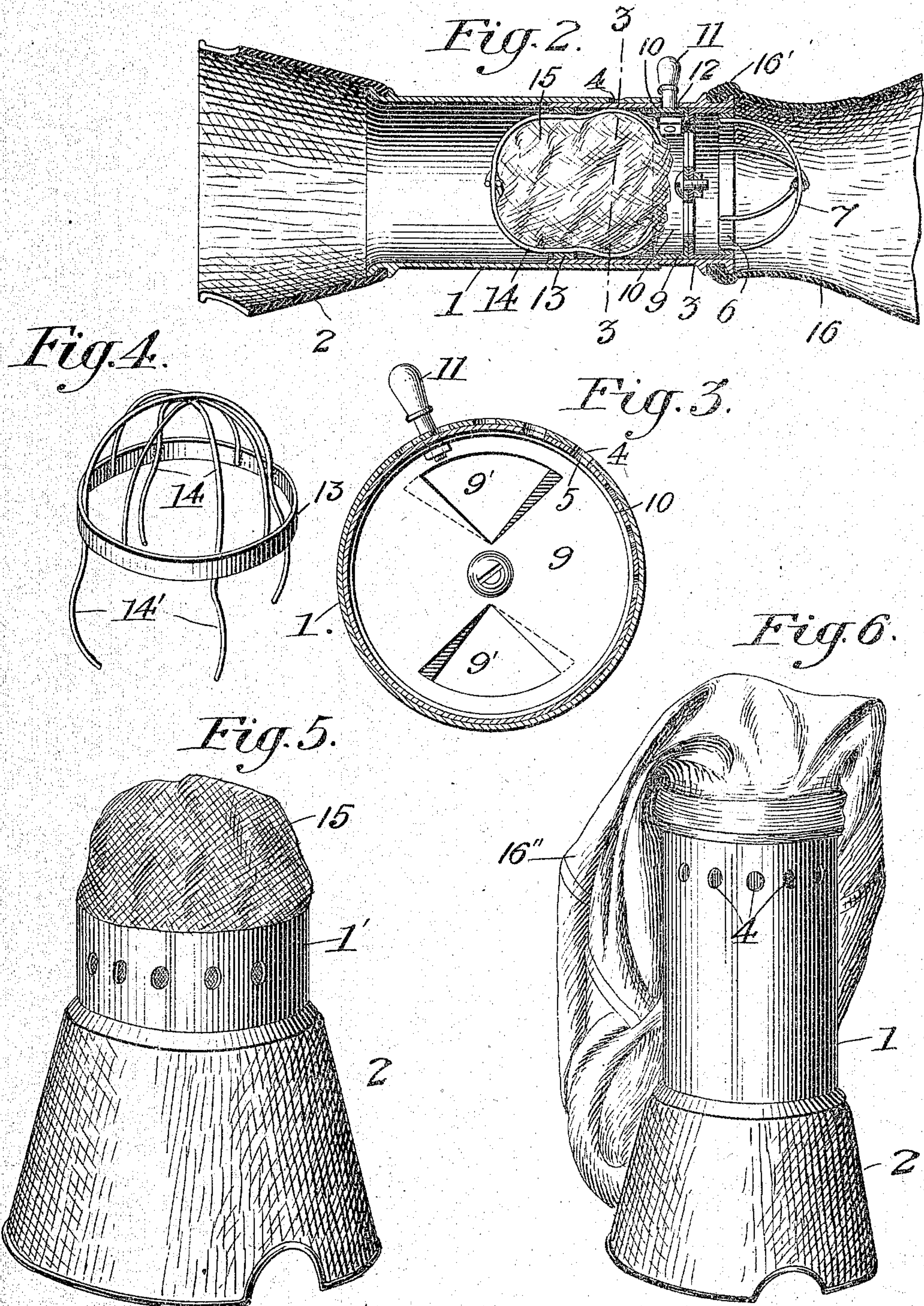
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UNITED STATES PATENT OFFICE.

SYDNEY ORMOND GOLDAN, OF NEW YORK, N. Y., ASSIGNOR TO FREDERICK TAGLIAVIA-TANINI, OF NEW YORK, N. Y.

INHALER.

SPECIFICATION forming part of Letters Patent No. 733,026, dated July 7, 1903.

Application filed July 11, 1902. Serial No. 115,180. (No model.)

To all whom it may concern:

Be it known that I, SYDNEY ORMOND GOLDAN, a citizen of the United States, residing at New York, county of New York, State of New York, have invented certain new and useful Improvements in Inhalers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to apparatus for the administration of anesthetics by inhalation, and has for its object to provide a simple, durable, and efficient apparatus that may be employed to administer anesthetics singly or in combination with others or with oxygen or in any desired relation either by the "open" or "closed" method.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a general side elevation of the inhaler, illustrating one manner of using the same. Fig. 2 is a longitudinal sectional view through the inhaler, showing the relation of the various parts. Fig. 3 is an enlarged cross-sectional view on line 3 3, Fig. 2. Fig. 4 is a perspective view of the removable basket for retaining the absorbent material that carries the liquid anesthetic. Fig. 5 is a perspective view of the inhaler as arranged for the administration of chloroform or similar anesthetic by the open method. Fig. 6 is an arrangement similar to that shown in Fig. 1, but employing a thin-rubber bag for use during ether anesthesia by the closed method.

Referring to the drawings, the inhaler comprises a main casing 1, preferably formed as a metal cylinder or tube, having secured at one end thereof a face-piece or hood 2. The latter is formed of india-rubber and is provided with recessed portions to receive the chin and nose of the patient and a rim between the recesses to lie snugly against the face and form an air-tight joint. This face-piece, which is generally funnel-shaped, is secured to the central cylinder or tube 1 by stretching the reinforced and constricted end of the face-piece over the end flange of the cylinder, as shown in Fig. 2. In the preferred form of my device the tube comprises a relatively long central cylinder, into the

distal end of which telescopes a smaller cylinder 3. These two cylindrical portions are provided with a series of circumferential perforations 4 and 5 in such relation that they may all be turned out of registry with each other or any number from one to the entire series brought into registry to accomplish objects to be described later.

Secured in the end of the smaller cylinder 3 is the flanged disk 9, provided with perforations 9', which serve to establish communication through the cylinder. Attached to disk 9, preferably by a central stud, is a rotary valve 10, provided with perforations, which are adapted to register with the corresponding perforations in the disk 9. Said valve 10 is provided with an annular flange which engages with the interior wall of the cylinder 3, to which flange is attached an operating-handle 11, extending through an elongated slot 12 in said cylinder 3, which slot determines the range of operation of the handle, and consequently the opened and closed position of the valve 10.

Secured to the flange 8 of the disk 9 is a cage or basket consisting of a ring 6, to which is attached a series of arched wires 7, which are united at their middle points to form a cage-like structure generally hemispherical in form. This device is preferably arranged to project from the end of the short cylinder-section, as indicated in Fig. 2.

Mounted within the cylindrical section 3 in close proximity to the valve or obturator is a removable cage or basket adapted to retain the absorbent material 15, which receives the liquid anesthetic. This cage or basket comprises a ring 13, which fits snugly within the end of the cylinder 3 and has attached thereto a series of intersecting arched wires 14, one end of each of which projects to constitute a bent spring and clutch member 14', all of which bear upon the interior surface of the cylinder 3 and serve to retain the cage or basket in proper position.

Secured to the outer end of the cylindrical section 3 by the usual flanges provided on the end thereof is a gas-bag 16, provided with a constricted neck 16', which constitutes an air-tight but readily-detachable connection between the cylinder 3 and the gas-bag 16.

At its opposite end said bag 16 is provided with a connection 17, having a cock 18, which connection is adapted to establish communication between a source of gas and the bag 16. In the form of my invention shown in Fig. 1 the pipe or connection 17 is in communication with a Y 19, which in turn is connected by two pipes 20 and 21 to two reservoirs of gas, as will be explained later. This form of my apparatus is adapted for general use and may be applied to administer an anesthetic either by the open or closed method for gas inhalation alone, for the administration of nitrous oxid and oxygen ether and nitrous oxid, chloroform, or any of the known anesthetics either singly or in combination with each other or with oxygen.

When the apparatus is to be used in gas-inhalation alone, the operation is as follows: The gas-bag 16 is completely collapsed, thereby forcing out all atmospheric air. The valve or obturator 10 is closed by revolving the handle 11 until it reaches the end of the slot 12 opposite the point of said slot marked "Open." The bag is then filled with gas—*i. e.*, nitrous oxid—and the inhaler applied to the face in the ordinary manner to avoid crevices through which air may enter. Obturator or valve 10 is then turned to "open" and the patient instructed to breathe in deeply. Gas anæsthesia will quickly result, and it is to be noted that as the patient is forced to breathe the mixture in the bag repeatedly it may be found desirable to renew the gas in the bag from time to time, which may be done by admitting a fresh charge by way of connection 17 and cock 18. This recharging of the bag should take place from time to time in order to keep it fairly well filled. Should it be found desirable to admit air to the patient, the end cylinder 3 may be turned to bring one or more of the perforations 4 5 into registry so that a given quantity of air may be supplied to the patient without removing the shield or face-piece. After a sufficient quantity of air has been admitted, which will be evidenced by the condition of the patient, the air-supply may be cut off by turning the end cylinder until the perforations are drawn out of registry, when the administration of gas may be continued. Should it be desired to discontinue the flow of gas for a given time, the valve or obturator 10 is closed and the perforations 4 5 brought into registry to admit air. If more air is required after the five apertures are open, the smaller cylinder is withdrawn from the larger until the series of apertures 5 appear beyond the outer end of the longer cylinder, thus affording ten apertures through which air may enter. In administering oxygen in connection with gas the bag 16 is inflated with a mixture of nitrous oxid and oxygen, which is admitted through the respective pipes 20 and 21, which are in communication with reservoirs or receptacles holding the respective gases. After the bag has

been inflated the cock 18 is closed as before and the inhaler applied as above described. It is to be noted that in applying the nitrous oxid oxygen combination the oxygen-supply is regulated by the effect produced upon the patient and not by any regulating device. If the administration of ether is to follow that of the gas, the operation is carried out as above described until the patient is anesthetized with gas. The small cylinder is then revolved within the large one until a single perforation 4 is brought into registry with a perforation 5, and through the opening thus provided ether is introduced by a suitable instrument and sprayed or poured upon the absorbent 15, and the patient is immediately brought under the influence of the ether fumes and no interruption in the anæsthesia results. Another method, which, however, would be less preferable than that above mentioned, would be to quickly remove the basket carrying the absorbent gauze 15, or have it already prepared, saturate the gauze with the requisite amount of ether, and reinsert the basket in position, pushing it well forward toward the obturator, when the inhaler is again applied. The patient thus breathes ether and gas, and should it be found necessary to admit a breath or two of fresh air it may be supplied by revolving the inner cylinder to cause the perforations 4 5 to register, as before, or by tilting the inhaler away from the face. After anæsthesia is complete the gas-bag may be removed from the cylinder and a thin rubber bag may be applied to the cylinder in lieu thereof, as shown in Fig. 6, into and from which the expirations and inspirations of the patient are drawn. The thin rubber bag is made of the fullest respiratory capacity and especially thin, thereby serving as an excellent respiratory index by its movement during inspiration and expiration. During inspiration insufflation of the gas-bag 16 or rubber bag 16" is prevented by the cage 7 in the end of the cylinder.

Ether alone may be administered by means of the inhaler, as arranged in Fig. 6, which figure represents the inhaler with the closed method; but in order to use it for the open method the small cylinder 1', with the thin rubber bag 16" attached, is withdrawn.

When it is desired to produce anæsthesia by chloroform, the open method is employed, the gas-bag 16 is dispensed with, and the absorbent 15 in the cage or basket within the cylinder is dropped with the anesthetic, and the patient caused to breathe the same freely through the open tube. In this method of application the apparatus may be arranged conveniently, as shown in Fig. 5, in which the smaller cylinder has secured to its outer end a hood or face-piece 2, while the removable basket in the opposite end thereof is surrounded by a piece of absorbent cloth, which in turn is prepared with chloroform or equivalent anesthetic.

When nitrous oxid alone is to be used, the Y-tube is detached, and one piece of rubber

tubing connects the gas-bag and the cylinder in which the gas is stored.

It is to be particularly noted that the apparatus as thus described is light, durable, portable, and inexpensive, is simple in construction and may be readily assembled or taken apart for purposes of aseptic treatment, and as it is capable of application in the administration of anesthetics by any of the methods known in practice it is equally well adapted to the use of the practitioner who administers an anesthetic only occasionally as well as in the hospital where the frequent application of anesthetics under varying conditions and by all the known methods is a matter of constant practice.

Having thus described my invention, what I claim is—

1. In an inhaler, the combination of a main casing, a face-piece secured thereto, and an absorbent-holding basket removably mounted in said casing so disposed that inspired air must pass through the absorbent.

2. In an inhaler, the combination of a main casing, a face-piece secured at one end of said casing, a gas-bag secured at the other end thereof, and an absorbent-holding basket removably mounted in said casing between said face-piece and said gas-bag and so disposed that inspired air must pass through the absorbent.

3. In an inhaler, the combination of a main casing, comprising telescoping sections, each provided with orifices adapted to be brought into registry with each other to admit variable quantities of air, a face-piece, secured at one end of said casing, a gas-bag secured at the other end thereof, and an absorbent-holding basket removably mounted in said casing adjacent to said orifices, whereby an anesthetic may be introduced through said orifices to said absorbent.

4. In an inhaler, the combination of a main casing, comprising telescoping sections, each provided with orifices adapted to be brought into registry with each other to admit variable quantities of air, a face-piece secured at one end of said casing, a gas-bag secured at

the other end thereof, an absorbent-holding basket removably mounted in said casing adjacent to said orifices, whereby an anesthetic may be introduced through said orifices to said absorbent, and a valve in said tube between the absorbent and gas-bag. 50

5. In an inhaler, the combination of a main casing, comprising telescoping sections, each provided with orifices adapted to be brought into registry with each other to admit variable quantities of air, a face-piece secured at one end of said casing, a gas-bag secured at the other end thereof, an absorbent-holding basket removably mounted in said casing adjacent to said orifices, a valve in said tube between the absorbent and the gas-bag, and a valved connection between said bag and a source of gas. 65

6. In an inhaler, the combination of a main casing, comprising telescoping sections, each provided with orifices adapted to be brought into registry with each other to admit variable quantities of air, a face-piece secured at one end of said casing, a gas-bag secured at the other end thereof, an absorbent-holding basket removably mounted in said casing adjacent to said orifices, a valve in said tube between the absorbent and the gas-bag, and a valved connection between said bag and a source of gas, said connection having multiple branches beyond the valve therein to admit a mixture of gases to said bag. 70 75 80

7. An inhaler comprising a cylindrical body portion having a hood projecting from one side thereof and an opening leading to the hood, a cylindrical holder for volatile matter rotatably mounted in the body and having an opening for registration with the openings of the body, the opening of the holder being adapted to move from registration with the opening of the body when the holder is rotated. 85 90

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

SYDNEY ORMOND GOLDAN.

Witnesses:

ANNA J. IVERS,

GEORGE H. SONNEBORN.