

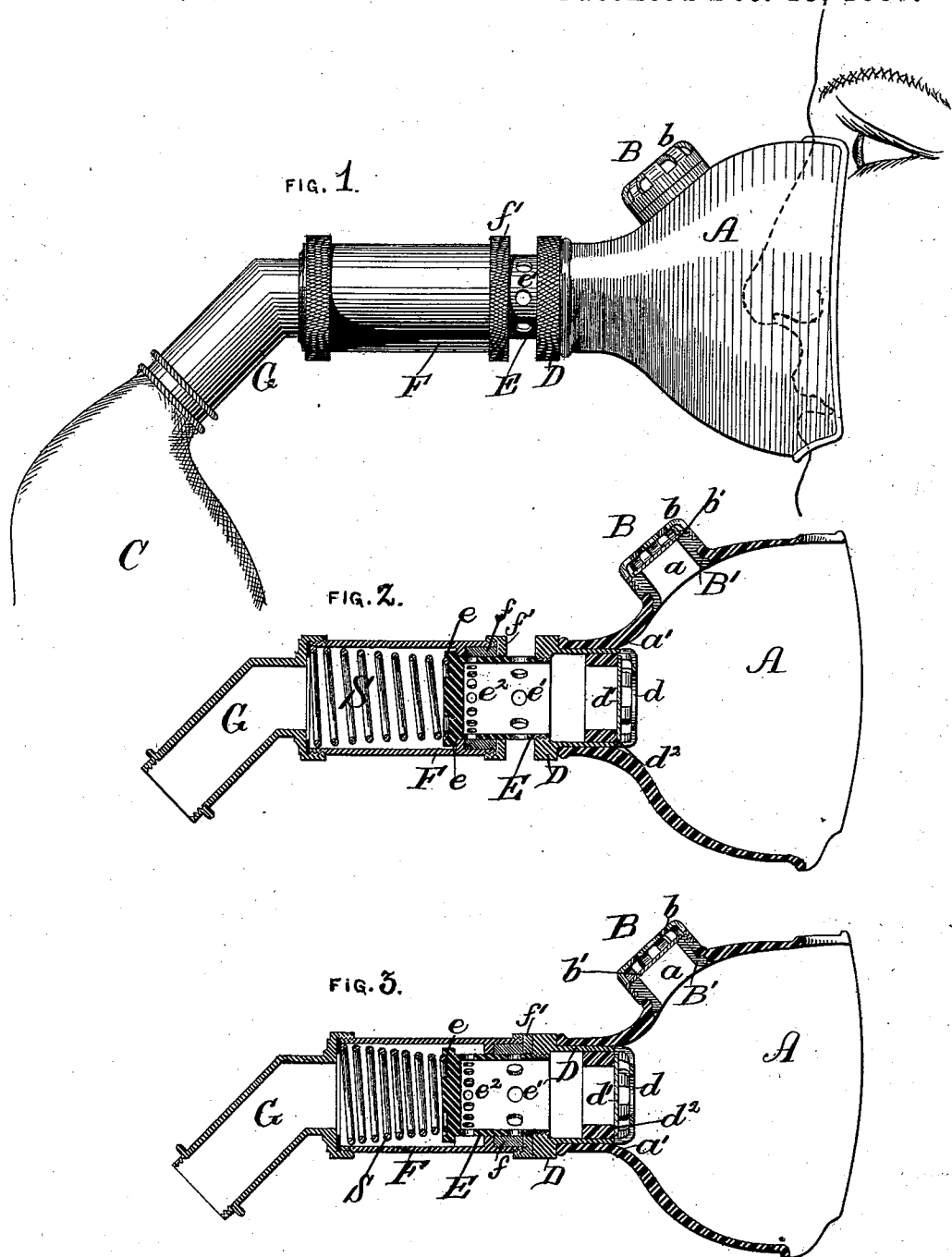
(No Model.)

2 Sheets—Sheet 1.

W. W. HARRINGTON.
INHALER FOR ANÆSTHETICS.

No. 374,831.

Patented Dec. 13, 1887.



WITNESSES:

P. I. Lancaster
James Helder

INVENTOR:

Walter W. Harrington,
by his atty
Wm. P. Norton

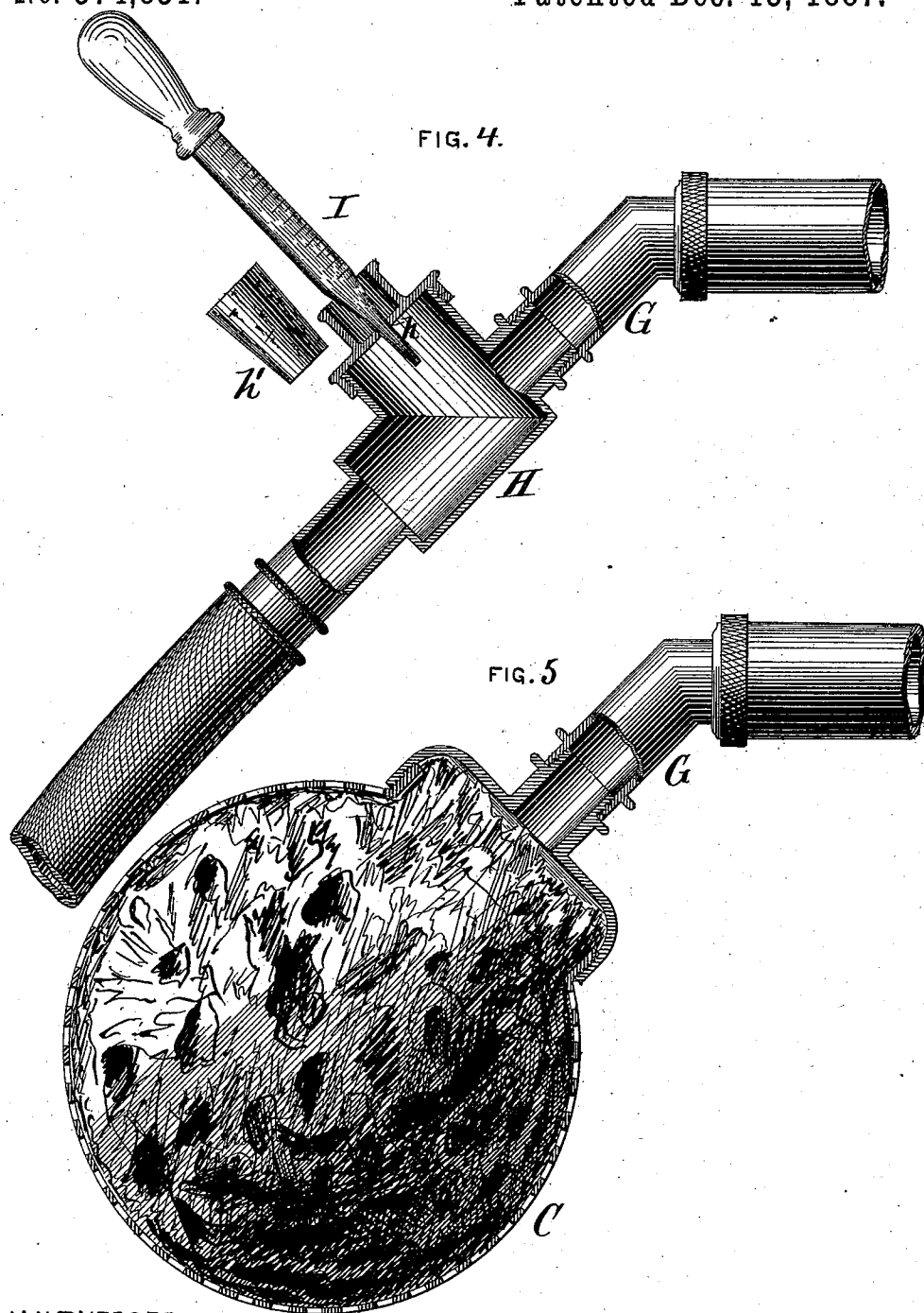
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UNITED STATES PATENT OFFICE.

WALTER W. HARRINGTON, OF CARROLLTON, OHIO, ASSIGNOR TO THE S. S. WHITE DENTAL MANUFACTURING COMPANY, OF PHILADELPHIA, PENNSYLVANIA.

INHALER FOR ANÆSTHETICS.

SPECIFICATION forming part of Letters Patent No. 374,831, dated December 13, 1887.

Application filed February 25, 1886. Serial No. 193,097. (No model.)

To all whom it may concern:

Be it known that I, WALTER W. HARRINGTON, of Carrollton, in the county of Carroll and State of Ohio, have invented certain new and useful Improvements in Inhalers or Devices for Administering Anæsthetics, of which the following is a specification.

My invention relates to inhalers or devices for administering gaseous or volatile anæsthetics—such as nitrous oxide gas, chloroform, ether, &c.—or combinations of such anæsthetics.

The main object of my invention is to provide an improved inhaler or apparatus for administering anæsthetics of that class having automatically-operated valves, whereby, upon the application of the inhaler to the face of the patient, the escape of the gas or anæsthetic to the patient's lungs is automatically permitted and the escape of the expired breath provided for, and which apparatus, on being removed from the face of the patient, automatically closes the opening or openings leading from the gas-bag or anæsthetic-chamber, so as to confine the anæsthetic and keep it from the lungs of the patient and prevent its being wasted.

My invention consists of certain novel constructions, organizations, and combinations of parts, which I will first describe in detail, and then particularly point out at the close of this specification, and some of which may be used without the others.

In the accompanying drawings my improvements are shown as embodied in the best way now known to me, and therefore in the preferred way.

In said drawings, Figure 1 is a view in elevation of the inhaler applied to the face of a patient and attached to a gas-bag for the administration, for example, of nitrous oxide as an anæsthetic. Fig. 2 is a longitudinal section through said apparatus. Fig. 3 is a similar section with the parts in a different position—*i. e.*, with the inhaling opening or openings open to administer the anæsthetic. Fig. 4 is a view, partly in section, of a portion of the inhaling-tube, showing one way of administering a combination of anæsthetics with my improved inhaler. Fig. 5 is a view, partly in

section, showing the inhaling-tube as provided with a perforated ball holding a sponge saturated with the anæsthetic to be administered.

My improved apparatus preferably embodies a hood, A, preferably made of india-rubber, to be applied to the face of the patient, as clearly shown in Fig. 1, so as to cover the nose and mouth in a well-known way. An exhalation-valve, B, is fitted to an opening, *a*, in the hood A, and consists, preferably, of a slotted or open-work cap, *b*, within which works a thin valve-disk, *b'*, covering said exhalation-opening *a* in the hood, said opening being preferably formed by a tube, B', inserted in the hood A. The valve-disk *b'* is fitted to move to and from the valve-opening *a*, and obviously when an exhalation of the breath takes place the disk will be carried up or outwardly against the perforated cap *b* and permit free escape of the expired breath, while when an inhalation takes place the suction or vacuum draws the disk *b'* tightly against the edges surrounding the valve-opening, and effectually prevents the entrance of external air through said opening. The administration of the anæsthetic takes place, preferably, through a tubular or pipe connection between the hood A and the chamber C containing the anæsthetic.

A pipe-section, D, is fitted into a tubular opening, *a'*, in the outer end of the hood A, and said pipe-section, at its inner end, is fitted with a perforated end or cap, *d*, forming a seat for a valve-disk, *d'*, fitted to close against an annular shoulder, *d''*, in said pipe-section. The valve-disk *d'* plays back and forth between the annular shoulder *d''* and the end of the perforated cap *d*, so as to open or close the opening of the pipe-section D to the hood.

Fitted in the outer end of the pipe-section D, by screw-threads or otherwise, is a pipe-section, E, having a smooth periphery and terminating in an annular shoulder, *e*. Near the inner end of the pipe-section E is an opening, and preferably a series of openings, *e'*, and near the outer end thereof is another opening, and preferably a series of openings, *e''*. Fitted upon this pipe-section E is the inner end of a main pipe-section, F, which I will call the "handle-section" of the apparatus. Said

handle-section F has a packing, *f*, and is fitted to move backward and forward and turn or swivel upon the pipe-section E, so that when in its innermost position, as shown in Fig. 3, the series of air-inlet openings *e'* will be closed, while free communication with the outer end of the pipe or tube communicating with the anæsthetic-chamber is afforded by means of the series of anæsthetic-inlet openings *e''*, as will be obvious.

It will be equally obvious that when the handle-section F is in its outermost position, or at the end of its outward movement upon the pipe-section E, as limited by the shoulder *e*, Figs. 1 and 2, the series of openings *e''* leading from the anæsthetic-chamber will be closed, while free entrance to the hood and to the lungs of the patient is afforded to the atmospheric air through the series of openings *e'* and the valve *d'*, hereinbefore described. By the turning or swiveling connection between the hood and handle the instrument is readily accommodated to the face.

The handle-section F is fitted at its outer end with a preferably bent pipe connection, G, which may be attached directly to the gas-bag or anæsthetic-chamber C, as shown in Figs. 1 and 5. The handle-section F of the inhaler contains a preferably compressed spiral spring, S, bearing at one end upon the outer end of the pipe-section E, and at the other end against a shoulder formed at the outer end of the handle-section F, whereby it will be obvious that the normal position of the handle-section of the inhaler is a position closing the series of openings *e''*, which permit the passage of the anæsthetic to the lungs of the patient. Suppose, now, that the anæsthetic is to be administered: The inhaler is grasped by the handle-section and the hood is applied to the face. If the patient be timid the pressure is light, so that the handle-section is not moved backward upon the pipe-section E. This permits of the patient freely inhaling the atmospheric air through the openings *e'*, the valve *d'* being carried backward to permit the free entrance of the air on the inhalation of the patient. When the patient exhales, the valve or disk *d'* is closed by the pressure of the exhaled breath, and the exhalation-disk *b'* is carried back, so as to uncover its opening and thus permit the free escape of the expired breath. At the proper time—which is always determined by the stamina and characteristics of the patient to be anæsthetized, or the judgment of the operator—pressure is exerted upon the handle-section to move it backward on the pipe-section E and close the air opening or openings *e'* and at the same time uncover the gas-inlet opening or openings *e''*, so that upon the inhalation of the patient the anæsthetic will be breathed directly into the lungs to produce anæsthesia, and when anæsthesia is produced the pressure upon the handle-section of the inhaler is released and the gas opening or openings is or are immediately closed by the action of the spring S, which thrusts the handle-section for-

ward upon the pipe-section E to securely close said gas-openings. This closure of the gas-openings is gas-tight, which is insured, preferably, by means of a suitable packing, *f*, fitted within the handle-section, as clearly shown in Figs. 2 and 3, and secured in place by a screw-cap, *f'*, for example.

I have shown in Fig. 1 my improved inhaler as attached to a gas-bag, such as is usually applied for administering nitrous-oxide gas in producing anæsthesia.

In Fig. 4 I have shown an additional pipe-section, H, to which the gas-bag may be attached, and which section is provided with an opening, *h*, closed preferably by a plug or stopper, *h'*, for example.

It is sometimes desirable to administer chloroform, or other anæsthetics, in connection with nitrous-oxide gas, and I provide a ready means of doing this by the use of the perforated section H and the stopper *h'*, above described.

When the combined or compounded anæsthetic is to be administered—for instance, chloroform with the gas—the stopper *h'* is removed, which affords an opening for the entrance to the inhaling-tube of a drop-tube, I, which may be a graduated tube, so as to administer the exact amount of the anæsthetic desired. When the gas alone is to be administered, the drop-tube I is removed and the opening *h* stopped or closed by the plug or stopper *h'*, which closes all entrance to the inhaling-tube, except that leading from the gas-chamber.

When gas is not to be administered, and a volatile anæsthetic is to be used—such as chloroform or ether—a perforated ball, constituting the anæsthetic-chamber C, may be attached to the end of the inhaling pipe or tube, by means of screw-threads, for instance, as shown in Fig. 5, to hold a sponge, which may be saturated with the anæsthetic to be administered, and which is volatilized and carried, at the inhalation of the patient, to the lungs to produce anæsthesia.

From the above it will be seen that I have produced an improved automatic inhaler, very simple and effective in its construction and operation, and adapted for a wide range of uses in connection with various anæsthetics. Most of the parts being tubular, in the preferred organization I have described, are easily fitted together and insure the nice, certain, and effective working of the apparatus.

I have thus set forth my improvements, together with several ways of utilizing them by the dentist and surgeon, or other operator, who may desire to produce anæsthesia in a patient; and I wish it understood that my improvements are not limited to mere details, and, as I have stated above, that some of my improvements may be used without the others. I also desire to say that I do not broadly claim an automatic inhaler, as that is not new with me, and is hereby expressly disclaimed.

I claim as my invention—

1. An inhaler provided with a tubular or pipe portion fitted with two independent openings or series of openings, in combination with a movable section adapted to close either of
5 said series of openings, substantially as described.

2. The combination, in an inhaler, of a tubular or pipe portion having an inlet-valve at its rear end and a double series of valve-openings or holes near the front end, a handle
10 fitted to slide backward and forward on said front end of said tubular portion, and a spring to throw said handle in one direction and keep it in a normal position to close one series of
15 said openings, substantially as described.

3. The combination of the hood, the exhaling-valve, and the tubular pipe portion fitted with an inhaling-valve, and a double set of openings in advance of said last-mentioned
20 valve, with a sliding handle-section adapted to close one set of said openings and open the other, substantially as described.

4. The combination of the hood, the exhaling-valve fitted in said hood, the tubular pipe
25 portion, the inhaling-valve at the end of said pipe portion, the separate openings in said pipe portion in advance of said inhaling-valve,

one for the admission of external air and the other for the admission of the anæsthetic, the sliding handle-section fitted to move back and
30 forth to cover and uncover said openings, respectively, and the actuating-spring to maintain said handle-section in a normal position over one of said openings, substantially as described.

5. An inhaling apparatus in which is combined a mouth-piece or hood and a handle section or portion by means of a swivel-connection, substantially as described, whereby
35 the handle portion and hood may turn or swivel to accommodate and adjust themselves to each other, as before set forth.

6. An inhaling apparatus in which is combined a mouth-piece or hood and a handle-section, by means of a swivel-connection, and
40 a tubular pipe portion fitted with an inlet-opening to be closed or opened by said swivel-connection, substantially as described.

In testimony whereof I have hereunto subscribed my name.

WALTER W. HARRINGTON.

Witnesses:

WILLIAM MCCOY,

WILLIAM J. BLACK.