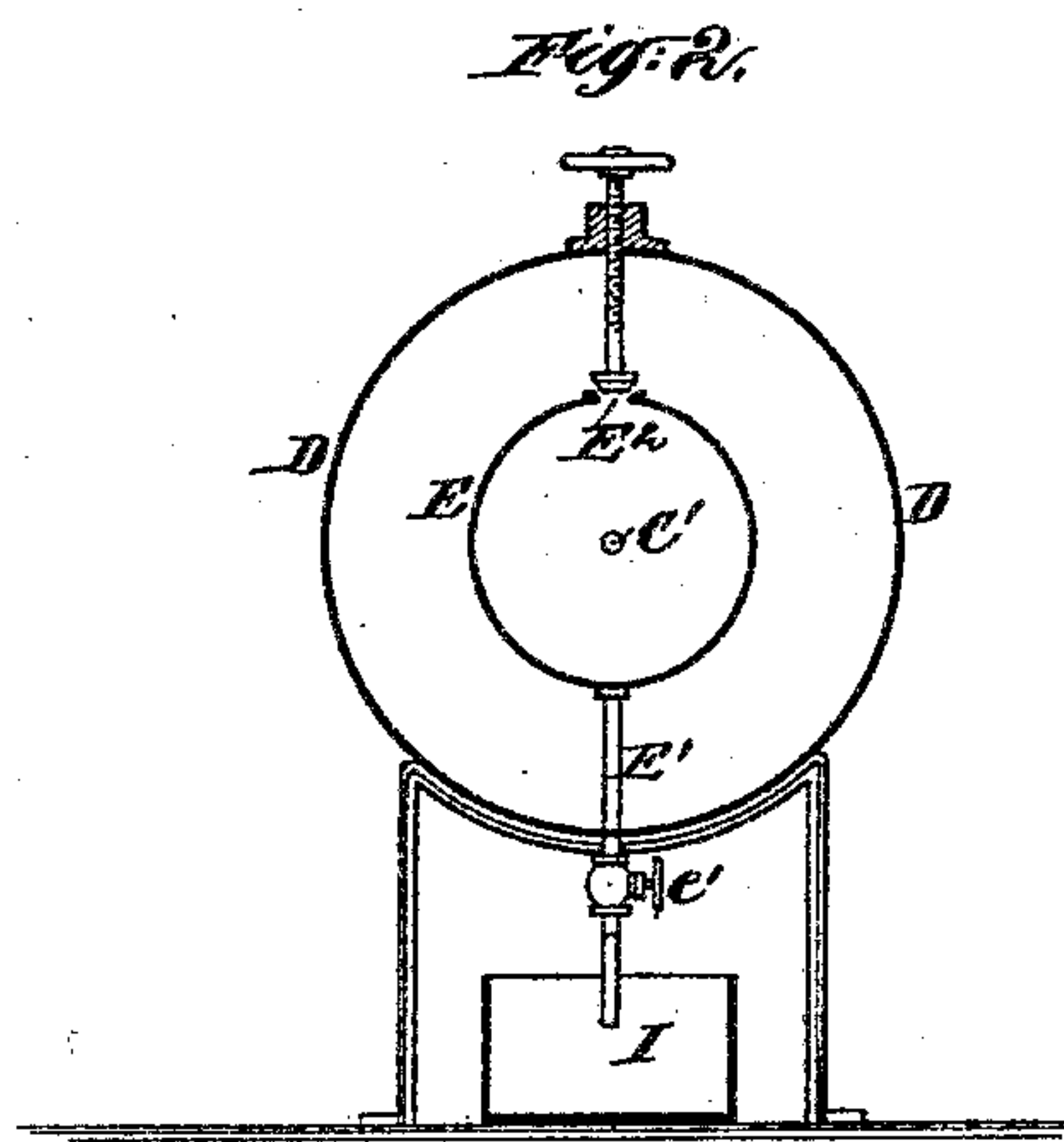
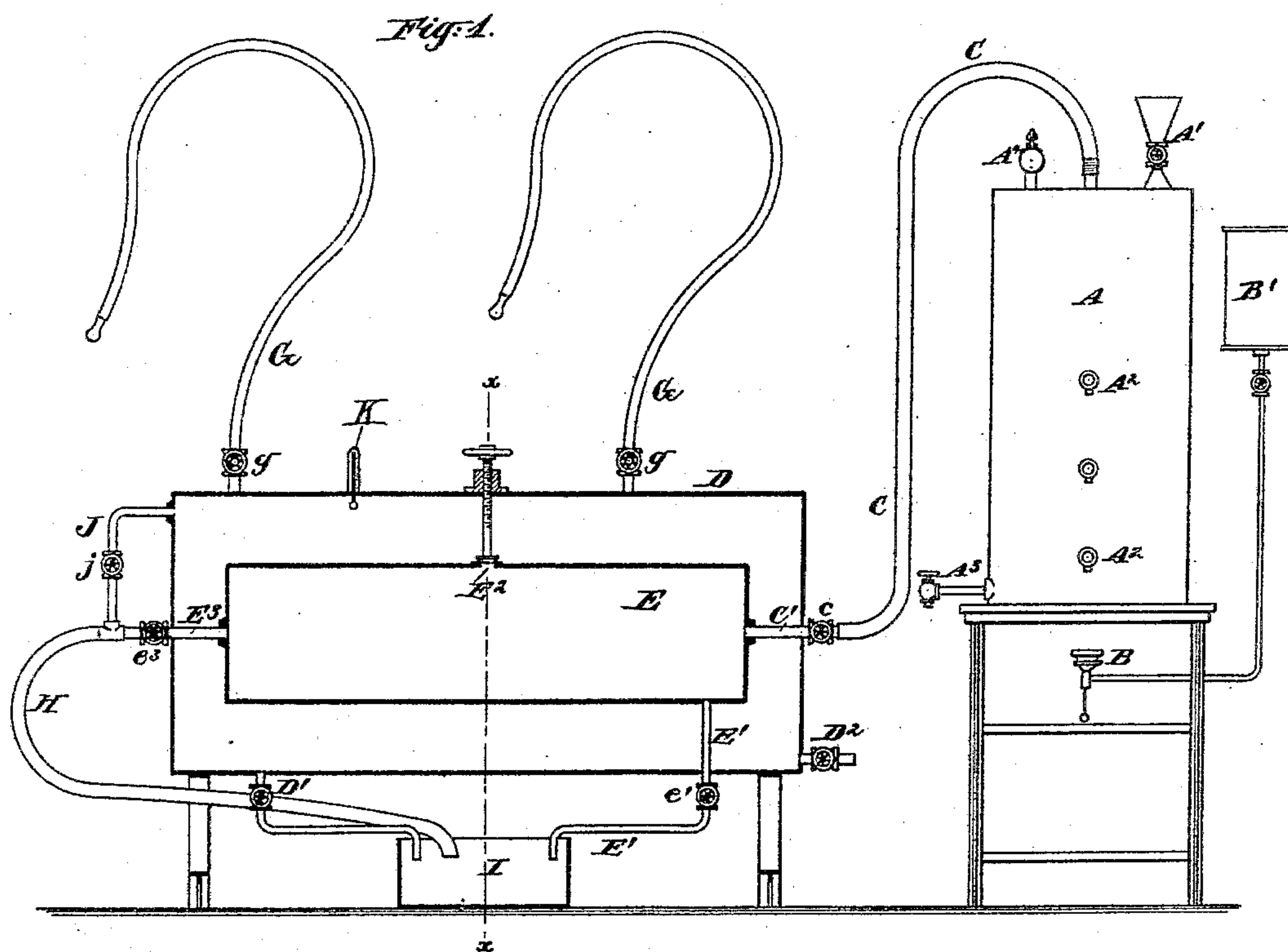


(No Model.)

W. S. WORTHINGTON.
INHALER.

No. 414,358.

Patented Nov. 5, 1889.



Witnesses:

Charles R. Searle,

L. A. Jones

Inventor:

William S. Worthington

by his attorney

James Dyer Peterson

UNITED STATES PATENT OFFICE.

WILLIAM S. WORTHINGTON, OF WINFIELD, NEW YORK.

INHALER.

SPECIFICATION forming part of Letters Patent No. 414,358, dated November 5, 1889.

Application filed July 22, 1889. Serial No. 318,205. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. WORTHINGTON, of Winfield, near Brooklyn, in the county of Queens and State of New York, have invented a certain new and Improved Apparatus for Inhaling Vapor for the Treatment of Throat and Lung Diseases; and I do hereby declare that the following is a full and exact description thereof.

The apparatus provides convenient means for tempering the air with any desired proportion of the vapor of water or of any medicated or otherwise modified vapor which may be employed, and for insuring that the air and steam or other vapor shall be in a proper mixed condition, and for allowing any desired number of patients to be treated at once.

I will describe the apparatus as using pure atmospheric air and steam, the steam being produced from water alone in a small boiler provided for the purpose and heated by a lamp. It will be understood that the boiler may contain any fluid or mixture, as a decoction of herbs or Pond's Extract, and that the heat may be applied by other means. When pure steam is used, it may in many situations be taken from heating-pipes or from pipes conveying steam to be used for power.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawings form a part of this specification.

Figure 1 is a vertical section of the main portion of my apparatus. Other portions are shown in elevation. Fig. 2 is a vertical cross-section on the line $x x$ in Fig. 1.

Similar letters of reference indicate like parts in both the figures where they appear.

A is an upright boiler having means A' for introducing water, means A^2 for determining the level of the water therein, means A^3 for draining when desired, and a gas-burner or heat-producing lamp B. A flexible tube C leads steam from the top of this boiler to be used by mixing with the air, as will presently appear.

D is a cylindrical case inclosing another case E, of less diameter and less length. The pipe C' , receiving steam through the flexible

tube C, extends through the end of the case D and communicates with the interior of the inner cylinder E. A pipe E' leads the condensed water out from the lower part of E, controlled by a cock or valve e' . This cock will in practice be set a little open, so that the steam can always escape as fast as it condenses, and somewhat faster, and the pipe E' will be left untrapped.

E^2 is a valve capable of fine graduations of position and of allowing a proportionately-modified current of steam from the boiler A to flow out from the inner vessel E and mingle with the hot air which fills the space between the outside of E and the inside of D. This is usually set a little open.

D^2 is a cock admitting the external air into the case D at one end near the bottom. This air is warmed by contact with the extended hot surface of the inner vessel E, and rises, mingling with the steam from the valve E^2 and forming a mixture properly conditioned for breathing with the best effect.

D' is a cock, which allows the water collecting by the condensing of any steam between the vessels E and D to escape.

G G are inhaling-pipes of vulcanized india-rubber or other suitable flexible material, communicating with the space between the interior of the vessel D and the exterior of the vessel E, or, in brief, with the interior of E. Each is controlled by a valve g , and is provided with a mouth-piece for convenient use by a patient. There may be any desired number of these pipes G and their attachments. The steam-pipe C C' and the air-induction cock D^2 should be of sufficient capacity to supply many inhaling-pipes G. Each patient inhales through the mouth-piece from the proper tube G and exhales through the nose. A valve c controls the induction of steam through the pipe C C' into the inner vessel E. This is important additional to the provision E^2 for controlling its escape from E into the air to be breathed, for the reason, among others, that the closing of E^2 alone, while it may reduce or exclude entirely the vapor from the air reaching the inhaling-pipes, cannot exclude the heat, and the air is liable to become too hot and dry. Partially closing the

cock *c* and opening liberally the valve E^2 avoids this evil.

I provide for a circulation of air through the apparatus other than by breathing it.

5 H is a rubber hose-pipe of liberal size, terminating, like the discharge-pipes from the drain-cocks D' and E' , over or within a drip-pan or waste-collector I, to avoid wetting the floor. A passage E^3 , controlled by a cock e^3 ,
10 leads into this pipe H from the interior of E, and another pipe J, controlled by a cock j , leads into H from the breathing-space within the case D. This valve or cock j may usually stand wide open, and air rising in the heated
15 interior of D will flow out through J, and, becoming cooled in the latter, will descend and escape, except what is required to supply the patients through the several pipes G.

20 A^4 is a safety-valve on the boiler A. The lamp B may be fed with petroleum from an elevated fount B' .

My apparatus is adapted for graduating the temperature and the proportions of the air and vapor with great nicety, and when the
25 right conditions have been attained about the same temperature and the same moisture can be maintained indefinitely, even if the number of patients using the apparatus varies widely and rapidly.

30 K is a thermometer favorably placed to show the attendant the temperature of the mixture in the vessel D.

Modifications may be made by any good mechanic without departing from the principle
35 or sacrificing the advantages of the invention. Each inhaling-pipe G may have a self-acting valve to prevent any possible return of air and vapor to the interior of D after it has once been taken out through the inhaler. There
40 may be provisions for sounding an alarm if the proportion of steam becomes too great. I have in my experiments found the parts above described sufficient for every exigency.

I claim as my invention—

1. In combination, the outer case D and interior casing E, provisions for introducing
45 steam into one and air into the other, and the valve E^2 , with provisions for operating it at will for allowing more or less steam to mingle with the air, as herein specified. 50

2. In combination, the outer case D and interior case E, with provisions for introducing steam into the innermost and air into the outermost, and a valve E^2 , for allowing steam
55 to mingle with the air; and a set of independent inhaling-tubes G G, each having its proper controlling-valve g arranged to allow many patients to be served at once, as herein specified.

3. In combination, the outer case D, with
60 valve D^2 , for air-induction, the inner case E, with pipe C and cock c for steam-induction, the valve E^2 , for mixing steam and air, the inhaling-pipes G, for allowing several patients to be served at once, and the air-exit valve,
65 lower case j , arranged to allow a circulation of the air and steam and the discharge of a portion to maintain the purity of the remainder, as herein specified.

4. In an inhaling apparatus, the case D, with
70 provisions, as the interior case E and steam-connections, for heating and mixing steam with the air, the drip-pan I, drain-pipes D' E' , and discharge-pipe H, combined and arranged to serve as herein specified. 75

In testimony whereof I have hereunto set my hand, at Winfield, Queens county, New York, this 13th day of July, 1889, in the presence of two subscribing witnesses.

WILLIAM S. WORTHINGTON.

Witnesses:

S. FISK WORTHINGTON,
EDWD. H. WEBER.