

(No Model.)

2 Sheets—Sheet 1.

V. W. BLANCHARD.
INHALER.

No. 579,815.

Patented Mar. 30, 1897.

Fig. 1.

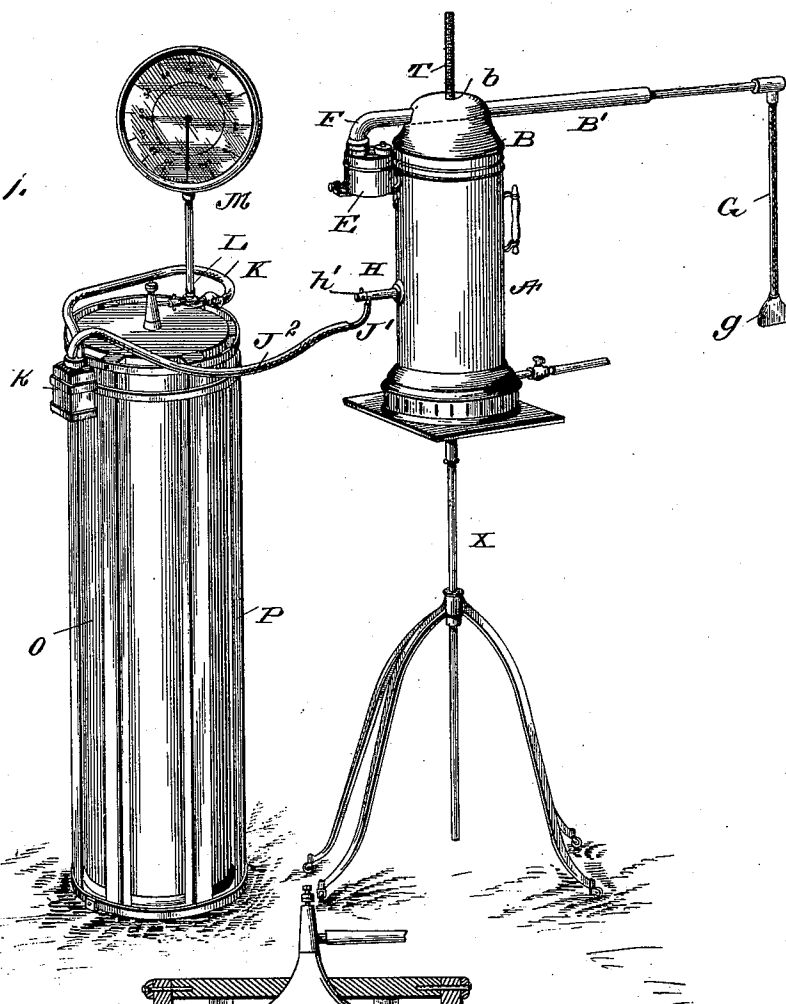
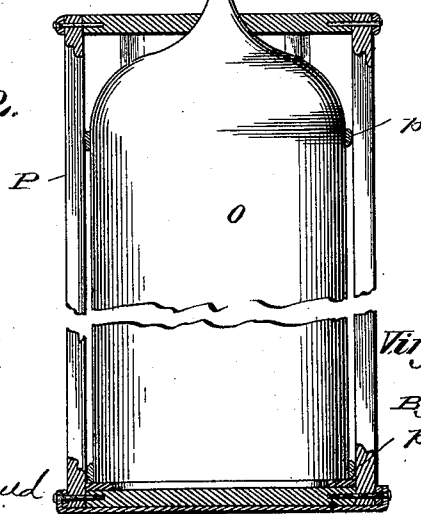


Fig. 2.



Witnesses

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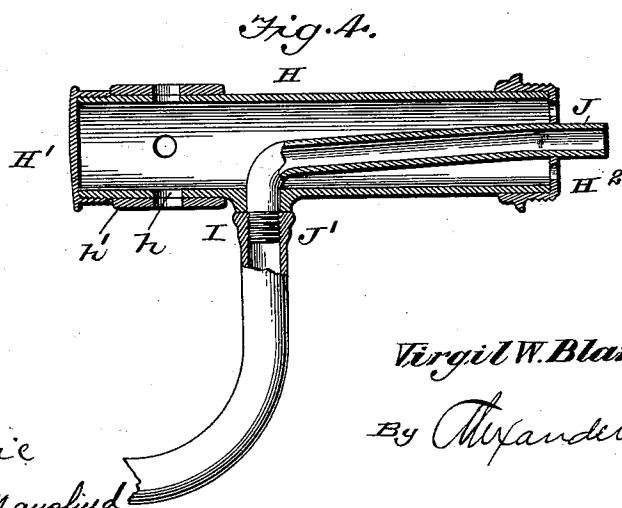
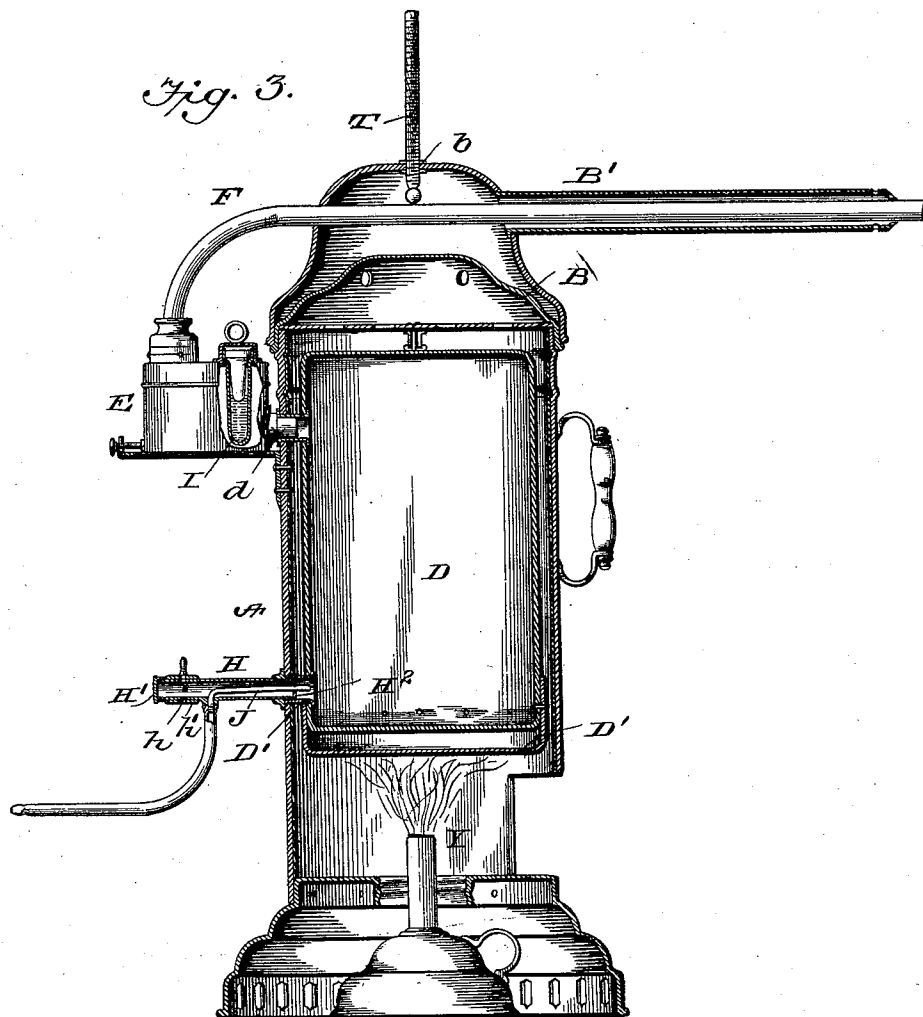
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2 Sheets—Sheet 2.

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Witnesses

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UNITED STATES PATENT OFFICE.

VIRGIL W. BLANCHARD, OF NEW YORK, N. Y., ASSIGNOR TO G. B. UNDERWOOD & CO., OF SAME PLACE.

INHALER.

SPECIFICATION forming part of Letters Patent No. 579,815, dated March 30, 1897.

Application filed March 8, 1895. Serial No. 541,017. (No model.)

To all whom it may concern:

Be it known that I, VIRGIL W. BLANCHARD, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Inhalers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

This invention is an improved inhaler for medicinal purposes, and is especially designed for the safe administration of oxygen gas to patients in bed. The oxygen gas may be administered in prescribed quantities from a reservoir under high pressure and may also be mingled with atmospheric air, if desired, and combined with moisture and antiseptic remedies, if necessary.

The invention contains the following novel elements: first, a removable reheater applied to the top of the inhaler for reheating the gaseous current and preventing cooling in its journey; second, a safety-cage applied to the reservoir; third, a pressure-gage showing the pressure within the reservoir and determining the volume of gas removed in a given time; fourth, an entry-tube for the air and oxygen; fifth, a double bottom to the heating vessel to prevent its destruction by overheating and rapid oxidation.

The invention therefore consists in the construction and combination of parts set forth in the claims, and a particular form of apparatus is illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the complete apparatus. Fig. 2 is a sectional view of the gas reservoir or holder. Fig. 3 is a central vertical section through the heater and vaporizer. Fig. 4 is a longitudinal section through the air-valve and oxygen-mixer.

The heater proper comprises an outer casing A, an inner air-drum D, an exterior vaporizing-chamber E, communicating with the drum by a pipe *d*, and the medicament-holder I within the chamber, said parts being sub-

stantially constructed and operating like the similarly-lettered parts shown and described in my application for Letters Patent, filed June 25, 1894, Serial No. 515,625. To the bottom of the air-drum is attached a false bottom D', which protects the bottom of the drum from direct contact with the flames and overheating, and as substantially pure oxygen is passed through said drum the false bottom is most essential to prevent rapid destruction of the drum.

On top of the casing A is fitted a removable cap B, which traps the hot air escaping from the casing A and constitutes a second or auxiliary heating-chamber, which is provided with a flue or outlet-pipe B', that extends laterally from the cap and has openings in its extremity for the escape of the heated air. Cap B has an opening *b* in its top for the reception of a thermometer T, by which the heat can be regulated.

The tube F is connected to chamber E as described in my aforesaid application, but is elongated and turned so as to extend through the cap B and the tube B', as shown, so that it is virtually inclosed by a jacket of hot air almost its entire length, whereby the gases passing through the tube are maintained at a high temperature. On the outer extremity of the tube F is a delivery-tube G, provided with a mouthpiece *g*, and the whole apparatus is so constructed that the mouthpiece can be used by a person lying in bed, the heater being supported on a stand X beside the bed.

Air is admitted into the drum D through a tube H, which is removably screwed into a thimble D', connecting the lower end of drum D with the casing. This tube H is closed at its outer end by a removable cap H', and at its inner end is a spider or perforated plate H², that supports the inner end of an oxygen-pipe J, projecting slightly beyond the tube and opening exterior to the casing A through the side of tube I, where it communicates with an adjustable joint J', attached to the tube I in any convenient manner.

Near the outer end of tube II are a series of perforations *h*, and on the tube over said perforations is fitted a valve-collar *h'*, provided with a series of perforations corresponding to those in the tube. By turning this collar its perforations can be caused to register with those in the tube or the latter can be entirely closed, as is evident from the drawings. This valve-collar enables the supply of air introduced into the heater to be nicely regulated.

O designates a flask containing compressed oxygen gas. The gas is allowed to escape from said flask through a pipe K, to which is connected a pressure-gage and gas-meter M, by which the pressure in the flask and the quantity of gas escaping through pipe K can be ascertained at any time when the gas-cock L is opened. Pipe K conducts the gas to a washer *k* of any suitable construction, which may be detachably secured to the flask, and from whence the gas is conducted through a pipe J² to tube J' and thence passes into the drum through chamber E and pipe F to the patient.

The flask O is made of sufficient strength to stand a very high pressure, so that a large quantity of gas can be condensed in a small compass. The flask is mounted in a cage P, which is provided with rubber gaskets *p p'* near top and bottom, whereby dangerous jarring of the flask is prevented.

In operation the jet Y is lighted and the heated products of combustion impact against the false bottom D', diverge, and pass up around the drum into cap B and out through pipe B'. The casing being internally lined with asbestos very little heat is lost by radiation or conduction, and the air-drum D becomes intensely heated and begins to escape through chamber E into pipe F, and thence to the mouthpiece, so that at each inhalation the patient imbibes highly-heated but perfectly-dry air, or air only moistened by the medicaments placed in the evaporating-tube I. The oxygen gas is turned on, the proper pressure and the amount inhaled being regulated by the indicator M, which is always visible to the operator. By adjusting the valve *h'* the amount of air introduced with the gas is regulated.

The thermometer T will indicate very accurately the temperature of the gases passing through tube F.

By this apparatus pure oxygen or air, or mixed oxygen and air, with or without vaporized medications, can be administered to the patient at any desired temperature and in any desired quantities and pressures, the whole thing being under the control of the attendant, or under the control of the patient himself, if able to sit up.

The advantages of this apparatus will be appreciated by patients and the medical profession, as it affords an absolutely reliable means for the administration of the most vola-

tile medicines and gases with perfect safety and under absolute regulation and control of the operator.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent thereon, is—

1. The combination of the casing, the air-heating drum therein, and the vaporizing-chamber connected with the air-heating drum; with the detachable heating-cap fitted on the casing and deriving its heat therefrom, and the tube extending from the vaporizing-chamber through said cap, substantially as described.

2. The combination of the casing, a heating-drum therein, gas and air inlets into said drum and means for regulating the admission of air and gas; with an auxiliary heating-chamber deriving its heat from the casing, and means for conducting the gases from said heating-drum through the auxiliary chamber without mixing with the hot air therein, substantially as described.

3. The combination of the casing a heating-drum therein, gas and air inlets in said drum, and means for regulating the admission of gas and air with vaporizing-chamber communicating with said drum, an auxiliary heating-chamber deriving its heat from the casing and a tube for conducting the gases from said vaporizing-chamber through the auxiliary heater, substantially as described.

4. The combination with the casing and heating-drum, of the tube H having perforations *h* and perforated collar-valve *h'*, substantially as described.

5. The combination with the casing and heating-drum, of the tube H having perforations *h* and perforated collar-valve *h'* and the gas-tube J leading through said tube, substantially as described.

6. The combination of the casing, the drum D therein, and the tube II communicating with said drum having a collar-valve *h'*, near its outer end and a perforated plate H' at its inner end; with the tube J secured in tube II and passing through plate H' and through the side of the tube, and the joint J' attached to the tube and connecting with pipe J, substantially as described.

7. The combination of the casing, the drum D therein, and the vaporizing-chamber E, with the removable cap B fitted on the casing, its pipe B', and the tube F connected to chamber E and passing through said cap and pipe, all substantially as described.

8. The combination of the casing, and the drum D therein having a false bottom D', with the vaporizing-chamber E communicating with said drum, substantially as and for the purpose described.

9. The combination of the casing A, the drum D therein having a false bottom D', and the detachable cap B, and a tube for conducting the gases from drum D through cap B, substantially as described.

10. The combination of the casing A, the
drum D having false bottom D', and the vap-
orizing-chamber E communicating with said
drum, with the removable cap B, its pipe B',
5 and the tube F conducting gases from cham-
ber E through said cap and pipe, and the in-
haler-tube connected to said tube F, substan-
tially as described.

In testimony that I claim the foregoing as
my own I affix my signature in presence of 10
two witnesses.

VIRGIL W. BLANCHARD.

Witnesses:

JAMES R. MANSFIELD,
ARTHUR E. DOWELL.