

- [54] **VAPORIZER VENTILATING LINE**
- [76] Inventor: **Hans Georg Breiling, Friedrichstr. 34b, Lubeck, Germany**
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- [51] Int. Cl. **B01f 3/04**
- [58] Field of Search **261/62, 63, DIG. 65; 137/625.29; 128/188**

3,420,232	1/1969	Bickford	128/188
3,534,732	10/1970	Bickford	137/625.29

FOREIGN PATENTS OR APPLICATIONS

709,638	5/1965	Canada	
682,519	11/1952	Great Britain	
696,769	9/1953	Great Britain	
814,427	6/1959	Great Britain	
1,043,110	9/1966	Great Britain	
1,104,585	2/1968	Great Britain	128/188

Primary Examiner—Tim R. Miles
Attorney—John J. McGlew et al.

[57] **ABSTRACT**

In an anesthesia vaporizer, the ventilating line has its outlet orifice positioned lower than the vaporizer control valve and the branch point between the air inlet into the vaporizer and the by-pass line to the mixing chamber. This prevents unduly enriched gas from reaching a patient during the beginning use of the vaporizer. Preferably the inlet to the ventilating line is within the container and below the control valve.

3 Claims, 1 Drawing Figure

[56] **References Cited**
UNITED STATES PATENTS

1,860,136	10/1932	Bunch	222/396
1,899,749	2/1933	Deutsch	239/143
2,388,850	11/1945	Kantor	261/DIG. 7
2,615,700	10/1952	Dixon	251/102
2,915,061	12/1959	Edmondson et al.	128/188
3,158,154	11/1964	Schreiber	128/188
3,164,149	1/1965	White et al.	137/484.4

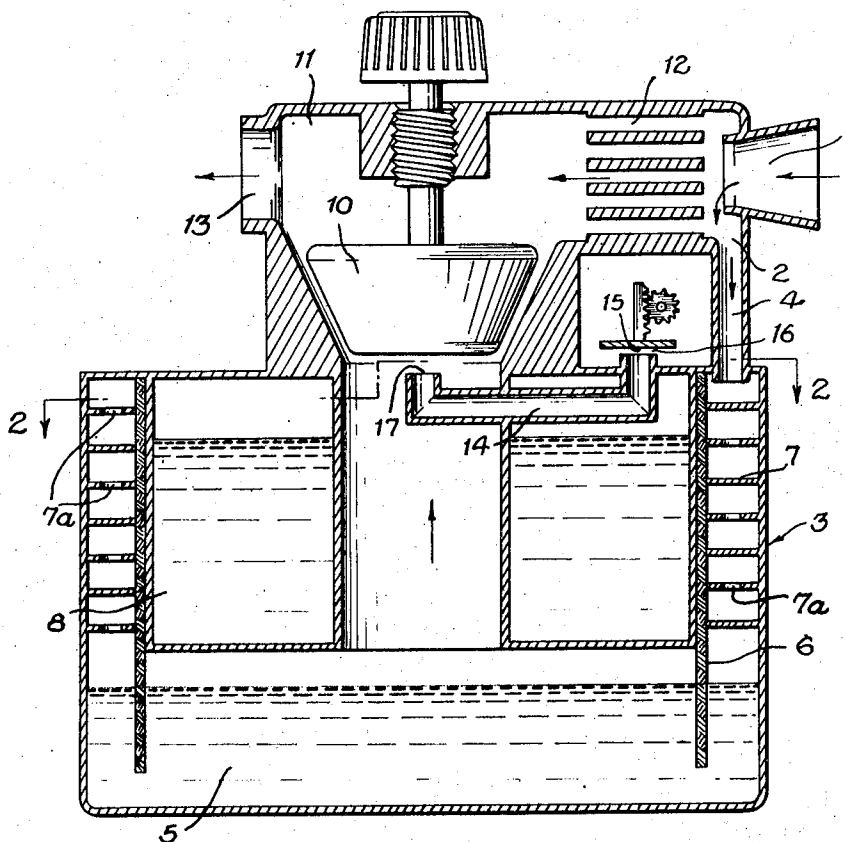


Fig. 1

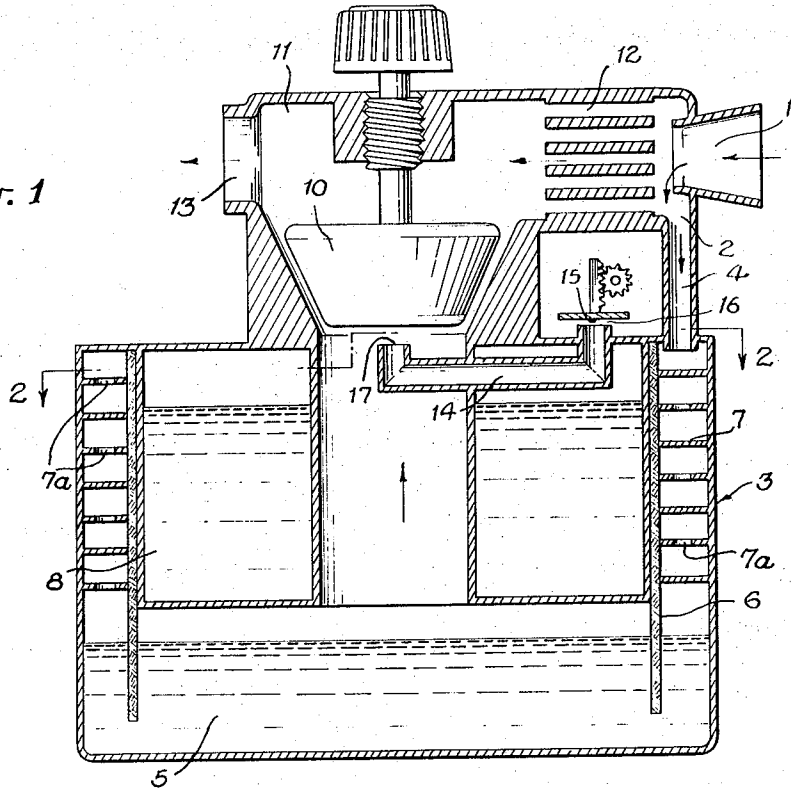
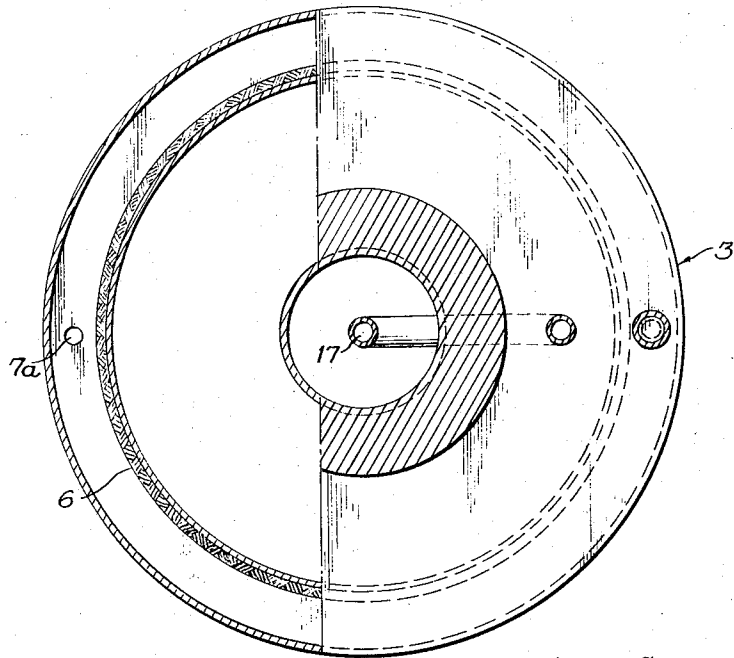


Fig. 2



INVE

Hans Georg Breili

VAPORIZER VENTILATING LINE

This is a continuation of application Ser. No. 69,928 filed Sept. 4, 1970, now abandoned.

Vaporizers are used which contain anesthesia which is liquid at normal temperatures. These vaporizers have a ventilating or air escape line which is closed when the vaporizer is being used and is opened when the apparatus is not being used. Because the ventilating line is opened during non-use, the pressures are equalized which otherwise could be changed due to temperature variations. In the existing vaporizers, the close-off valve for the ventilating line is positioned above the vaporizer control valve. This facilitates the construction and operation of the vaporizer. However, it has been observed that when the vaporizer is placed in a ready condition, it is possible that the gas flowing through the vaporizing chamber and other parts of the apparatus can be enriched up to the point of saturation so that the air or nutritional gases breathed by the patient are saturated with anesthesia vapors corresponding to the prevailing temperature. This produces the danger that, when anesthesia is begun to be administered to a patient, too much anesthesia containing vapor is given the patient.

The object of this invention is to avoid such disadvantages and to produce an anesthesia vaporizer in which in ready condition cannot produce a too high concentration of anesthesia in the gas administered the patient. This invention starts with an anesthesia vaporizer having a ventilating line closable by a valve. According to this invention, the outlet orifice of the ventilating line is positioned lower than the vaporizer control valve and below the point at which the air inlet line into the vaporizer branches from the by-pass line leading to the mixing chamber. This has the advantage in that, when the vaporizer is not being used, that is shut down, the anesthesia can only be concentrated to saturation in the vaporizer chamber and such concentration cannot occur in the other lines conducting gas. This is because the anesthesia vapor is heavier than air or the gas being used for breathing by the patient, and that it is therefore discharged into the outside air.

The means by which the objects of the invention are obtained are described more fully with reference to the accompanying schematic drawing showing a cross-sectional view through the vaporizer.

The intake air going through the inlet opening 1 of the vaporizer flows through branch 2 into the vaporizer 3 by going through pipe 4. The vaporizer container holds a liquid anesthesia 5 which is drawn up by a cylindrical wick 6. The air going through pipe 4 enters a spiral channel 7 and becomes saturated by flowing passed wick 6 with the saturation corresponding to the temperature and pressure.

A vessel 8 containing water is mounted within the vaporizer for maintaining the temperature at a constant value.

The gas enriched with anesthesia flows passed the va-

porizer metering control valve 10 which can be manually adjusted and enters mixing chamber 11. A portion of the inlet air entering opening 1 flows through a by-pass line containing a throttle 12. This throttle can be composed of a plurality of tubes. The nutrient gas mixed with the anesthesia in chamber 11 leaves the vaporizer through the outlet opening 13.

The ventilating line 14 of this invention is mounted in the interior of the vaporizer container and has a shut-off valve 15 which is closed when the vaporizer is being used and otherwise opened. In this invention, the outlet orifice 15 of line 14 lies at a lower level than the valve 10 and also lower than the branch 2 for pipe 4.

Preferably the inlet opening 17 for the line 14 is positioned adjacent the valve 10. This prevents gas which could enter the vaporizer through valve 10, which is almost impossible to close tightly, cannot unnecessarily enrich itself with the anesthesia and discharges the same into the outside air as a total loss.

Having now described the means by which the objects of the invention are obtained,

WHAT IS CLAIMED IS:

1. A vaporizer for liquid anesthesia comprising a container having a top portion with a mixing chamber and a bottom portion in communication with said top portion adapted to contain the liquid anesthesia up to a predetermined level and leaving a space thereabove in said bottom portion for vaporization of said liquid anesthesia, an inlet connected into said mixing chamber, a discharge for the mixing chamber spaced from said inlet, a bypass for said inlet connected from said inlet into said bottom portion for flow over the liquid anesthesia, a valve seat defined at the connection of said top and bottom portions, a valve in said mixing chamber movable toward and away from said valve seat for opening and closing the connection between said top and bottom portion, and a ventilating duct having one end connecting with atmosphere and an opposite end terminating in a vent opening which is closely spaced below said valve and which vents said bottom portion substantially to the level of said valve.

2. A vaporizer, according to claim 1, wherein said bypass includes means defining an annular flow passage above the liquid anesthesia level, and a wick disposed in the open bottom portion extending below the liquid anesthesia level and upwardly through said annular flow path.

3. A vaporizer according to claim 1, including a temperature regulating water vessel located within said bottom portion above the liquid level and having an inner wall defining a central upward flow passage directly below said valve, said ventilating duct extending through said flow passage and terminating in an upwardly extending portion immediately below said valve.

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