

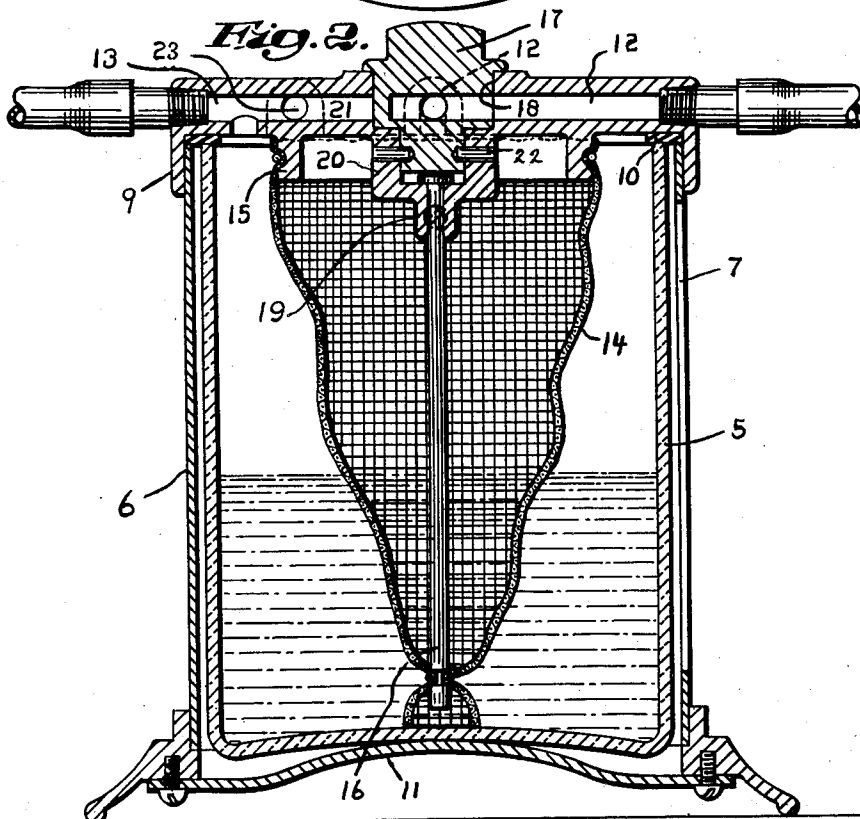
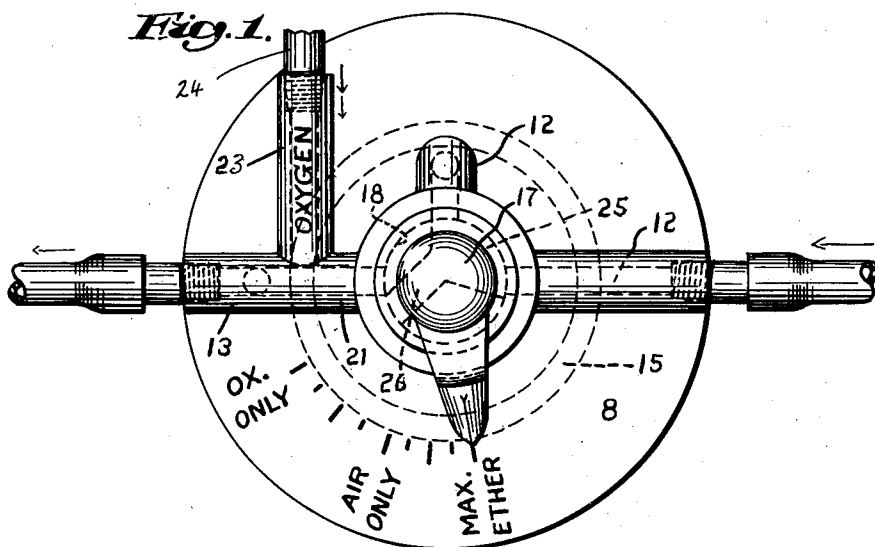
Oct. 23, 1951

J. J. RICHARDS

2,572,199

APPARATUS FOR VAPORIZING LIQUID ANESTHETICS

Filed Nov. 29, 1944



Inventor:
John J. Richards,
by **Spier, Rawlings & Spier**
Attorneys

UNITED STATES PATENT OFFICE

2,572,199

APPARATUS FOR VAPORIZING LIQUID ANESTHETICS

John J. Richards, Brookline, Mass.

Application November 29, 1944, Serial No. 565,696

1 Claim. (Cl. 261—63)

1

This invention relates to apparatus for vaporizing liquid anesthetic and particularly to valve controlled vaporizing apparatus by which the operator may quickly and easily control the proportions of either air and ether vapor or air and oxygen delivered to the patient, or effect the delivery of only air or oxygen to him. The present application is a continuation-in-part of my abandoned application, Serial No. 412,439, filed September 26, 1941.

In addition to the general requirements of apparatus for vaporizing liquid anesthetics that they be simple in construction, easy to operate, and reliable and safe to use, it is regarded as essential that such apparatus makes possible a quick and easy adjustment not only of the proportions of ether vapor and air delivered to the patient, but also a rapid shift to either only oxygen or oxygen and air.

In accordance with my invention, I provided means to close the mouth of a container for the liquid anesthetic, which means has inlet and outlet conduits in communication with the interior of the container adapted to be connected, respectively, to a source of air under pressure and to the equipment used to deliver the vaporized anesthetic to the patient. The container closing means carries a wick member disposed to extend downwardly into the anesthetic in the container and to separate the conduits from each other so that air delivered into the container passes through the saturated wick.

I also provide a conduit directly connecting the inlet and outlet conduits. Such connecting conduit and the inlet conduit are under the control of a valve adjustable to vary the proportion of air being passed into the container and being by-passed via the connecting conduit and to shut off either or both of those conduits from the source of air under pressure. I also provide the connecting conduit with a fitting to permit a conventional valve controlled oxygen source to be connected to my apparatus so that it may be used when necessary as desired, with or without air, the amount of which is controllable by the valve.

By this construction, I am able to provide simple and inexpensive vaporizing apparatus that is safe in operation and that may be quickly and easily adjusted to meet the requirements of the patient.

In the accompanying drawings, I have shown an illustrative embodiment of my invention from which these and other novel features and advantages of my invention will be readily apparent.

2

In the drawings:

Fig. 1 is a top view of apparatus in accordance with my invention for use in vaporizing an anesthetic, and

Fig. 2 is a vertical section of the apparatus of Fig. 1.

In accordance with my invention, I provide means for tightly closing the mouth of a container 5 for the ether or other liquid to be vaporized. Such means may conveniently comprise a casing 6 which may have a sight aperture or window 7 and a cover 8. The cover 8 has a downturned flange 9 adapted to be locked in any suitable manner to the casing 6. A gasket 10 between the edge of the container wall and the cover 8 ensures a tight seal that is maintained by the spring element 11 which urges the container 5 upwardly against the gasket 10.

At 12 and 13, I have indicated respectively an inlet conduit and an outlet conduit in communication with the interior of the container 5. The inlet conduit 12 is adapted to be connected to any suitable source of warmed air under pressure, not shown, and the outlet conduit 13 is adapted to be connected to any desired means, not shown, for delivering vaporized anesthetic to the patient. Supported by the cover 8 to extend downwardly into the liquid anesthetic in the container 5 is a wick element 14 disposed to separate the conduits 12 and 13 from each other so that air, passing through the container 5, must pass through the saturated wick element 14.

The wick element 14 may conveniently be in the form of a tapered sleeve, the larger end of which is attached to an annular flange 15 on the bottom surface of the cover 8 and at its lower end to the bottom part of a stem 16 preferably supported by the cover.

I form the cover 8 with a centrally disposed downwardly extending hub 18 terminating in a guide 19 in which the stem 16 is anchored. The cover 8 and the hub 18 are apertured to establish a casing, generally indicated at 20, for the valve 21. The valve 21 is rotatably attached to the cover 8 by pins 22 protruding inwardly from the hub 18 into an annular groove on the lower part of the valve 21.

I also provide the conduit 13 with an extension 23 in communication with the valve casing 20 and the extension 23 has a fitting 24 to permit any suitable source of oxygen, not shown, to be connected to my apparatus.

As may be seen in Fig. 1, the valve 21 has interconnected ports 25 and 26. The port 25 is formed so that the valve may be positioned to

3

effect the delivery of all the air into the container 5 as shown in Fig. 1. The shape of the port 25 also permits all or a desired part of the air to be delivered through the port 26 to the conduit 13. The valve 21 also permits, while blocking the flow of air into the container 5, the regulation of the volume of by-passed air or the blocking of the conduit 13. This permits a shift to oxygen and the quick and easy regulation of the proportions of air and oxygen delivered to the patient.

Apparatus in accordance with my invention has many advantages. It is inexpensive to manufacture and efficient, silent, and safe in use. My valve control makes it possible to shift the delivery, quickly and easily, between vaporized anesthetic and oxygen and likewise provides for the easy control of either the proportions of vaporized anesthetic and air or the proportions of oxygen and air.

What I therefore claim and desire to secure by Letters Patent is:

Apparatus for vaporizing liquid anaesthetic in a container for use with a source of air under pressure and with means for delivering the vaporized anaesthetic to the patient, said apparatus comprising a closure attachable to a container to seal its mouth and including an annular flange depending from its lower surface and dimensioned to enter said container in spaced relation to its mouth, a centrally disposed stem depending from said closure and being of a length to extend downwardly substantially to

4

the bottom of said container when said closure is attached thereto, a cone shaped wick member anchored at its upper end to said flange and at its lower end to said stem, and said closure having an inlet conduit to be connected to said source and opening through said lower surface inside said flange, said closure having a centrally disposed aperture establishing a valve casing with which said conduit is in communication, a vapor outlet conduit to be connected to said delivery means and opening through said surface outside said flange and including a branch in communication with said casing, and a valve plug rotatable in said casing and having passages disposed so that the proportion of air passing through said inlet conduit and said branch conduit may be varied or the flow of air through either or both of them may be blocked.

JOHN J. RICHARDS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,606,472	Keiffer et al.	Nov. 9, 1926
2,042,474	McKesson	June 2, 1936
2,085,155	Heidbrink	June 29, 1937
2,104,988	Heidbrink	Jan. 11, 1938
2,136,245	Heidbrink	Nov. 8, 1938
2,206,688	Bloomheart	July 2, 1940
2,223,456	Medsker	Dec. 3, 1940