(No Model.)

T. G. LEWIS.

CHLOROFORM MIXER.

No. 513,797. Patented Jan. 30, 1894.

Fig.1

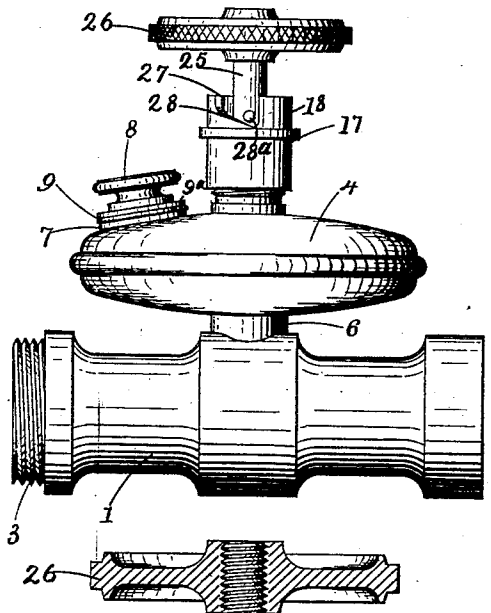


Fig.2

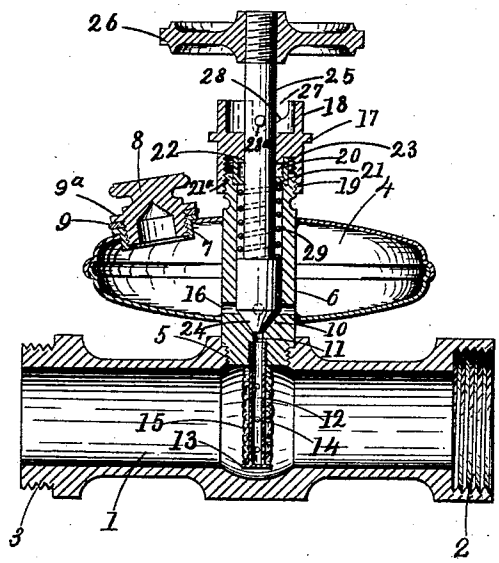


Fig.3

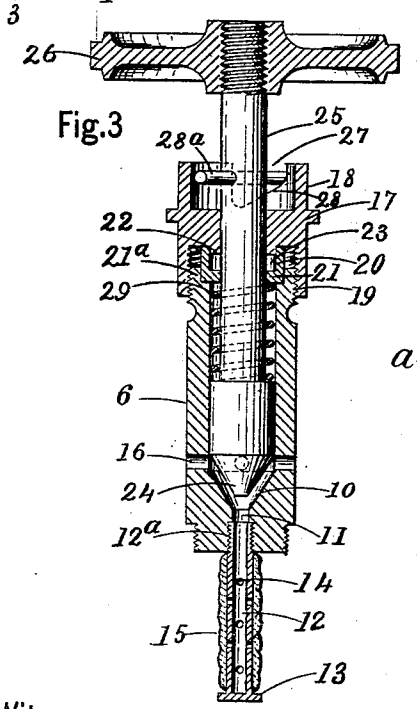
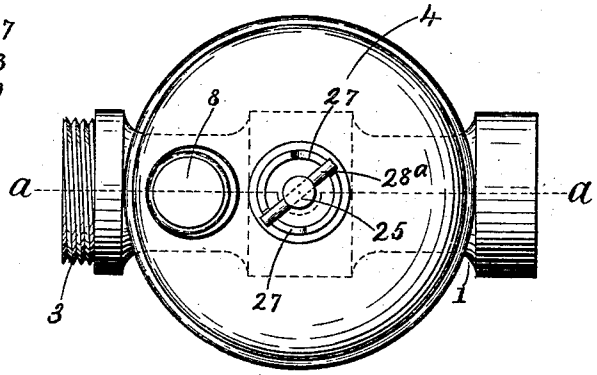


Fig.4.



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THEODORE G. LEWIS, OF BUFFALO, NEW YORK.

CHLOROFORM-MIXER.

SPECIFICATION forming part of Letters Patent No. 513,797, dated January 30, 1894.

Application filed July 8, 1893. Serial No. 479,915. (No model.)

To all whom it may concern:

Be it known that I, THEODORE G. LEWIS, a citizen of the United States, residing in Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Chloroform-Mixers, of which the following is a specification.

My invention relates to certain improvements in chloroform mixers for mixing chloroform or other anæsthetics with nitrous oxide gas, for dental purposes, and will be fully and clearly hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1, is a side elevation of my improved chloroform mixer complete, showing also the position of the hand wheel when the valve is closed. Fig. 2, is a vertical central section through the device in or about line *a a*, Fig. 4. Fig. 3, is an enlarged vertical central section through the hand wheel for operating the valve, cutting also through the cam, valve case and other parts, showing also the valve open. Fig. 4 is a top view of the device, the hand wheel for operating the valve being omitted.

The object of my invention is to produce a convenient and ready means for mixing one or more anæsthetic fluids with nitrous oxide gas and administering the same.

Referring to the drawings, 1 represents a portion of the inhaling tube through which nitrous oxide gas combined with the vapor of some anæsthetic fluid passes from the main reservoir for holding one of said gases. One end of this portion of the inhaling tube is provided with an inside screw thread, 2, by which it is removably secured to any well known main reservoir for holding nitrous oxide gas. The opposite end is also provided with an outside screw threaded portion, 3, to which any inhaling tube of well known construction may be attached in the usual and well known way.

The supplementary reservoir, 4, for holding a different anæsthetic fluid for mixing with the nitrous oxide gas that comes from the main reservoir is connected (preferably) by a screw portion, 5, (see Fig. 2) to the top of the inhaling tube so as to be easily removable when required. The screw portion, 5, forms a part of a tubular portion, 6, which passes down through the supplementary reservoir 4, and is rigidly secured to it at the top and bottom, of the reservoir so as to be gas or air tight by means of solder.

At the top of the supplementary reservoir, 4, is an inlet opening surrounded by a screw collar, 7, which is rigidly secured to the top of the reservoir in any well known way. The object of this opening is to provide an opening for supplying the reservoir with the anæsthetic when required. It is provided with a screw plug or stopper, 8, having a thin washer of leather or other suitable material, 9, located between the top of the collar and the under side of the flange, 9^a, on the screw stopper, to insure a perfectly air or gas tight joint when the stopper is screwed down in place.

The tubular portion 6, is provided near its lower end with a tapering valve seat. 10, See Figs. 2 and 3. Below the valve seat, 10, is a small hole, 11, extending through the tube, 6, and into a small perforated tube, 12, which is screwed into the bottom of the tube, 6, at the point 12^a. (See Fig. 3.) The tube, 12, is closed at the bottom and is provided with a surrounding flange, 13, at its lower end, and with a series of small perforations, 14. It is covered with cotton, 15, or other suitable absorbing material.

Just above the valve seat, 10, or at or near the top of the same, is one or more transverse openings, 16, through the tube, 6. These openings are located so as to be close to or near the bottom of the supplementary reservoir 4. Their object will appear farther on.

At the top of the tube, 6, is a removable top piece 17, having an upper projecting rim, 18, and a screw portion, 19, by which it is made easily removable in the ordinary way. Within the top piece, 17, is a removable thimble, 20, having an opening through its lower end, made smaller than the interior of the thimble so as to leave an inwardly projecting flange, 21. The object of this opening is to permit the valve stem to pass through. The lower part of the thimble, 20, fits down into a small annular depression 21^a, in the top of the tube, 6, (shown in Figs. 2 and 3) to keep it central. The inner top of the top piece, 17, is provided with a downwardly projecting rim, 22, which projects down into the top of the thim-

ble, 20, thereby leaving a space, 23, (see Figs. 2 and 3,) in which cotton or other similar packing may be placed to insure a gas tight joint between it and the valve stem. The valve, 24, is made tapering to fit the valve seat, 10. The valve stem, 25, passes up through the thimble, 20, and top piece, 17, and is provided with a small milled hand wheel, 26. The upper projecting rim, 18, is provided with two inclined cam openings, 27. These cam openings are located directly opposite each other and the inclined portion, 28, inclines downward in one direction on one side of the rim, 18, and in an opposite direction on the other side of said rim.

The valve stem, 25, is provided with a transverse pin, 28^a. This pin is secured to the valve stem by being driven through a hole in which it is fitted tightly. The pin, 28^a, projects out from both sides of the valve stem and its ends rest upon the oppositely inclined cams, so that by turning the hand wheel, 26, the valve may be lifted up from its seat, 10.

To keep the valve closed or in contact with the valve seat with a yielding pressure, a spiral spring, 29, is interposed between the top of the valve and the under side of the thimble, 20. See Fig. 2, where this is shown.

The operation of the device is simple and easily understood. The required anæsthetic fluid being placed within the reservoir, 4, and it being desired to mix a portion with a different anæsthetic or nitrous oxide gas passing through the inhaling tube, all that is required is to turn the hand wheel, 26, slightly around which operation causes the ends of the pin, 28^a, to move upward on the inclined planes 28 of the cams, 27, and thereby lift the valve, 24, up from its seat, which is instantly closed again by the spiral spring, 29, the moment the hand wheel 26, is released. This operation allows a portion of the anæsthetic fluid to pass from the reservoir, 4, through the opening 16, and from thence down into the tube, 12, and through its perforations, 14, to the cotton or absorbing material, 15, from which it vaporizes and mixes with any vapor or gas that may be in or passing through the inhaling tube, 1. The closing of the valve by a spring, enables the operator to open the valve quickly and by releasing it, to allow the spring to instantly close it. By this means a much smaller quantity of the liquid can be let into the inhaling tube than can be done in any other way. This construction is important in an apparatus of this kind and enables the operator by an easy and convenient manipulation to graduate the quantity of liquid to be let down into the inhaling tube.

If desired the camways, 27, may be dispensed with and the valve lifted by hand, by simply pulling the hand wheel, 26, (or its equivalent in the form of a knob of any suitable shape) upward thereby lifting the valve stem and valve. The spring will return the valve to its place the instant it is released. Although this construction would not answer the purpose as well as that above described it could be used without materially changing the nature of my invention.

I claim as my invention—

1. In an apparatus for administering anæsthetics, the combination of an inhaling tube, a supplementary reservoir located above the inhaling tube, a valve tube extending vertically through the supplementary reservoir and connecting with the inhaling tube, a valve located within the valve tube above the inhaling tube, means for admitting an anæsthetic thereto, and means substantially as above described for opening communication with the inhaling tube by raising the valve, and a spring for instantly closing it when released, substantially as described.

2. In an apparatus for administering anæsthetics, the combination of an inhaling tube, a supplementary reservoir located above the inhaling tube, a valve stem, and valve tube inclosing a valve and spring for holding the valve closed when released, means on the upper end of said valve stem for lifting the valve against the force of said spring and thereby opening communication with the inhaling tube, a perforated tube extending down from the lower end of the valve tube in the inhaling tube, the opening below the valve communicating with the interior of the perforated tube, and a covering of cotton or absorbent material surrounding said perforated tube, substantially as and for the purposes described.

3. In an apparatus for administering anæsthetics, the combination of an inhaling tube, a supplementary reservoir located above the inhaling tube, a valve tube carrying the valve stem, valve, and spring for closing the valve, and extending vertically through the supplementary reservoir, its lower end communicating with the inhaling tube and its upper end extending up through the top of the supplementary reservoir, means at the top of the valve tube for opening the valve against the force of the spring, consisting of two oppositely inclined cam ways, a pin passing transversely through the valve stem and having its ends resting in said cam ways, and means by which said valve may be turned so that the opposite ends of the pin will be moved up the inclined cam ways and thereby lift the valve from its seat and open communication between the supplementary reservoir and the inhaling tube, substantially as described.

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