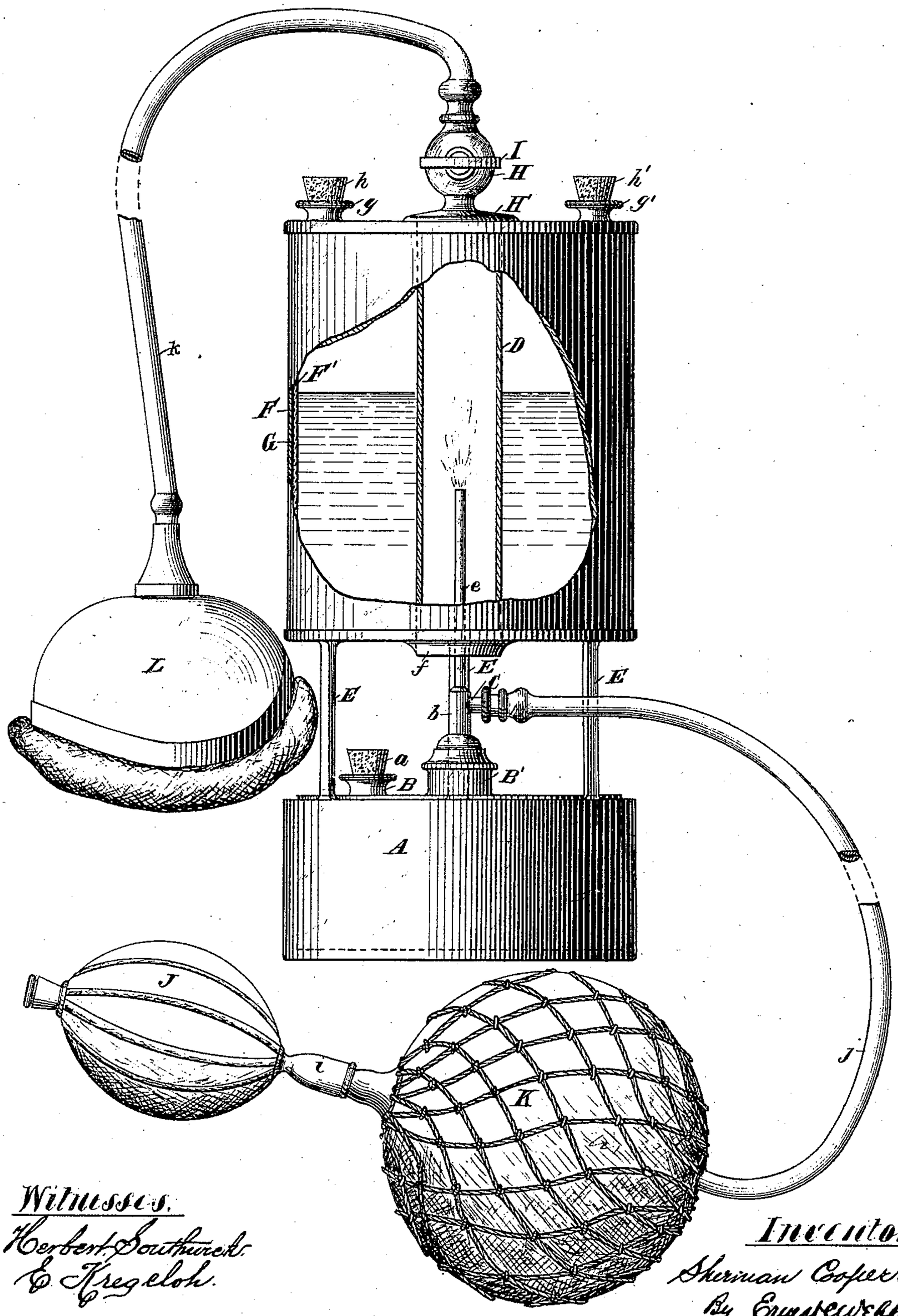
(No Model.)

S. COOPER.

APPARATUS FOR ADMINISTERING ETHER.

No. 287.098. Patented Oct. 23, 1883.



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UNITED STATES PATENT OFFICE.

SHERMAN COOPER, OF WESTFIELD, NEW JERSEY.

APPARATUS FOR ADMINISTERING ETHER.

SPECIFICATION forming part of Letters Patent No. 287,098, dated October 23, 1883.

Application filed February 1, 1883. (No model.)

To all whom it may concern:

Be it known that I, SHERMAN COOPER, a citizen of the United States, residing at Westfield, in the county of Union and State of New Jersey, have invented a certain new and Improved Process of Vaporizing and Administering Ether, of which the following is a full, clear, and exact description.

My invention relates to an improved process of vaporizing and administering ether, the object being to mix the ether with a due proportion of atmospheric air, and to discharge it at the point of application, thus mixed with air, in the form of a vapor or dry gas.

To this end my invention consists in forcing a spray of ether by means of air-pressure into a heated tube or other receptacle, whereby the ether is vaporized, and is discharged therefrom by the same pressure in the form of a vapor or dry gas. The invention also consists in suitable appliances whereby the ether can be thus vaporized and distributed, all as hereinafter fully described.

In the accompanying drawing a central view of one form of appliance for vaporizing and distributing ether is shown, the vaporizing-tube and its heating apparatus being shown in part section, and the air-pump or bellows and discharge-funnel or face-mask in elevation.

A designates a cylindrical vessel having necks B B′. This vessel, which I term the "ether-reservoir," is intended to receive the ether to be operated upon, and has a capacity of about four fluid ounces, although it may be made larger or smaller, if desired. The ether is introduced into the vessel A through the neck B, and said neck is provided with a stopper, *a*, which may be made of rubber, cork, or other suitable material, so as to close the vessel tightly. The neck B′ terminates in a tube, *b*, having an orifice near its upper end, which is closed by a tube, *c*. To the upper end of the tube *b* a smaller tube, *e*, is soldered or otherwise attached, and this tube *e* extends up through the bottom of a cylindrical vessel, supported above the vessel A by uprights E, into a tube or pipe, D, set therein, and extending through the bottom and top of said vessel. This vessel, which I term the "water-reservoir," consists of a double can, F F′, lined with paper or other non-conducting material, formed by inserting one can into another, so as to make a tight fit, and interposing between them a filling or lining of paper, G. In the bottom of these cans F F′, I form an opening which is covered by a deep cap, *f*, soldered to the bottom of the outer can, F, and the tube D extends through this opening into this cap *f*, and is soldered to the edges of the cans F F′ around said opening. The tops of the cans F F′ are provided with necks *g g′*, having suitable stoppers, *h h′*, whereby they can be tightly closed; and a central opening is also cut therein, provided with a cap, H, having a convexed base, H′, soldered over said opening. The tube D extends through this central opening into the base H′ of the cap H, and said cap has a channel-way cut therein, leading into the tube D. A plug, I, is arranged in the cap H, so that said channel-way can be opened or closed at will.

J designates an air-pump or bellows connected by a rubber tube, *i*, to an elastic bulb, K, which I term an "air-reservoir;" and *j* designates a rubber tube connecting said air-bulb K to the tube *c*.

L designates the discharge-funnel or face-mask, connected to the cap H by a rubber tube, *k*. When the ether-reservoir has a capacity of four ounces, I make the water-reservoir to hold a pint of water, and when the capacity of the ether-reservoir is increased or diminished, the capacity of the water-reservoir is to be proportionably increased or diminished.

The operation is as follows, viz: I first fill the ether-reservoir with ether, and then fill the water-reservoir with water through either of the necks, the water introduced to have a temperature of about 200° Fahrenheit, thus heating the tube D. Air is then forced into the air-reservoir K, and a gradual pressure is exerted upon the air-pump J, driving the air through the tube *j* into the tube *c*, where it acts upon the ether in the ether-reservoir, sucking it up into the tube *c*, whence it escapes into the heated tube D in the form of a spray, and is vaporized by the heated tube D. The continued air-pressure then drives the vaporized ether into the tube *k*, whence it escapes into the face-mask L in the form of a vapor or dry gas, and may then be utilized at the point of application.

I have found by practical experiments that ether will vaporize at a temperature 90° Fahrenheit; and I have also demonstrated by repeated tests that a pint of water heated to a temperature of 200° Fahrenheit will be more than sufficient to vaporize four ounces of ether introduced into the ether-reservoir at the temperature of the surrounding atmosphere, when operated upon as described.

The administration of ether by this method has many advantages, among which may be named the following, viz: concentration of the ether, so as to obtain its full strength, thereby producing anæsthesia very quickly and without loss of material by evaporation; absence of nausea and resulting vomiting after the patient recovers from the effects of the ether, which is largely due to the fact that the ether is mixed with atmospheric air and is inhaled by the patient naturally. This also tends to lessen the liability of fatal results from the administration of ether to a patient in a weak condition, and increases the rapidity of the patient's recovery from its effects.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. That improvement in the art of administering ether which consists in forcing a spray of ether by air-pressure into a heated tube, whereby it is vaporized and forcibly expelled in the form of a vapor or dry gas at the point of application, substantially as specified.

2. As a means for administering ether in the form of a vapor or dry gas, the ether-reservoir A, having a neck, B, adapted to be closed, and cap B′, terminating in a tube, *b*, which is connected to a tube, *e*, extending into a tube, D, adapted to be heated, and means for driving a current of air across said tube *b*, whereby a spray of ether is discharged into the tube D and vaporized, escaping thence in the form of a vapor or dry gas at the point of application, substantially as shown and described.

3. The combination of the ether-reservoir A and its parts, the air-forcing apparatus J K, and connecting-tubes, with the tubes *e* D, water-reservoir F F′, and applying device L, all constructed, arranged, and connected substantially as herein shown and described, for the purpose set forth.

In testimony whereof I have hereunto set my hand this 10th day of January, A. D. 1883.

SHERMAN COOPER.

Witnesses:
ARTHUR C. WEBB,
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