

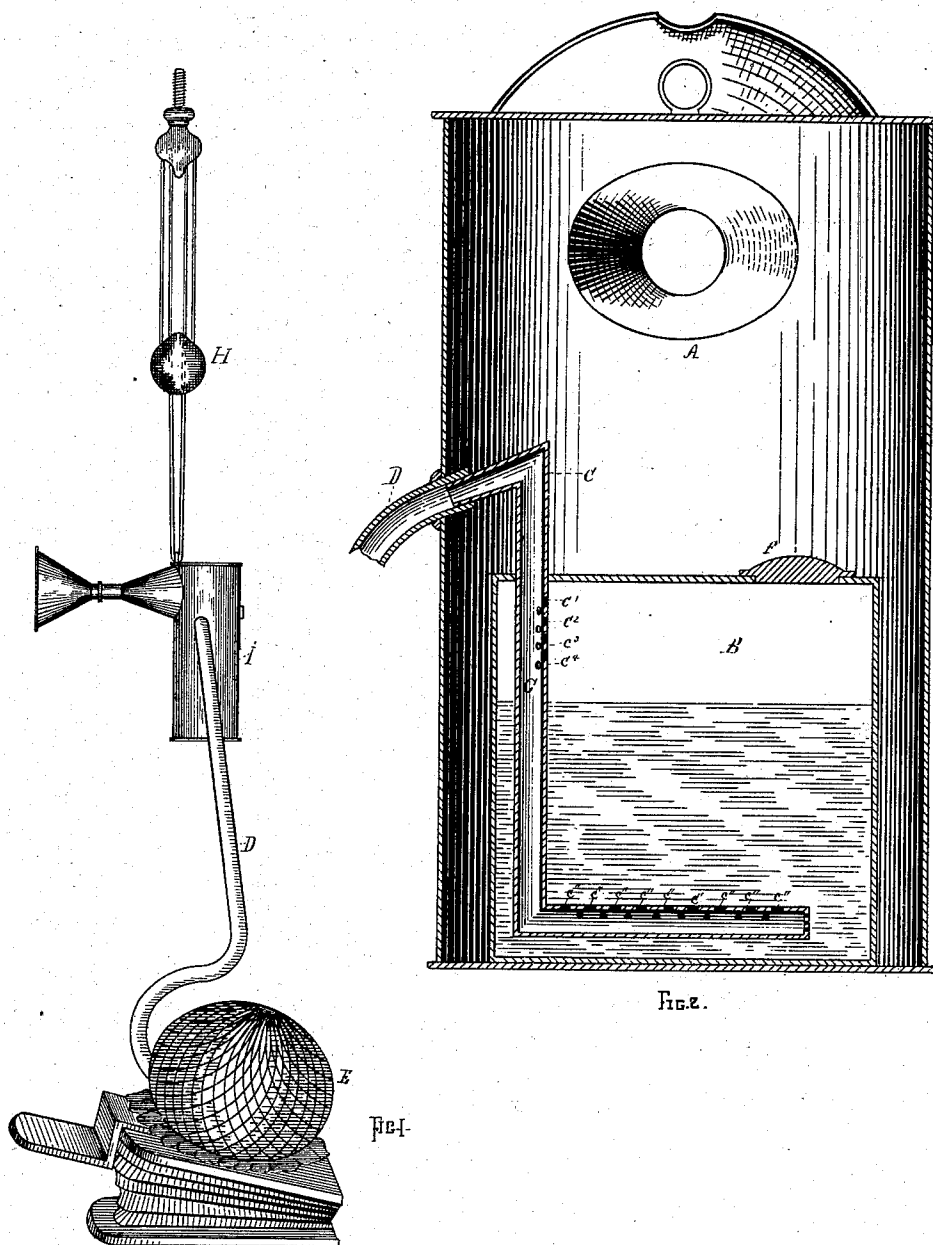
(Model.)

S. J. HAYES.

PROCESS OF AND APPARATUS FOR ADMINISTERING ANAESTHETICS.

No. 257,866.

Patented May 16, 1882.



Witnesses.
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PROCESS OF AND APPARATUS FOR ADMINISTERING ANÆSTHETICS.

SPECIFICATION forming part of Letters Patent No. 257,866, dated May 16, 1882.

Application filed March 17, 1881. (Model.)

To all whom it may concern:

Be it known that I, SAMUEL J. HAYES, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful improvements in apparatus for generating anæsthetic vapors and aerating and applying the anæsthetic elements thus developed; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 indicates my improved apparatus for generating anæsthetic vapors and aerating and applying the anæsthetic elements under pressure to the subject or patient. Fig. 2 indicates a sectional elevation of the generator and aerator.

Like letters of reference indicate like parts wherever they occur.

My invention relates, first, to a new and useful process of generating anæsthetic vapor and of aerating and applying the anæsthetic elements, which consists in placing the liquid anæsthetic in a suitable vessel or chamber and forcing currents of air into and through the liquid, and also at the same time, or simultaneously, injecting counter-currents of air into and through the vapors as formed, whereby the liquid molecules or the moisture of the vapor is disturbed and a light attenuated vapor containing the anæsthetic elements and having the necessary properties to support respiration and life is produced at the will of the administrator and in accordance with the demands or needs of the patient in the various stages of anæsthesia while being anæsthetized; and, secondly, it consists in an improved apparatus adapted to the use of this my improvement.

Heretofore, so far as I am aware, the process of passing currents of atmospheric air through a liquid anæsthetic to be inhaled, and of forcing counter-currents of air into and through the vapors thus formed, whereby the ether is more finely divided, so as to support respiration and life while producing anæsthesia and in such a manner as not to endanger health and life, has not been used or known. The old methods are objectionable in consequence of the heavy nature or quality of the

vapor administered, and its injurious or poisonous effects upon the patient.

The object of my invention is to secure a process of forced aeration by injecting currents of atmospheric air into and through liquid anæsthetics—such as sulphuric ether, chloroform, or any liquid anæsthetic—and by injecting counter-currents of air into and through the vapors thus formed, whereby the molecules of the vapor are disturbed and the heavy nature or quality of the vapor is changed to a light attenuated vapor, and at the same time to increase or diminish the supply or percentage of the anæsthetic elements or of the pure atmospheric air in order to contain the necessary properties to support respiration and life and furnish a more agreeable and desirable anæsthetic than has previously been known or in use.

I shall now proceed to describe my improved apparatus which I use in carrying out my invention, or in preparing and administering this more agreeable and desirable anæsthetic, wishing it to be distinctly understood that I do not confine the invention strictly thereto, as other mechanical appliances similar in design may be used or resorted to for the same purpose.

In the drawings, A indicates a slightly-flattened cylindrical vessel having an internal independent chamber. The chamber B is provided with a pipe, C, leading from its top down into the lower portion. The lower portion of the pipe C extends horizontally almost across the bottom of the chamber, and is provided at its base and near its upper portion with a series of perforations to admit the passage of air into the liquid placed in the lower portion of the chamber, and at the same time, or simultaneously, produce counter-currents of air to dispel the heavy vapor, or to disturb or divide the molecules of the vapor. The upper end of this pipe C is so formed that it projects laterally and receives one end of an elastic air-tube, D, which enters through the side of the exterior vessel, A. The other end of this air-tube D is connected with a foot-bellows, E, which is placed upon the floor near the operating chair. The top of the chamber B is provided with a flap-valve, F, to admit the insertion of the liquid and for the passage of the vapors in-

to the chamber of the vessel A when the pressure becomes sufficient.

If desired, the flap-valve may be dispensed with and an annular open space left upon the top of the chamber.

H indicates an adjustable hanger for the purpose of suspending the vessel A at variable heights to bring the mouth-piece on a line with the face of the patient under treatment.

The operation of my improvement is as follows: The liquid anæsthetic is charged into the vessel B, until it is about two-thirds full, through an opening, I, in the side of the vessel A. The door of the opening I is then closed, and whenever it is desired to administer the anæsthetic to the patient the mouth-piece of the chamber or vessel A is brought in line with and applied to the face of the patient and the bellows worked, the air forced under pressure from the bellows through the elastic tube D into and through the perforated pipe C into the chamber B. The currents of air arising through the liquid evaporize a portion of it, and this vapor is surcharged with counter-currents of air as it rises into the upper portion of the chamber, producing a light attenuated vapor of a pleasant and agreeable nature, and having the necessary qualities to support respiration and life. When a sufficient pressure is obtained the flap-valve F opens and this light vapor passes into the upper portion of the outer chamber, A, and from thence out of the face-piece to the patient.

In constructing the air-induction pipe C it may also, if desired, be provided with a series of perforations at its upper end to admit air-currents into the upper portion of the vessel A.

I am aware that currents of air have been forced through various liquids for the purpose of assisting evaporation, and in some cases to apply medicinal liquids, and with a spray to apply anæsthetics locally; but the ether-spray

throws a liquid spray as well as a current of air. I am not aware that it has ever been proposed to vaporize anæsthetics by the application of air under pressure and then surcharge the vapor thus produced with counter-currents of air to divide the liquid particles or molecules of the vapor, and thus deprive it of its irritating and poisonous effects upon the air-cells of the lungs and bronchial tubes, as well as in the blood, and at the same time to furnish the necessary air to support respiration and life, and thereby avoid the injurious and poisonous or disagreeable effects upon the patient.

Having described my invention, what I claim, and desire to receive by Letters Patent, is—

1. The process herein described of generating anæsthetic vapors and of aerating and applying the anæsthetic elements to the patient, which consists in charging the liquid into a suitable vessel or receiver and subjecting it to the action of a series of air-currents, and of surcharging the vapor arising therefrom with counter-currents of atmospheric air under pressure, whereby a light agreeable anæsthetic vapor having the necessary properties to support respiration and life is produced or developed and administered under pressure, substantially as herein described.

2. The vessel A, containing the chamber B, and having the perforated air-induction pipe C, substantially as set forth.

3. The combination of the vessel A with an interior generating-chamber, B, and an air-induction pipe, C, with an elastic tube, D, and an air-forcing device, constructed and arranged substantially as herein set forth.

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