

O. Wilson.

Instrument for the Administration of Nitrous Oxide.
And other Anaesthetics.

PATENTED

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Fig. 2.

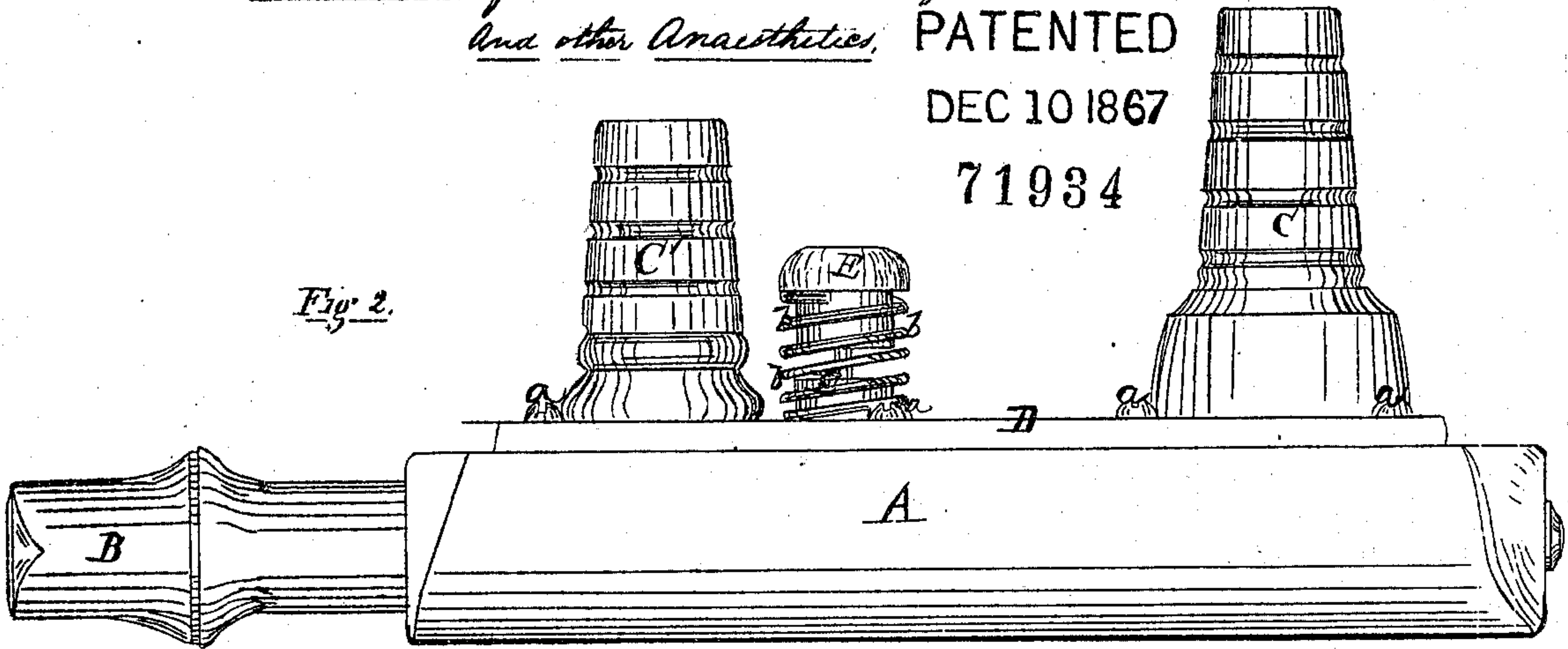


Fig. 1.

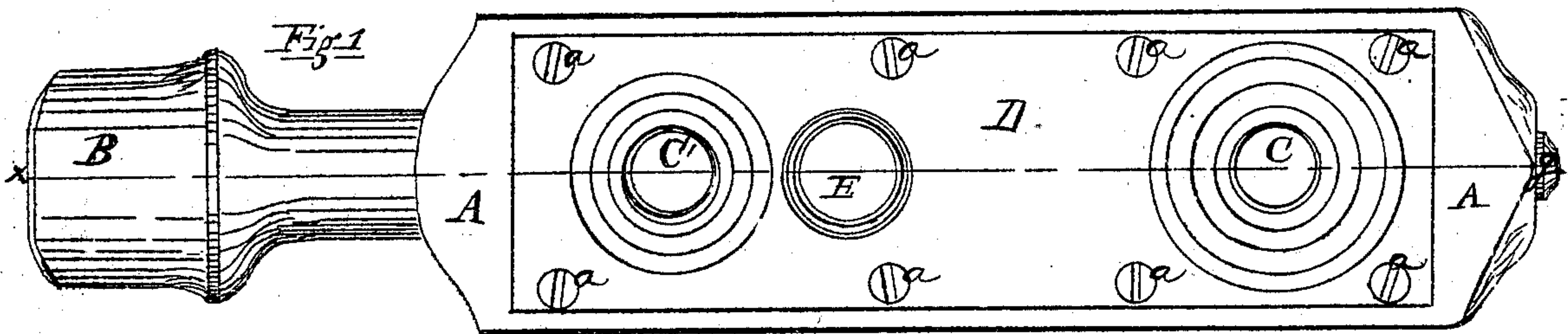


Fig. 3.

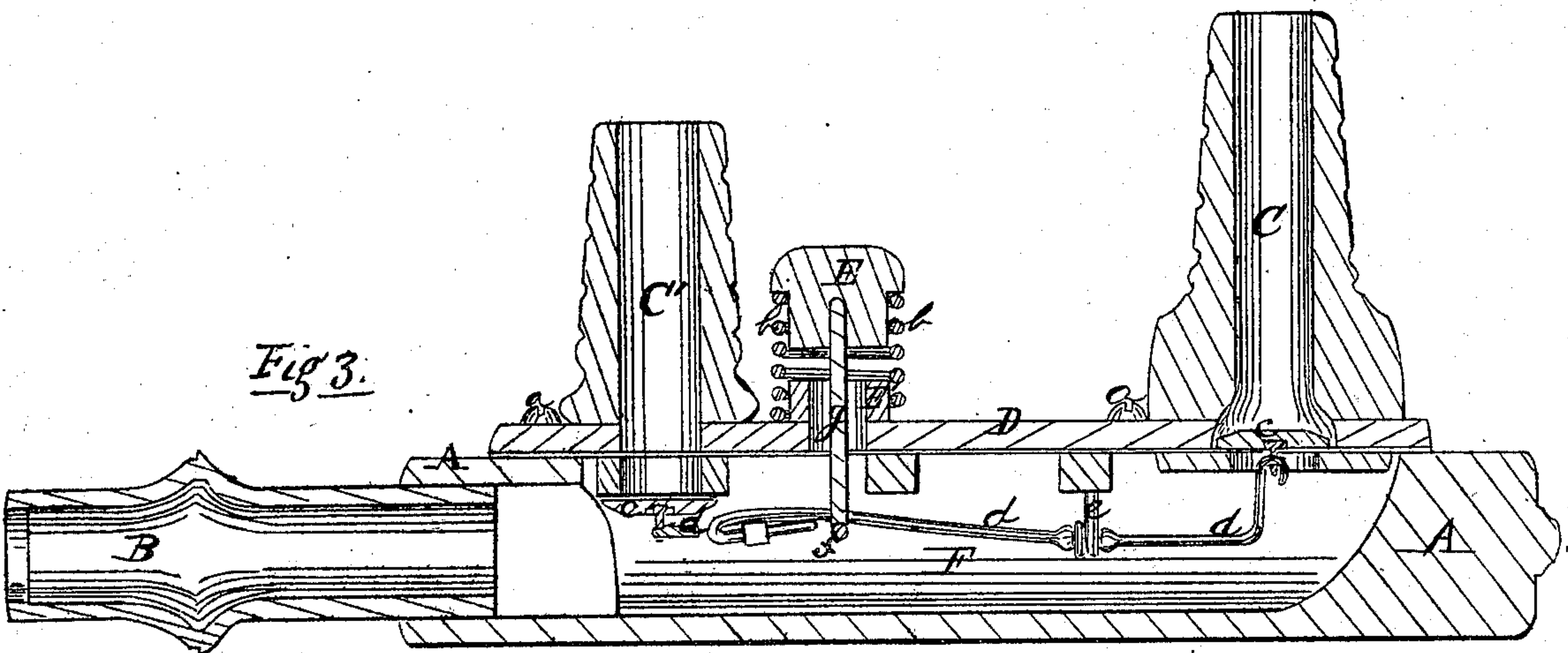
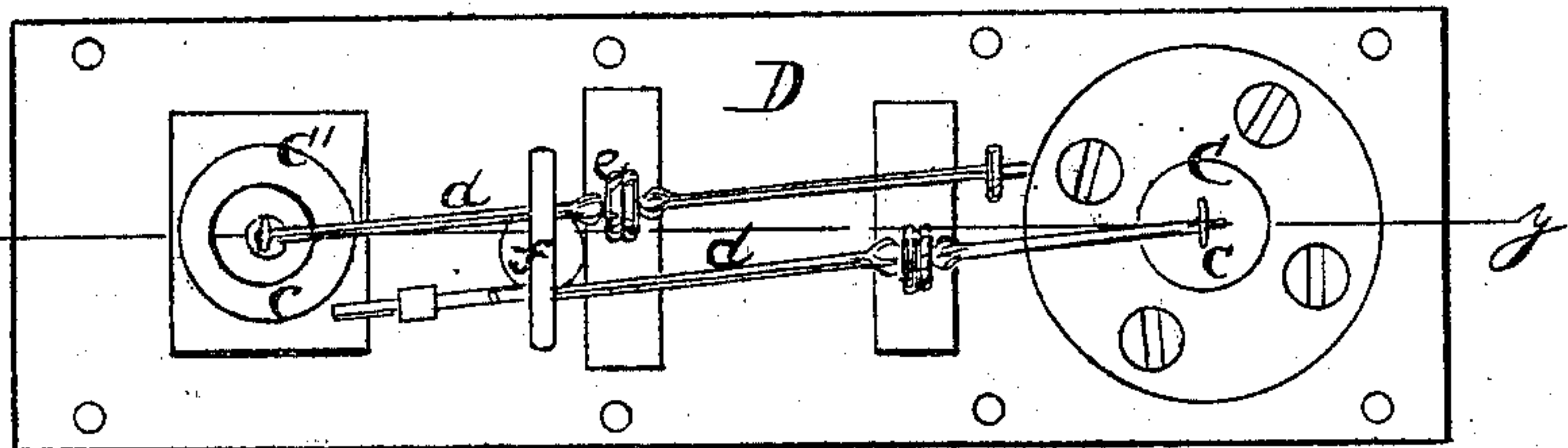


Fig. 4.



Witnesses

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OSBORN WILLSON, OF AURORA, ILLINOIS.

Letters Patent No. 71,934, dated December 10, 1867.

IMPROVEMENT IN INSTRUMENT FOR ADMINISTRATION OF ANÆSTHETICS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, OSBORN WILLSON, of Aurora, in the county of Kane, and State of Illinois, have invented a new and useful Instrument for the Administration of Nitrous Oxide and other Anæsthetics; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a plan view of the instrument.

Figure 2, a side elevation.

Figure 3, a longitudinal sectional elevation as indicated by the line taken in the plane xy of fig. 1.

Figure 4, a bottom view in detail of top plate of the instrument.

Like letters in the different figures of the drawings indicate like parts.

The nature of my invention consists in the construction of an instrument with inhaling and exhaling-tubes, provided with valves, working automatically and alternately in opening and closing the tubes by the respiration of the patient, and a spring-valve and air-tube for regulating the administration of the nitrous oxide and other anæsthetics.

To enable any one skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A is the stock of the instrument, of a suitable length and width; B, the mouth-piece; C' C, the inhaling and exhaling-tubes. These tubes are secured to a plate, D, which plate is fastened on to the ends and sides of the stock by screws a . E' is the air-tube, above which is the spring-valve E. This valve is made round like the tube, and formed with a shoulder, under which the spiral spring b , surrounding the tube and valve, comes against, so as to keep the valve up. A sufficient space is allowed between the tube and valve for the admission of air into the tube, which is shut off by pressing the valve down on the tube. The stock is made with a cavity, F, to receive the supporting and connecting parts of the tube-valves, (which will be presently described,) as well as to admit of a free communication of the tubes and air-tube with the mouth-piece. $c c$ are the tube-valves, with rods, $d d$, connecting with them, and properly balanced and supported by the fulcrum $e e$. These rods are embraced by the arm f of the rod g , attached to the spring-valve, so that on pressing down the valve the tube-valves will operate automatically and alternately in opening and closing the tubes when administering nitrous oxide and other anæsthetics.

Operation.

The patient, after being seated in the chair, with the operator to the right of him and the assistant to the left, is requested to introduce the mouth-piece of the instrument into his mouth, and breathe naturally through the same, the assistant holding the instrument. The operator now closes patient's nose, and partially encircles his lips with his thumb and fingers, to prevent his inhaling air. He is then watched by the assistant, and at a convenient opportunity, or at the proper time, the spring-valve E is pressed down on the air-tube E', shutting off the air from it, and the patient, almost without knowing it, inhales gas through the inhaling-tube C' from a reservoir properly connecting therewith, containing the gas, and exhales the gas from his lungs through the exhaling-tube C into another reservoir or gasometer, where it undergoes purification before being used again. It will be observed that as soon as the spring-valve E is pressed down, the valves $c c$, which tightly close the tubes, become released. The respiration of the patient then causes the valves to act automatically, closing and opening the tubes alternately, permitting the gas to be inhaled and exhaled through the tubes, as above described. When sufficient gas has been administered to the patient, the instrument is laid aside to enable the assistant to assist the operator, if necessary, in taking care of the patient, as sometimes, in the use of the nitrous oxide, the patient labors under a mental hallucination of mind, such as fear, misapprehension, &c.

In administering the nitrous oxide it is absolutely necessary that it should be free from other gases; consequently any inaccuracy of action in the valves by which the air is admitted would defeat a successful operation of the instrument. As not much nitrous oxide is used up in one inhalation, it being so rich in oxygen, it follows, if the air is admitted the gas will be wasted or lose its proper effect. Now, almost all valves in other instruments work by gravity, and when there is anything like force or resistance to overcome, they flutter, and hence do not close immediately; consequently air is admitted, and the effect is as above stated. And, moreover,

when the assistant drops the instrument with such valves, they do not close themselves, which is very desirable, for sometimes he must drop it instantly to look after patient, and as there is little time to close stop-cocks or arrange clamps, the gas is wasted. In my instrument all this is entirely obviated, for as soon as the spring-valve is released or let up, either during operation or when instrument is dropped, the valves will be closed immediately. Again, as the patient will sometimes experience a feeling akin to suffocation at first, by letting the spring-valve up, air will be admitted through the air-tube, and the patient will be relieved, which is better than releasing his nostrils from the pressure of the fingers, (for him to inhale the air,) as they contract a little, and do not take in the air freely, as at the mouth. As success depends much upon the exclusion of the air, emptying the lungs first will be found to contribute greatly to this result. With other instruments the gas must be turned on or off by stop-cocks, which is always inconvenient, and sometimes very difficult for the operator. Even if the patient understands (which he frequently does not) what is meant by emptying the lungs, he sometimes becomes alarmed, making it necessary for the operator to drop the instrument at once to attend to the patient. And further, in the operation of other instruments, the patient inhales and exhales into a bag containing seven or eight gallons of gas only, while in mine he inhales from a reservoir containing from forty to one hundred gallons of gas, and never breathes again the deleterious gas, it being exhaled, after its inhalation, into the gasometer for purification, when it can be made use of again.

In using chloroform or ether with my instrument, a funnel or two-mouthed bottle may be used by being inserted in the inhaling-tube. If a funnel is used, a proper lid or cork is provided, and a sponge, saturated with the chloroform or ether, is inserted inside.

The advantages of my instrument in the use of the above-named anæsthetics will be obvious. First, I attain economy in the use of the anæsthetic by preventing its evaporation from exposure to the atmosphere in the administration of it, as heretofore, consequently not only effecting a saving of the anæsthetic, but by its freedom from exposure, enable the operator to administer it freely without inhaling any of it himself. Second, by closing and opening the spring-valve, air can be admitted alternately with the anæsthetic, and thus relieve the patient of any feeling akin to suffocation. Third, by taking in the anæsthetic at the mouth instead of at the nose, will cause less irritation of mucous membrane. Fourth, by a graduated scale at remote end of jar or funnel, the operator may ascertain how much and how rapidly the patient is inhaling the anæsthetic.

Having thus fully described my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The construction of an instrument with inhaling and exhaling-tubes, provided with valves, working automatically and alternately in opening and closing the tubes by the respiration of the patient, substantially in the manner and for the purposes as herein specified.

2. Providing the instrument with a spring-valve and air-tube for regulating the administration of the nitrous oxide and other anæsthetics, substantially in the manner and for the purposes as herein specified.

3. The construction and arrangement of stock A, mouth-piece B, inhaling and exhaling-tubes C', C, plate D, air-tube E', valve E, spiral spring b, valves c c, rods d d, fulcrum e e, arm f, and rod g, substantially in the manner and for the purposes as herein specified.

OSBORN WILLSON.

Witnesses:

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