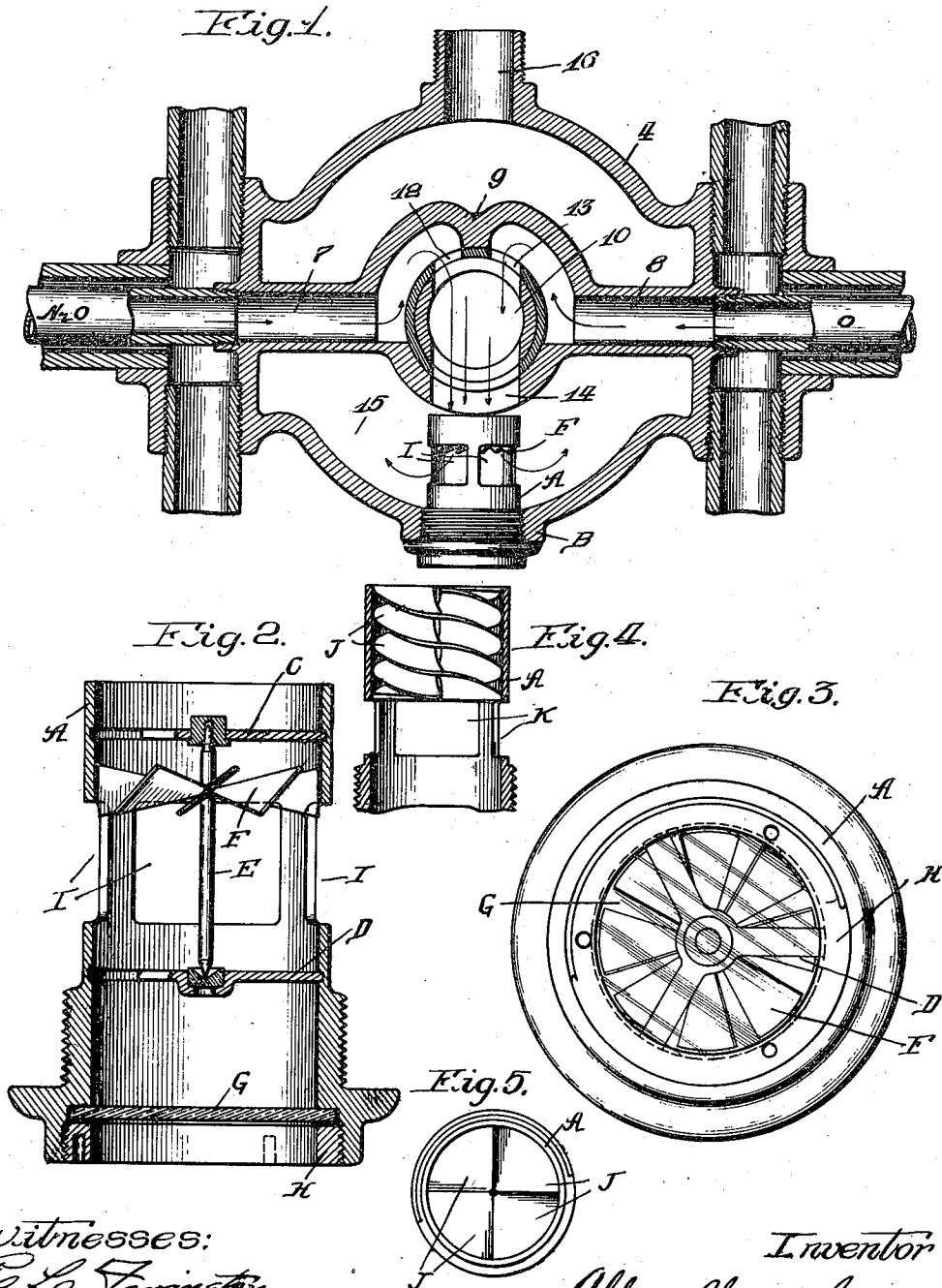


A. C. CLARK.
 DEVICE FOR MIXING GASES.
 APPLICATION FILED APR. 1, 1914.

1,156,975.

Patented Oct. 19, 1915.



Witnesses:
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UNITED STATES PATENT OFFICE.

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DEVICE FOR MIXING GASES.

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Specification of Letters Patent.

Patented Oct. 19, 1915.

Application filed April 1, 1914. Serial No. 828,649.

To all whom it may concern:

Be it known that I, ALBERT CHARLES CLARK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Devices for Mixing Gases, of which the following is a specification.

The device which constitutes the subject-matter of my present invention was devised as an improvement upon, or an attachment to an apparatus for administering a mixture of nitrous oxid and oxygen gases for producing anesthesia, such as is shown in my pending application for Patent No. 686,252, filed March 26, 1912.

The object of my invention is the provision of a compact, simply constructed and efficient device for producing an intimate physical mixing of the gases, easily applied, and the action of which can be readily observed. As is well known the gases mentioned do not enter into a chemical combination, but form a physical mixture, and it is highly desirable that the mixing shall be as complete and perfect as possible.

With the foregoing and incidental objects and advantages in view, my invention consists in the construction and arrangement of parts hereinafter described, the essential elements of which are recited in the appended claims.

It is unnecessary to an understanding of my present invention to describe in detail the entire construction of the anesthetic apparatus to which it is applied, and I have therefore illustrated in the drawing only those parts of such apparatus as are directly related to this invention.

In the drawing, Figure 1 shows a horizontal section of an apparatus such as is described in my above-mentioned prior application, with the mixing device constituting my invention applied thereto; Fig. 2 is an enlarged horizontal section of my mixing device; Fig. 3 is an end elevation of the same; Fig. 4 is a fragmental central section of a modified form of mixer; and Fig. 5 a cross section of the same.

The same letters of reference indicate the same parts in the several figures.

Referring to Fig. 1, it will suffice for an understanding of the anesthetic apparatus to which my invention is applied, to state that the casing 4 of the apparatus is pro-

vided on its interior with two passages, 7 and 8, one of which, as the passage 7, communicates with a supply of nitrous oxid and the other with a supply of oxygen. The passages 7 and 8, separated by the wall 9, are adapted to be placed in communication, through ports 12 and 13, with a large bridging port opening into the interior of a hollow plug valve 10, and thence through another large port 14 and my mixing device with the large annular chamber 15, which in turn communicates with the outlet 16 through which the mixed gases pass to the breathing apparatus. The ports governed by the plug valve 10, as will be seen by reference to the drawing, are so arranged and related that by a proper rotary adjustment of the valve, through means unnecessary to be described, either gas alone or a mixture of the gases in any desired proportion may be formed, or both gases may be entirely shut off.

My mixing device is arranged directly opposite the port 14 and in such close proximity thereto as to be directly in the path of the two streams of gas passing through the valve. The shell or case A of the mixer is flanged and screw-threaded to adapt it to seat in the boss B of the casing 4. An inner spider C and outer spider D are equipped with bearings, between which is mounted a spindle E carrying what for convenience of description I will term a screw fan F. In the present instance the outer end of the spindle is coned and rotates in a jewel bearing seated in the spider D. The shell A is interiorly shouldered near its base to receive a glass or other transparent window G, which is secured in place by a ring H screwed into the internally threaded outer end of the shell. The large openings I which are formed in the side of the shell or cage, extending from a plane adjacent the outer points of the blades of the fan outwardly, permit unobstructed passage of the mixed gases into the chamber 15.

From the description which has been given, it is apparent that the streams of nitrous oxid and oxygen passing through the mixing device will act upon the spirally inclined blades of the screw fan F to cause it to rapidly revolve, and that this rotation of the fan will operate to mingle the streams and produce an intimate mechanical mixture of the two gases.

Referring now to the modification shown in Figs. 4 and 5, the outer end of the mixing device there illustrated may be threaded and shouldered exactly like the form hereinbefore described, to adapt it to be seated in the same manner in the boss B of the casing 4. In this modification, however, the blades J, which are curved in spirally inclined form from the inner to the outer end of the cylindrical shell portion of the mixer, are secured at their outer edges to such shell, this structure creating a strong eddy or whirling movement which will cause the two gases to be effectively mixed as they pass below the blades and out through the openings K into the chamber 15 of the apparatus.

I claim:

1. In apparatus of the character described and having a casing formed with an annular chamber and central valve means for supplying different gases in a common radial stream, a cylindrical shell having a base portion seated in the outer wall of said annular chamber and a perforated central portion and an open-ended inner portion arranged to receive said stream of gases axially adjacent said valve means, and spirally inclined deflecting means arranged to produce an eddy in said stream.

2. In apparatus of the character described and having a casing formed with an annu-

lar chamber and central valve means for supplying different gases in a common radial stream, a cylindrical shell having a base portion seated in the outer wall of said annular chamber and a perforated central portion and an open-ended inner portion arranged to receive said stream of gases axially adjacent said valve means, two spider frames arranged respectively in said base portion and said inner portion, and a screw fan mounted axially of the shell in said spider frames.

3. In apparatus of the character described and having a casing formed with an annular chamber and central valve means for supplying different gases in a common radial stream, a cylindrical shell having a base portion seated in the outer wall of said annular chamber and a perforated central portion and an open-ended inner portion arranged to receive said stream of gases axially adjacent said valve means, a transparent window closing the outer end of said base portion, two spider frames arranged respectively in said base portion and said inner portion, and a screw fan mounted axially of the shell in said spider frames.

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Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."