A. C. CLARK.

ANESTHETIC APPARATUS.

APPLICATION FILED NOV. 15, 1915.

**1,173,172.** Patented Feb. 29, 1916.

Fig. 1.

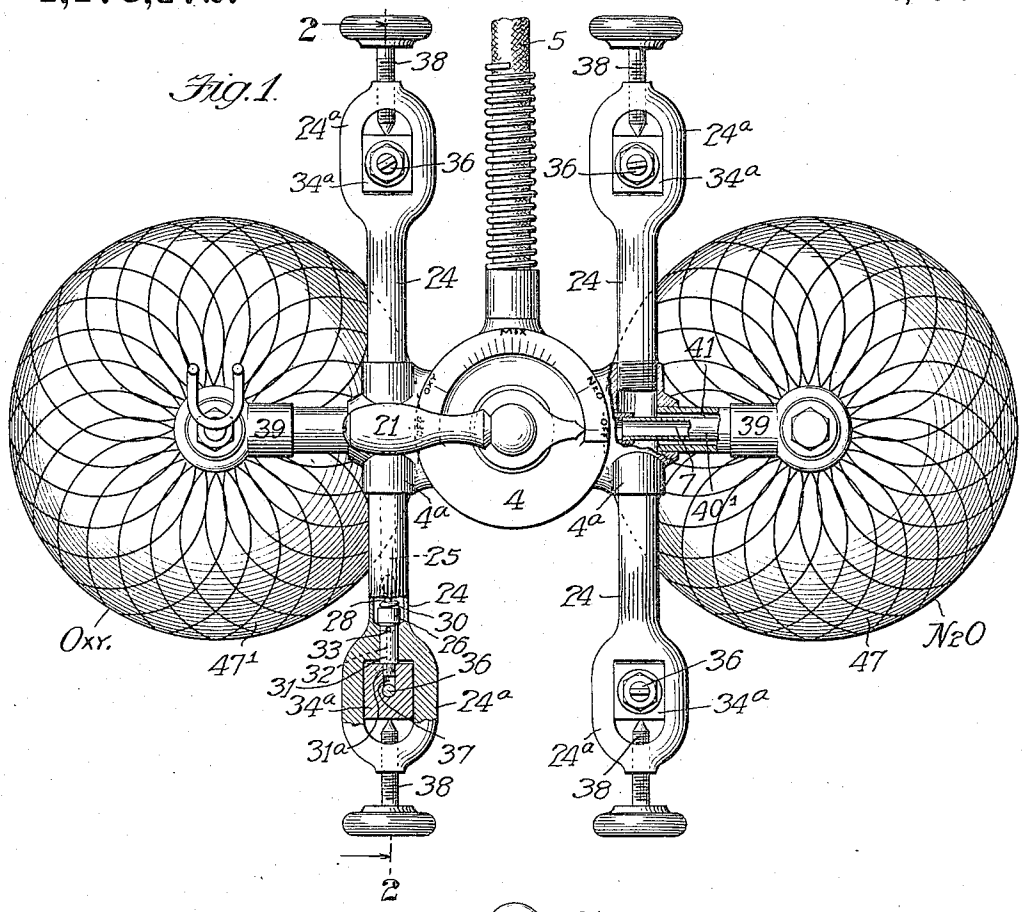
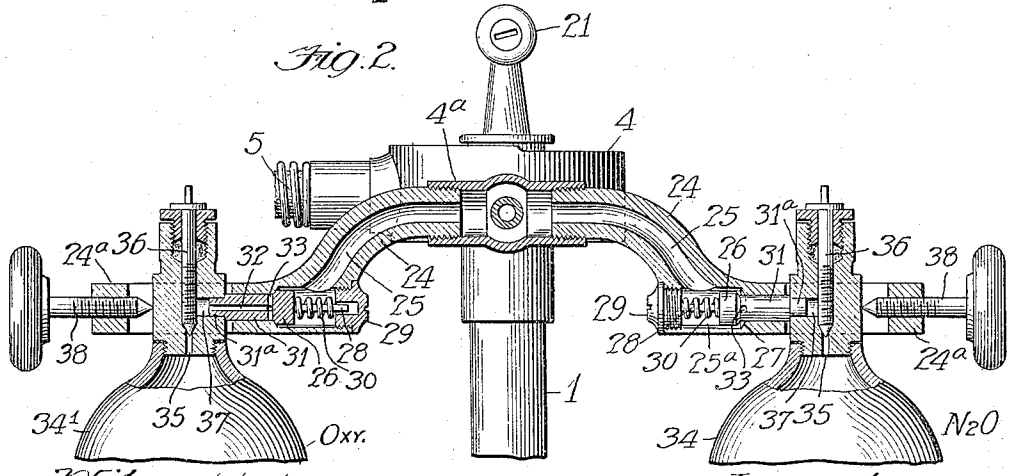



Fig. 2.




Witnesses
Martin H. Olsen.
Robert Dobberman

Inventor.
Albert Charles Clark
By Rector, Hibben, Davis & Macauley
His Atty's

THE COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

ALBERT CHARLES CLARK, OF CHICAGO, ILLINOIS.

## ANESTHETIC APPARATUS.

1,173,172. Specification of Letters Patent. Patented Feb. 29, 1916.

Original application filed March 26, 1912, Serial No. 686,252. Divided and this application filed November 15, 1915. Serial No. 61,506.

*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 Anesthetic Apparatus, of which the following is a specification, this application for patent being divisional of an original application filed by me on March 26, 1912, Serial No. 686,252.

My invention relates to apparatus for administering a gas or a mixture of gases, such as oxygen and nitrous oxid, for producing anesthesia or partial anesthesia known as analgesia and the object of my present invention is to dispense with the usual hand operated valves for opening and closing communication between the gas cylinders and the gas apparatus or machine and to provide in lieu thereof valve mechanisms which are operated automatically and as an incident to the act of attachment of the cylinders in place upon the gas apparatus or their detachment therefrom, with the result that such a valve mechanism is opened automatically when its gas cylinder is attached to the apparatus and is closed automatically when said cylinder is detached therefrom.

The same figures of reference are used in the present application as in the original application in so far as the same are applicable.

In the drawings Figure 1 is a plan view of my apparatus or machine embodying my invention, and Fig. 2 a section on the line 2—2 of Fig. 4.

Referring to the apparatus illustrated in the drawings, the mechanism including the arms or brackets for supporting the cylinders and gas bags and also the main valve mechanism are carried at the upper end of a vertical post 1 which is of such height that the valve mechanism which supports it shall be within easy and convenient reach of the operator. Upon the top of this post is mounted a casing 4 within which is arranged a single valve mechanism (not shown) operated by the handle 21. This casing is provided with two extensions $4^a$ on diametrically opposite sides thereof for the purpose of receiving and supporting a series of arms 24 which support at their outer ends gas cylinders. The valve casing is provided with an outlet with which communicates the gas administering hose 5.

Each of the extensions $4^a$ of the valve casing constitutes a means of attachment and support for the similar arms 24 having passages 25 which while communicating at their inner or adjacent ends, as seen in Fig. 2, do not communicate directly with the supply passage 7 extending into the valve casing but only indirectly, that is, through the medium of its gas bag hereinafter described. At the outer end of its passage 25 is a valve mechanism of automatic character, and as the construction of all of these automatic valve mechanisms are the same a description of one will apply to all of them. The valve mechanism comprises a valve 26 tending to seat upon its seat 27 with a yielding pressure. This valve and its seat are located in a chamber $25^a$, forming substantially a continuation or enlargement of the passage. The valve has an inwardly extending stem 28 received and guided by a central bore in a screw plug 29 which screws into and closes the inner end of such valve chamber. A coiled spring 30 encircles this valve stem, abutting at one end against the screw plug and at the other end against the valve 26, thereby holding the latter on its seat with a yielding pressure. The other or outer end of the valve is provided with a tubular extension or stem 31 fitted to slide within a bore at the extreme outer end of the arm 24. This stem has a longitudinal passage 32 communicating at its inner end with a port or ports 33 immediately in front of the valve proper. It is evident that when the valve is forced back off its seat a communication is established through the passage 32 and into the valve chamber $25^a$ and thence into the passage 25. The outer end of each arm or bracket 24 is formed as a closed yoke $24^a$, the opening being arranged to receive the head $34^a$ of a gas cylinder 34. This cylinder head is provided with an outlet passage 35 which is governed by the usual needle valve 36 and such head is also provided with a passage 37 opening laterally of such head and arranged at right angles with the passage 35. When the valve 36 is opened, the supply of gas in the cylinder flows from the passage 35 to the passage

37. This latter passage is adapted to receive the outer end 31ª of the valve stem 31, which end is reduced and of such size as to fit accurately in the passage 37. When the valve 26 is seated, the stem 31, and likewise its reduced end 31ª, extend outwardly within the yoke opening. When a cylinder is to be attached, the head thereof is inserted in this yoke opening, with the reduced end 31ª fitting in the passage 37, after which the set screw 38 is screwed inwardly against the outer side of the cylinder head, with the result that the entire cylinder is forced inwardly and with the further result that the valve is moved in the same direction and concentrically of its seat against the tension of its spring, it being understood that the cylinder head bears against the shoulder formed between the reduced ends 31ª and the valve stem 31.

In Fig. 2, the cylinders are shown in place with the righthand cylinder in position to open and hold open the valve 26 and with the lefthand cylinder in place but in a position to open the valves. The righthand cylinder is therefore being utilized for the gas supply while the other cylinder is held in reserve.

According to the present illustration, the two righthand cylinders 34 are nitrous oxid cylinders and the two lefthand cylinders which are marked 34′ to distinguish them from the other pair of cylinders, are oxygen cylinders.

Referring next to the gas bag device and the means of communication between the supply, such as the cylinders and the valve casing, the extensions 4ª also serve as means of attachment and support for tubular arms 39 from which depend respectively the nitrous oxid bag 47 and the oxygen bag 47′. As the particular construction and arrangement of the passages through these arms 39 into the gas bags and therefrom to the valve casing 4 constitute no part of my present invention it will be sufficient to say that the passages 25 communicate with passages 41 in the arms 39 and which latter passages extend to the gas bags by separate openings. Through tubes 40′ the gases pass to the valve casing wherein they are controlled and mixed by the valve therein.

It will be understood that when a reserve cylinder is employed all that is necessary to be done is to remove the empty cylinder whereupon its inlet valve 26 automatically closes, and to thereupon force the reserve cylinder in place by screwing up the hand wheel or set screw 38 which automatically brings this cylinder into communication with the gas apparatus by forcing the valve 26 off its seat.

I claim:

1. In an apparatus of the class described, the combination of an arm having means for holding a gas cylinder and also having a gas passage, a normally closed valve located in said arm for governing said passage and arranged to be automatically opened by the act of attaching a cylinder to the arm.

2. In an apparatus of the class described, the combination of a valve casing having a gas inlet port and an outlet port, a valve governing said ports, an arm connected at its middle portion with said casing and having passages communicating with said inlet port, said arm having at its opposite ends means for the attachment of gas cylinders, and normally closed valves located in said arms for governing said passages and arranged to be automatically opened as an incident to the attachment of the gas cylinders.

3. In an apparatus of the class described, the combination of an arm having means for attachment of a gas cylinder and having a gas passage, and a normally closed valve located in said passage for governing the same and having a stem provided with a passage and extending extraneous of the arm, said stem being arranged to connect with the gas cylinder and to be moved to open the valve as an incident to the attachment of the cylinder to the arm.

4. In an apparatus of the class described, the combination of an arm terminating in a yoke arranged to receive a gas cylinder and having a gas passage emerging therefrom as a port at the inner end of the yoke, and a valve located in the arm and normally closing the passage therein, said valve having a stem projecting through said port and having a passage adapted to connect with the gas cylinder.

5. In an apparatus of the class described, the combination of an arm terminating in a yoke arranged to receive a gas cylinder and having a gas passage emerging therefrom as a port at the inner end of the yoke, a valve located in the arm and normally closing the passage therein, said valve having a stem, and means arranged at the outer end of the yoke to force the cylinder and valve stem inwardly of the arm to thereby open the valve as an incident to the attachment of the cylinder.

ALBERT CHARLES CLARK.

Witnesses:
LOUIS B. ERWIN,
ROBERT DOBBERMAN.

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