A. C. HUNT.

BLOOD REMOVING AND ETHERIZING APPARATUS.

APPLICATION FILED DEC. 11, 1919.

1,349,766.

Patented Aug. 17, 1920.

2 SHEETS—SHEET 1.

Fig. 1.

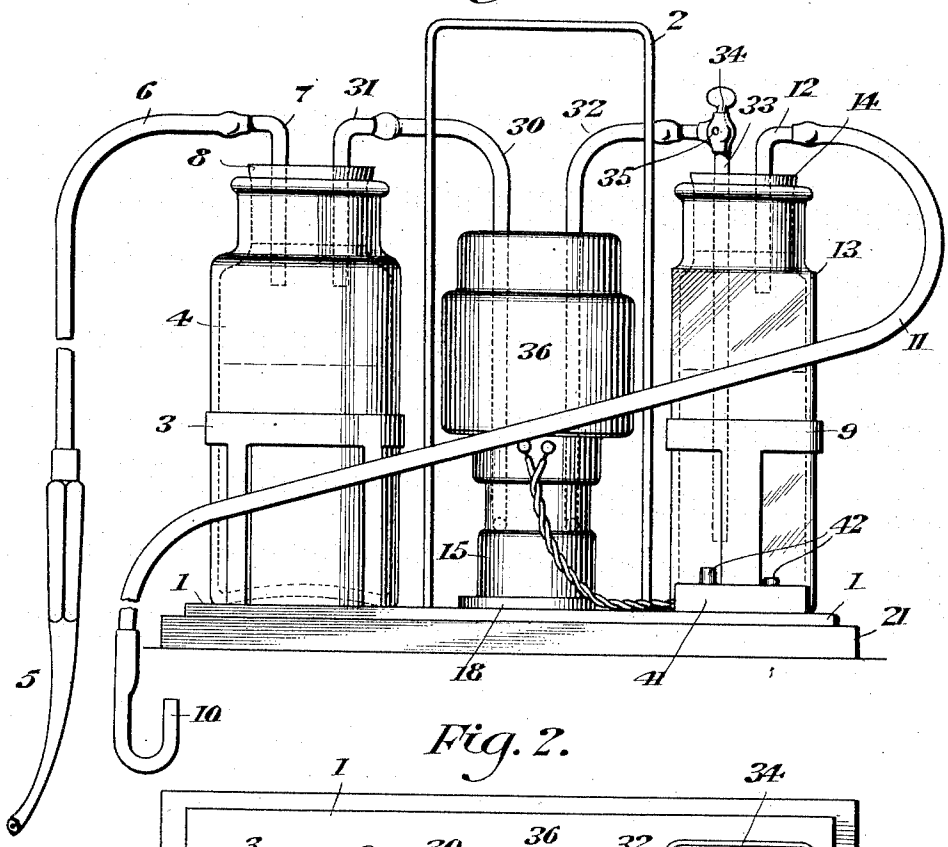
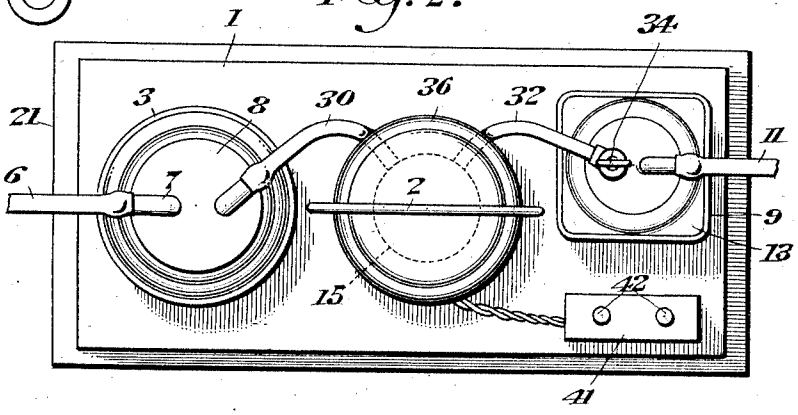


Fig. 2.



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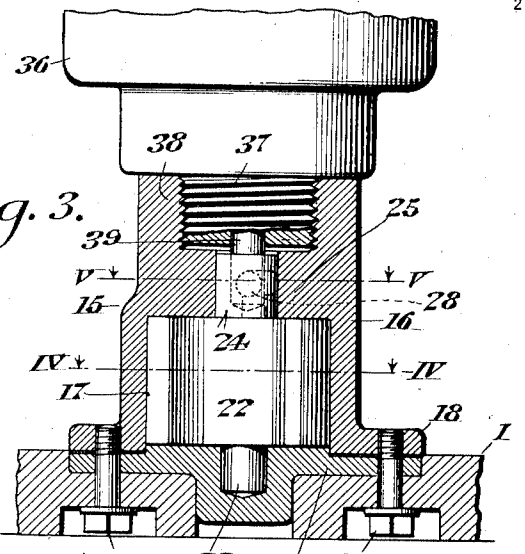


Fig. 3.

Fig. 4

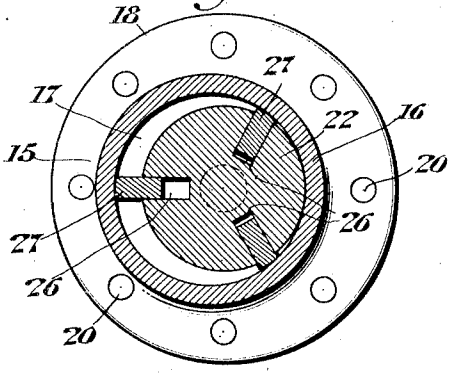
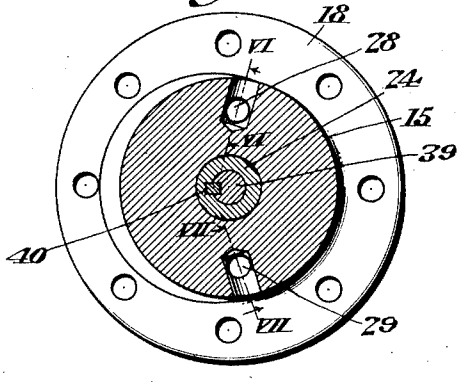


Fig. 5



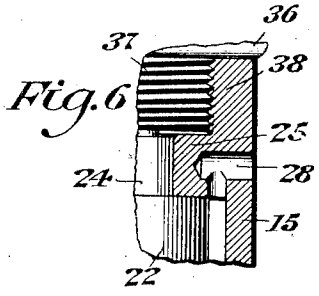


Fig. 6.

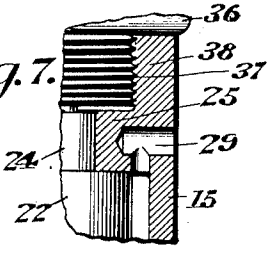


Fig. 7.

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UNITED STATES PATENT OFFICE.

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BLOOD-REMOVING AND ETHERIZING APPARATUS.

1,349,766. Specification of Letters Patent. Patented Aug. 17, 1920.

Application filed December 11, 1919. Serial No. 344,072.

To all whom it may concern:

Be it known that I, ALMA C. HUNT, a citizen of the United States, and resident of the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Blood-Removing and Etherizing Apparatus, of which the following is a specification.

In certain surgical operations, such as removing tonsils, it is necessary to use some form of apparatus for removing the blood and pus from the throat of the patient and at the same time to administer ether or other anesthetic. It is one of the main objects of this invention to provide a simple, light, compact and efficient apparatus for this purpose.

Another object of the invention is to provide a very simple, compact, and efficient rotary air compressor and electric motor for operating the same. It is very essential in apparatus of this kind that the air compressor be so constructed and arranged that the oil used therein for lubricating purposes shall not pass with the air into the ether bottle or container. It is also essential that the oil used for lubricating the air compressor shall not pass into the electric motor. In the arrangement of the air compressor and electric motor described herein these two objections are avoided, the air compressing chamber being so arranged with respect to the motor and the intake and outlet from said compressing chamber being so arranged, that oil cannot pass with the air to the ether container.

There are other objects and advantages of the invention, which will appear hereinafter.

In the drawings:

Figure 1 is a side elevation of the apparatus;

Fig. 2 a plan view thereof;

Fig. 3 a vertical sectional view of the air compressor showing the means for mounting the electric motor thereon and for connecting the motor shaft with the compressor shaft;

Fig. 4 a horizontal sectional view of the air compressor taken on the line IV—IV of Fig. 3;

Fig. 5 a similar view taken on the line V—V of Fig. 3;

Fig. 6 a detail vertical sectional view through the intake of the compressing chamber on the line VI—VI of Fig. 5; and

Fig. 7 a similar view taken through the outlet from the compressing chamber, and on the lines VII—VII of Fig. 5.

Referring to the various parts by numerals, 1 designates the base of the machine provided with a large upstanding bail 2 which serves as a handle by means of which the apparatus may be readily moved. On the base is arranged a suitable rigid holder 3 adapted to receive bottle 4 designed to receive the blood and pus drawn into it through the suction tip 5, tube 6 and discharge pipe 7 which enters the bottle through the closure 8. On the other end of the base is mounted a rigid holder 9 adapted to receive an ether bottle 13 to which is connected an etherizing tip 10 by means of a tube 11 and a pipe 12 which enters the top of the ether bottle through the closure 14.

Mounted centrally on the base between the two holders 3 and 9 is a vertically arranged air compressor 15. This air compressor consists of the main body portion 16 formed at its lower end with an eccentrically arranged compression chamber 17. The lower end of the body part of the air compressor is formed with a horizontal annular flange 18 which is adapted to rest upon a closure plate 19 mounted in the base of the machine. Bolts 20 rigidly secure these two parts together and to the base plate of the machine as clearly shown in Fig. 3. The base 1 of the machine is preferably mounted upon a suitable supporting plate 21. In the compressing chamber is mounted a rotor 22 of the compressor, said rotor being provided with a depending journal 23 fitting in a recess in the plate 19. The rotor is also provided with an upwardly extending vertical stub-shaft 24 which is journaled in a bearing formed in the horizontal cross wall 25, said wall forming the top of the compressing chamber. The rotor 22 is cylindrical and its bearings are eccentrically arranged with respect to the compressing chamber, as clearly shown in Fig. 3. The rotor is provided with three vertical radial slots 26 in which operate slidable compressing ribs or veins 27 the outer edges of said ribs bearing on the interior of the compressing chamber. The compressing chamber is provided with an inlet port 28 and an outlet port 29 both of said ports being formed in the upper wall 25 of the compressing chamber. The inlet or intake 28

is connected by tube 30 to a pipe 31 which extends through the closure 8 into the receiving bottle 4. The outlet 29 is connected by a tube 32 to a pipe 33 which extends through the closure 14 of the ether container 13, said pipe 33 extending to a point near the bottom of the container so as to be always below the level of the ether therein. This pipe 33 is provided with a valve 34 which when closed prevents air passing into the ether bottle and allows it to pass out through the discharge orifice 35. The discharge pipe 12 of the ether container, takes the ether vapor from the top of the container, as shown clearly in dotted lines in Fig. 1.

On the upper end of the body of the compressor 15 is mounted an electric motor 36. The motor casing is formed with a threaded extension 37 which is adapted to fit in a threaded socket 38 formed in the top of the compressor casing, said threaded socket being concentric with the journal 24 of the rotor 22 so that the motor shaft is axially in line with the vertical shaft of the rotor, and the motor is directly and rigidly supported by the compressor casing. The motor shaft 39 extends through the threaded extension 37 and is provided with a key 40 which is adapted to fit in a companion key-way formed in the stub-shaft 24 of the rotor so that in assembling the parts the motor is screwed into the upper end of the compressor casing and then the rotor is placed in position in the compressor casing, key 40 of the motor shaft being brought to fit within the companion key-way formed in the shaft of the rotor. The bottom plate 19 is then placed in position and the assembled parts then bolted to the base plate 1. When the parts are secured together the compressor casing is sealed at its bottom and forms a closed oil chamber. In rotary pumps or compressors of the kind illustrated it is necessary to place a small quantity of oil in the compressing chamber so that the slidable compressor veins will be thoroughly lubricated. It is important, however, that this oil shall not be passed with the air over into the ether bottle. For this reason the intake and outlet ports are formed in the upper wall of the compressing chamber. I have found in the practical operation of these machines that the oil will not be taken up by the air when the ports are arranged as shown and described and that therefore there will be no oil passing over into the ether bottle. It is manifest that by arranging the motor directly on the top of the body of the compressor there is no danger of oil from the compressing chamber reaching the motor shaft and the motor armature. It is clear that by screwing the threaded extension 37 into the threaded socket in the top of the compressor casing the motor shaft will be accurately alined with the rotor shaft and will maintain its alinement. There can be no disconnection between the motor shaft and the rotor without a complete dismantling of the machine.

The motor is controlled by a switch 41 provided with the usual circuit controlling buttons 42 connected to a suitable source of current.

What I claim is:

1. An apparatus of the class described comprising a receiving container, a suction tip connected thereto, an ether container, an etherizing tip connected thereto, a rotary air pump provided with a vertical shaft and a horizontally moving rotor, a pipe connecting the air pump intake to the receiving container, a pipe connecting the air pump outlet to the ether container, an electric motor supported directly upon the upper end of the air pump and provided with a vertical motor shaft, and means for slidably connecting together the lower end of the motor shaft and the upper end of the air pump shaft.

2. An apparatus of the class described comprising a receiving container, a suction tip connected thereto, an ether container, an etherizing tip connected thereto, an air pump casing formed with a compressing chamber, a rotor in said chamber, a vertical shaft carried by said rotor and extending upwardly through the top wall of the compressing chamber, a threaded socket formed in the upper end of the pump casing, an electric motor formed with an exterior supporting casing, a threaded extension on the lower end of said casing adapted to fit the threaded socket in the pump casing, a vertically arranged motor shaft adapted to be slidably connected to the upper end of the rotor shaft, a removable plate closing the lower end of the compressing chamber, an intake pipe connecting the receiving container to the compressing chamber through the upper wall thereof, and an outlet pipe connecting the ether container to the compressing chamber through the upper wall thereof.

3. The combination of the vertically arranged air pump casing formed with a compressing chamber at its lower end, a horizontally movable rotor within said compressing chamber and provided with a vertically extending shaft, a threaded socket being formed in the upper end of the pump casing concentric with the shaft of the rotor, an electric motor provided with an exterior supporting casing formed with a threaded extension on its lower end adapted to be screwed into the threaded socket of the pump casing, a motor shaft vertically arranged and extending below the motor casing, means to slidably connect the motor shaft with the pump shaft, and a plate closing the lower end of the compressing chamber and serving to hold the rotor shaft in engagement with the motor shaft, the pump casing being

formed with inlet and outlet ports through the upper wall of the compressing chamber.

4. An apparatus of the class described comprising a receiving container, a suction tip connected thereto, an ether container, an etherizing tip connected thereto, an air pump casing formed with a compressing chamber, a rotor in said chamber, a vertical shaft carried by said rotor and extending upwardly through the top wall of the compressing chamber, a socket formed in the upper end of the pump casing, an electric motor formed with an exterior supporting casing, an extension on the lower end of said casing adapted to fit the socket in the pump casing, a vertically arranged motor shaft adapted to be slidably connected to the upper end of the rotor shaft, a removable plate closing the lower end of the compressing chamber, an intake pipe connecting the receiving container to the compressing chamber through the upper wall thereof, and an outlet pipe connecting the ether container to the compressing chamber through the upper wall thereof.

In testimony whereof I hereunto affix my signature.

ALMA C. HUNT.