Oct. 27, 1931. E. KAISER 1,829,144

ASPIRATING AND EMBALMING DEVICE

Filed Jan. 18, 1930 2 Sheets-Sheet 1

Fig. 1.

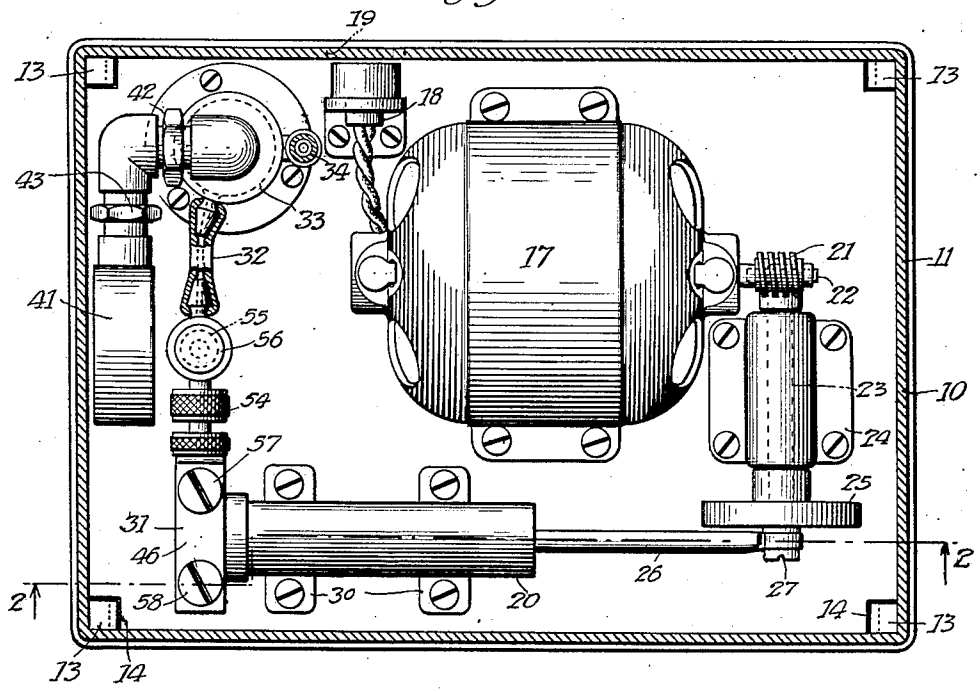
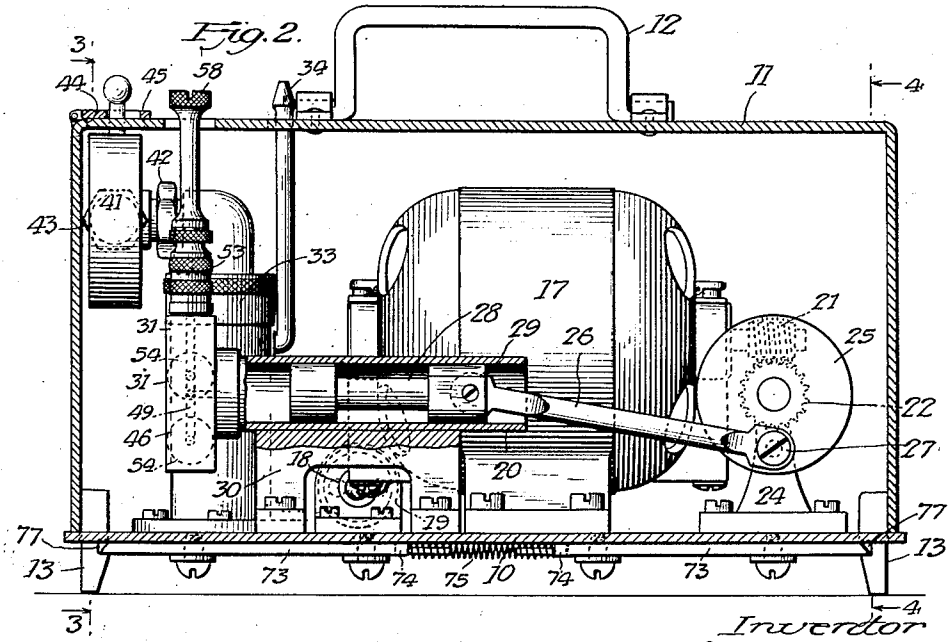


Fig. 2.



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Fig. 3.

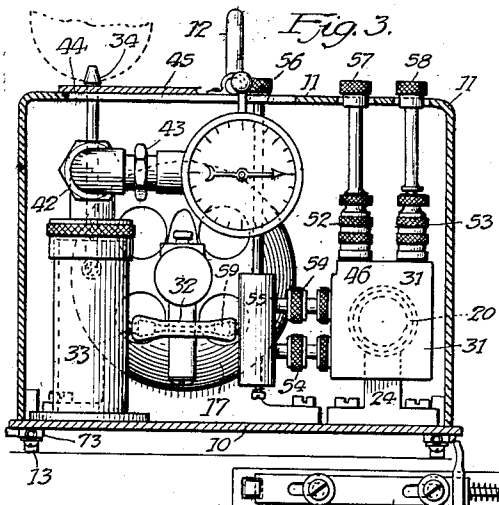


Fig. 4.

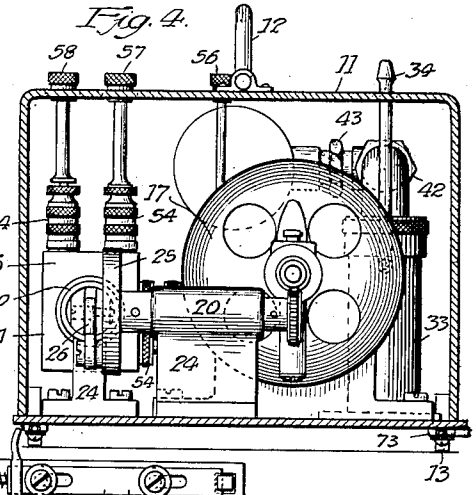


Fig. 5.

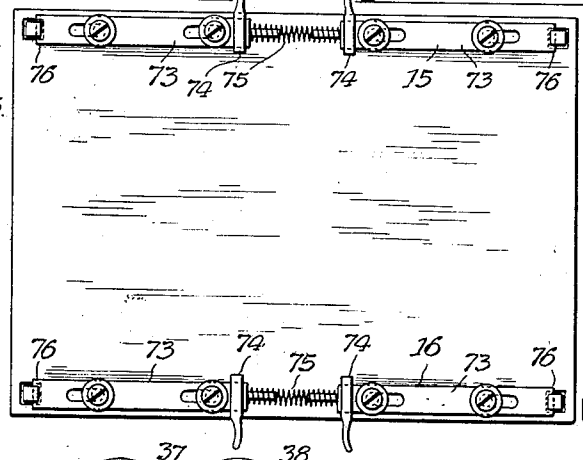


Fig. 6

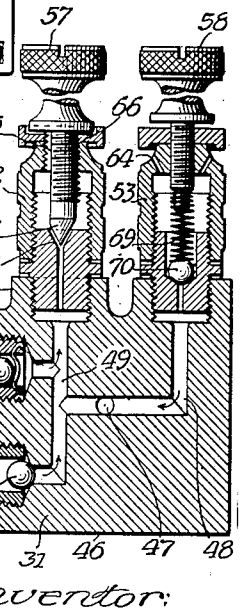
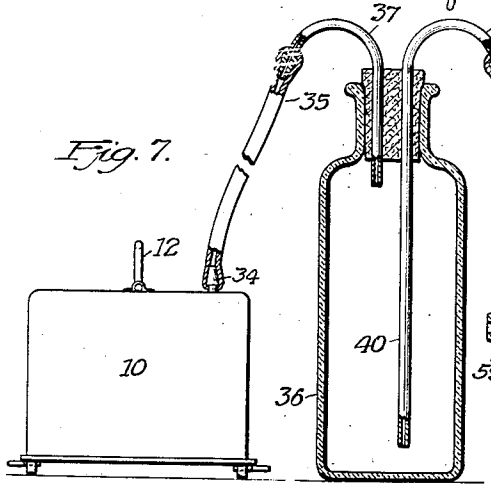


Fig. 7.



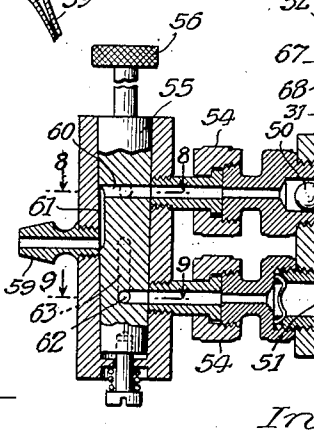


Fig. 8.

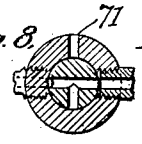
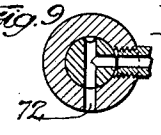


Fig. 9



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UNITED STATES PATENT OFFICE

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ASPIRATING AND EMBALMING DEVICE

Application filed January 18, 1930. Serial No. 421,788.

The invention relates to aspirating and embalming devices and has among its principal objects the provision of a construction which is relatively small, light in weight and compact so that it may be readily transported from one place to another and includes means whereby the device may be set to accomplish either the production of suction or pressure to withdraw and pump fluid from or to a body and includes means whereby the suction and pressure is regulated so that the device may be set to provide the required reduced or increased pressure to compensate for different sized bodies upon which work is being performed and to also provide means whereby the operator may ascertain the degree or amount of pressure applied during the performance of this work.

The invention has a further object the provision of a construction in which the several elements are encased and the provision of means whereby certain of the elements may be manipulated to control the actuation of the device from the outside of the casing, such as for instance, the means for changing over the device from suction to pressure and vice versa, the regulation of the degree of pressure and suction and also the determination of the pressure being produced.

The invention has these and other objects, all of which will be more readily understood when read in conjunction with the accompanying drawings which illustrate one embodiment of which the invention is susceptible, it being obvious that changes and modifications may be resorted to without departing from the spirit of the appended claims forming a part hereof.

In the drawings, Fig. 1 is a plan view of a device constructed according to one embodiment of the invention;

Fig. 2 is a section taken on line 2—2 of Fig. 1;

Fig. 3 is a section taken on line 3—3 of Fig. 2;

Fig. 4 is a section taken on line 4—4 of Fig. 2;

Fig. 5 is a bottom plan view of the base of the device showing a means for removably securing a cover or casing to the base plate;

Fig. 6 is a central section showing more in detail a means for controlling and regulating the increased and reduced air pressures;

Fig. 7 is an elevation showing the device applied to a receptacle from and to which fluid may be pumped; and

Figs. 8 and 9 are sections respectively taken on lines 8 and 9 of Fig. 6.

Whereas the device as herein shown is described as employed for use in the embalming art, it is manifest that the construction is not limited to this use and may be successfully employed by the medical profession to inject or extract various fluids to and from the body of a patient.

By referring to Figs. 1 and 2, it will be noted that the various elements employed in the structure are mounted upon a base generally designated 10 and are enclosed within a casing 11 having a handle 12, the casing having extensions or posts such as 13 which are adapted to be passed through apertures 14 in the base and held relatively to the base through the agency of a holding means such as that generally designated 15 and 16 most clearly shown in Fig. 5. The device contemplates the use of an electric motor 17 having a socket 18 preferably arranged in a manner so that a plug (not shown) may be associated with the socket through an opening such as 19 provided in the casing.

The motor 17 is provided to actuate a pump generally designated 20, the pump being provided to produce either an increased or decreased air pressure to thereby provide the necessary suction or pressure depending upon whether it is desired to supply or extract fluid to or from a body. The shaft of the motor 17 is provided with a worm 21 which cooperates with a worm wheel 22, the latter of which is secured to one end of a shaft 23 journalled in a bearing 24 secured to the base plate 10. The opposite end of the shaft 23 is provided with a disc 25, to which a crank arm 26 is connected at 27. The opposite end of the crank arm 26 is connected with a piston 28 located in a pump or piston cylinder 29, the cylinder being supported and secured to the base 10 through

the medium of a standard 30. It is manifest from the explanation of the structure thus far explained that when the motor is energized, the pump is actuated to create both a reduced and a compressed air condition, and therefore, when proper connections are made between the pump and the body of a person, fluid will either be ejected or withdrawn therefrom. A valve mechanism generally designated 31 is associated with the pump chamber and provides means for determining and controlling which of these pressures is to be applied and includes means for regulating these pressures, all of which will be explained in the following:

A tubular connection 32 is made with a pressure regulating chamber 33 and this pressure regulating chamber 33 has an extension 34 whereby a tubular connection such as 35 may be made therewith, it being understood that the tube 34 provides means of communication between the device illustrated in Figs. 1 and 2 and the receptacle designated 36 shown in Fig. 7. The receptacle 36 has a tubular extension 37 which is adapted for separable connection with the tube 35, and in addition, is provided with a goose neck or tubular element 38 to which a tube 39 is attached to form a connection between the various elements thus far explained and the body of the person being operated upon.

It is manifest that when the valve mechanism generally designated 31 is arranged to produce a reduced air condition, this reduced air condition will exist in the pressure regulating chamber 33, the extension 34, the tubular element 35 and the receptacle 36; this being accomplished through the goose neck 37 which will extract air from the receptacle 36 and cause a reduced air pressure to exist in the goose neck 38 and the tubular extension 39. This reduced air pressure will exhaust fluid from the body, it being understood that the extension 40 of the goose neck 38 extends to adjacent the bottom of the receptacle 36 while the goose neck 37 terminates near the top of the receptacle and therefore, prevents fluid supplied to the receptacle 36 from entering the mechanism carried by the plate 10 and encased within the casing 11.

The pressure regulating chamber 33 is provided with a compound pressure gauge 41 and this pressure gauge is connected with the pressure chamber through the agency of suitable pipe connections including the pipe unions respectively designated 42 and 43, which latter provide substantially a universal connection between the gauge and the pressure chamber which allows the gauge to be arranged in any one of several positions convenient for observation by the user of the device. To this end, the casing 11 may have an opening 44 through which the gauge 41 may be passed to respectively arrange the gauge within and without the casing. This opening may be closed when the gauge is in an inoperative position within the casing by means of a closure or trap 45.

It will be noted by referring particularly to Fig. 6 wherein the valve mechanism for controlling the provision of either a reduced or increased air pressure within a receptacle such as that generally designated 36 is illustrated, that the piston cylinder 29 is connected with a head 46 having a port 47 which completes a communication between the cylinder and the head. The head has a passage 48 and a branched passage 49 which respectively communicate with the check valves 50 and 51 and a regulating valve generally designated 52, the latter being employed to regulate the degree of reduced air pressure existing in the tubular passage 35 and other elements connected therewith. The passage 48 is provided with a pressure regulating valve 53 for regulating the degree of increased pressure supplied to the tubular element 36 and its connections. The check valves 50 and 51 are connected through the agency of couplings such as 54 with a cut-off valve generally designated 55 having a stem and a knurled head 56, the stem of which extends through an opening in the casing to thereby locate the knurled head thereof so that it is convenient and accessible for use by the operator.

It may be here stated that the regulating valves 52 and 53 are also each provided with a stem and knurled head respectively designated 57 and 58 and that these heads also extend through the casing 11 so that they are accessible for use by the operator. The body of the cut-off valve 55 is provided with an extension 59 which provides means for completing a connection between the pump and valve mechanism and the pressure regulating chamber 33 through the agency of the tube 32. The cut-off valve 55 is provided with a port 60 and a passage 61 and is also provided with the port 62 and passage 63. The respective ports and passages 60, 61, 62 and 63 are designed to complete a communication between the respective passages including the check valves 50 and 51, it being manifest that when the valve 55 is arranged in the manner shown in Fig. 6, that upon the suction stroke of the piston 28, a reduced air condition is created in the passages 47 and 49, 60 and 61, the check valve 50 allowing the reduced air pressure created, to exist in said passages while the check valve 51 at this time is seated to close the other branch of the passage 49. It is manifest that upon the compression stroke of the piston, the check valve 50 will be seated and the valve 51 unseated, however, since the position of the passages 62 and 63 of the valve 55 are at this time arranged in the manner most clearly shown in Fig. 6, the

air under compression is prevented from passing through the extension 58.

It will be noted that each of the regulating valves 52 and 53 are provided with ports or passages respectively designated 64 and 65 which will allow air under compression during the compression stroke of the piston to escape to atmosphere. The stem 66 of the valve 57 is provided with a valve portion 67 which is designed to cooperate with the valve seat 68 to thereby provide means for regulating the degree of reduced air pressure created upon the suction stroke of the piston, it being evident that the distance between the valve 67 and the seat 68 thereof provides for this regulation.

When the control valve 55 is rotated so as to provide a communication between the passage 63 and the port 62, the passage 61 and the port 60 are then arranged to prevent the existence of a reduced air pressure in the extension 58. When the passage 63 and port 62 are arranged in this last mentioned position, it is manifest that upon the compression stroke of the piston, the check valve 51 is unseated which allows the pressure created by the piston to pass said check valve, travel through the port 62 and the passage 63 and into the extension 58, the tubular member 32 and the pressure regulator chamber 33, it being understood that the valve 67 is at this time fully closed. It is evident that manipulation of the head 58 of the valve will apply a variable tension to the coil spring 69 and thus hold the valve 70 against the valve seat provided therefor which will vary the degree of tension applied to the valve 70 and thus determine the degree of pressure of the increased air pressure introduced to the pressure chamber 33 and the various elements connected therewith.

By referring to Figs. 8 and 9, it will be noted that the housing for the valve 55 is provided with ports 71 and 72 which will allow the escape of either increased or reduced air pressure therethrough depending upon the position of the valve 55.

By referring to Fig. 5, a means for releasably locking the cover 11 to the base plate 10 is shown in detail. This means, in the present instance, includes a plurality of reciprocably mounted elements 73 having the finger pieces 74. The reciprocable elements 73 are held in distended condition through the agency of a coil spring 75 which maintains the ends such as 76 of the reciprocable elements in engagement with a notch 77 provided adjacent the lower extremities of each of the posts or legs 13 (see Fig. 2).

It is evident that when the finger pieces 74 are manipulated to bring them towards each other, the spring 75 is compressed and the ends 76 of the reciprocable elements are released from the notches 77, allowing the cover or casing 11 to be disconnected from the base plate 10.

From the foregoing description of the construction, it is manifest that when a proper connection is formed with the motor 17, the latter will be actuated which causes the piston of the pump to reciprocate producing a reduced and increased air condition, either one of which is also caused to exist in the tubular element 32 and the various elements connected therewith, the reduced or increased air pressure existing therein being controlled through the agency of the control valve 55. It is further evident that the valves respectively designated 57 and 58 provide a means for varying and regulating the degree of pressure, either reduced or increased, existing in the tubular passage 32 and the elements connected with this passage. It is further manifest that the entire structure is of a relatively small, compact, and light weight character which facilitates its transportation and arrangement for use. It is also evident that since heads such as 56, 57 and 58 of the valves associated therewith are arranged with respect to the casing so that they may be manipulated from the outside of the casing, it is manifest that this adds to the convenience whereby the operator may manipulate these devices which facilitates the ease with which the pressures created by the device may be controlled.

It is further evident that by virtue of the provision of a pressure chamber such as 33 that the pressure existing in the tubular connection such as 35 and the elements connected therewith will be of a constant and regular character and by virtue of the fact that the compound gauge connected with the pressure chamber is capable of substantial universal movement, this element may be located within and arranged on the outside of the casing and may be adjusted for convenient observation by the user.

Having thus described the invention, what I claim and desire to cover by Letters Patent is:

1. In an aspirating and embalming device, the combination of a pump for creating air pressures above and below atmospheric pressure, a motor for driving the pump, a tubular element and valve means for connecting the pump with said tubular element to respectively provide air pressures above and below atmospheric pressure in said tubular element, and means for independently varying the respective pressures.

2. In an aspirating and emblaming device, the combination of a pump for creating air pressures above and below atmospheric pressure, a motor for driving the pump, a tubular element and valve means for connecting the pump with said tubular element to respectively provide said air pressures in said tubular element, means for controllably

varying said pressures, and a pressure gauge located between said valve means.

3. In an aspirating and embalming device, the combination of a pump for creating air pressures above and below atmospheric pressure, a motor for driving the pump, a tubular element connected with the pump, a pressure chamber having means for connecting said chamber with a receptacle, and valve means for connecting the pump and chamber to respectively provide said air pressures in said chamber.

4. In an aspirating and embalming device, the combination of a pump for creating air pressures above and below atmospheric pressure, a motor for driving the pump, a tubular element connected with the pump, a pressure chamber, valve means for connecting the pump and chamber having means for connecting said chamber with a receptacle to respectively provide said air pressures in said chamber, and means for controllably varying the pressure introduced to said chamber.

5. In an aspirating and embalming device, the combination of a pump for creating air pressures above and below atmospheric pressure, a motor for driving the pump, a pressure chamber, valve means for connecting the pump and chamber to respectively provide said air pressures in said chamber. a pressure gauge connected with said chamber and said chamber having means whereby a tubular member may be attached thereto for connection with a receptacle.

6. In an aspirating and embalming device, the combination of a pump for creating air pressures above and below atmospheric pressure, a motor for driving the pump, a pressure chamber, valve means for connecting the pump and chamber to provide air pressure above and below atmospheric pressure in said chamber, and a compound pressure gauge connected with said chamber said chamber having means whereby said chamber may be connected with a receptacle.

7. A portable aspirating and embalming device, the combination of a base, a motor. a pump, and a pressure chamber connected to said base, said chamber being adapted to be connected with a receptacle. valve means located between the pump and chamber, said valve means providing means for controlling the pump to respectively provide an air pressure in said chamber above and below atmospheric pressure, and means for independently varying the pressure in said chamber.

8. A portable aspirating and embalming device, the combination of a base, a motor, a pump, and a pressure chamber connected to said base, valve means located between the pump and chamber, said valve means providing means for controlling the pump to respectively provide air pressures above and below atmospheric pressure in said chamber, means for independently varying the pressure in said chamber, said chamber having a tubular extension for separably connecting a receptacle therewith, and a compound pressure gauge connected with said chamber.

9. In a device of the kind described, the combination of a motor, a pump operably connected with the motor for creating a reduced and increased air pressure, an element providing an air passage connected with the pump, valve means for connecting said passage and pump to respectively provide an increased and reduced air pressure in said passage, means for controllably varying the increased and reduced air pressure, a casing enclosing said pump, motor and element, said element having a portion which is accessible from the outside of the casing and said valve, and means having an element accessible from the outside of the casing to regulate said valve and means.

10. In a device of the kind described, the combination of a motor, a pump operably connected with the motor for providing an increased and reduced air pressure, an element providing a passage for said reduced and increased air pressure connected with the pump, valve means for connecting said passage and pump to respectively provide an increased and reduced air pressure in said passage, a pressure gauge connected with said passage, a casing enclosing said motor, pump and valve, said casing having means whereby said pressure gauge may be moved into and out of said casing and said valve may be manipulated from the outside of said casing.

11. In a device of the kind described, the combination of a motor, a pump operably connected with the motor for providing an increased and reduced air pressure, an element providing a passage for said reduced and increased air pressure connected with the pump, valve means for connecting said passage and pump to respectively provide an increased and reduced air pressure in said passage, a pressure gauge connected with said passage, a casing enclosing said motor, pump and valve, said casing having means whereby said pressure gauge may be moved into and out of said casing, and means providing for movement of said gauge upon a vertical axis when arranged exteriorly of the casing.

12. In a device of the kind described, the combination of a motor, a pump operably connected with the motor for providing an increased and reduced air pressure, an element providing a passage for said reduced and increased air pressure connected with the pump, valve means for connecting said passage and pump to respectively provide an increased and reduced air pressure in said passage, a pressure gauge connected with said passage, a casing enclosing said motor, pump

and valve, said casing having means whereby said pressure gauge may be moved into and out of said casing and means providing for universal movement of said gauge.

In witness whereof, I hereunto subscribe my name this 9th day of January A. D., 1930.

ERNEST KAISER.