No. 890,484. PATENTED JUNE 9, 1908.

G. VON ACH.

APPARATUS FOR ADMINISTERING OXYGEN OR THE LIKE.

APPLICATION FILED JAN. 6, 1908.

4 SHEETS—SHEET 1.

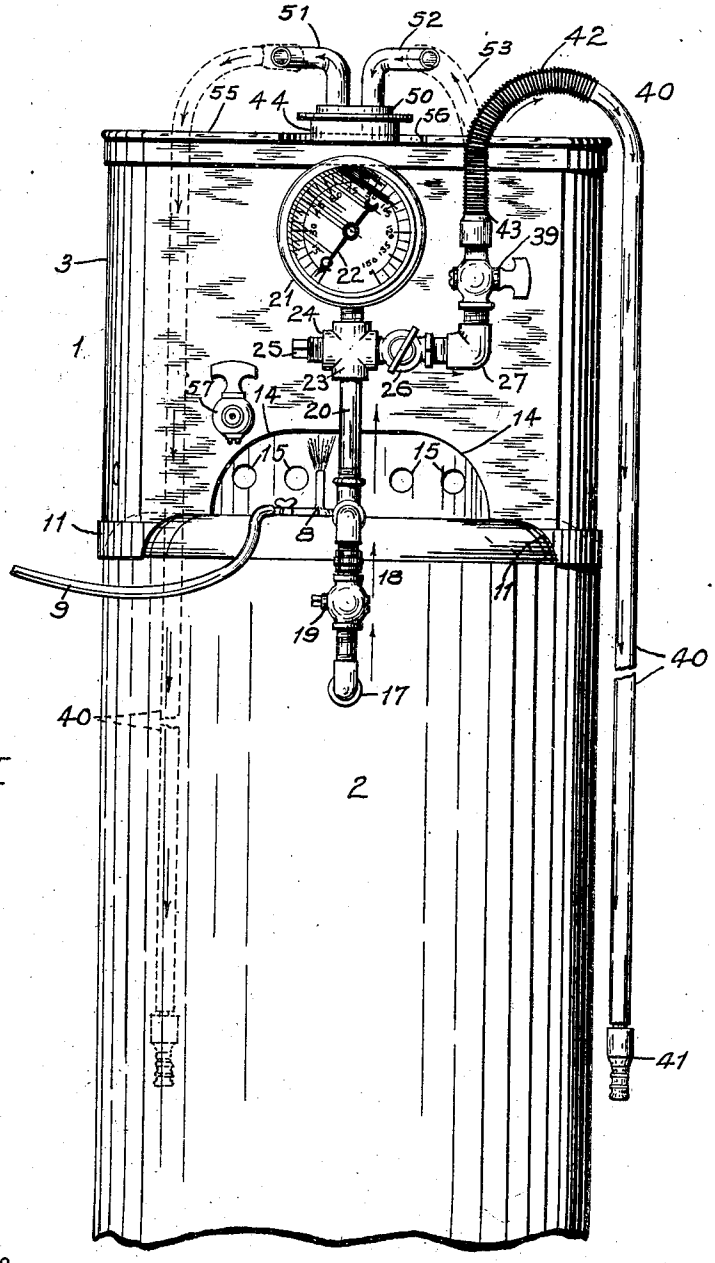

FIG. I.

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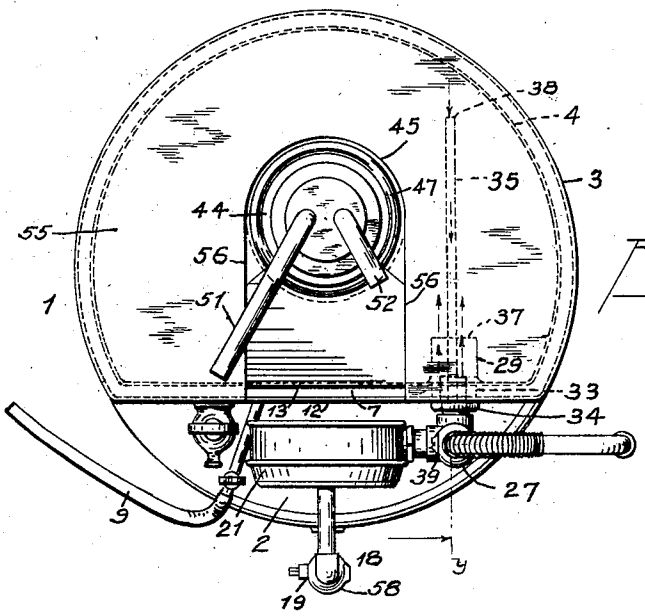

FIG 2

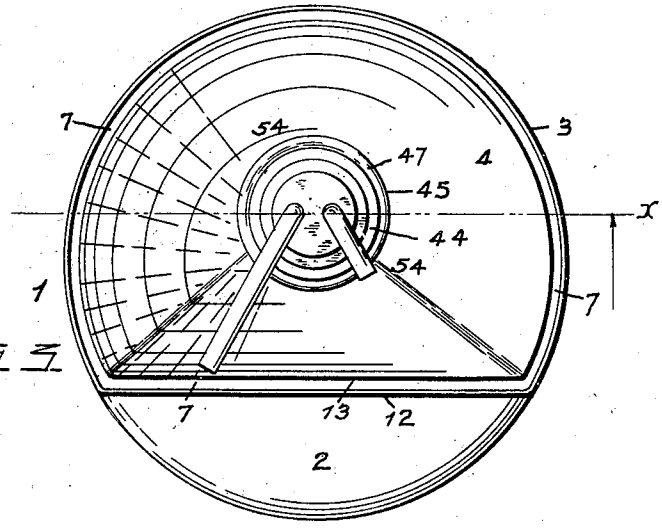

FIG 3

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4 SHEETS—SHEET 3.

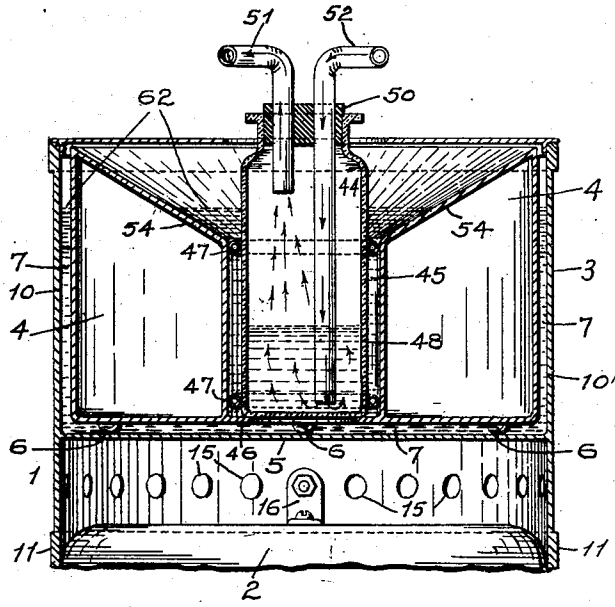

FIG. 4.

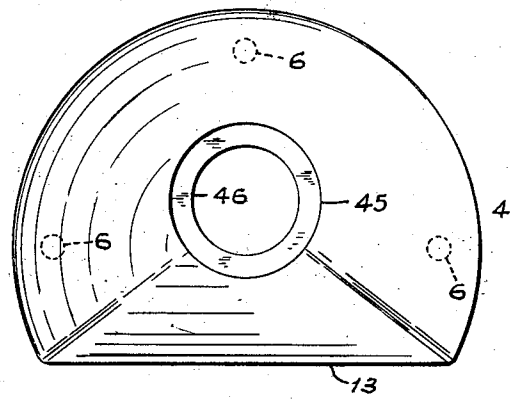

FIG. 5.

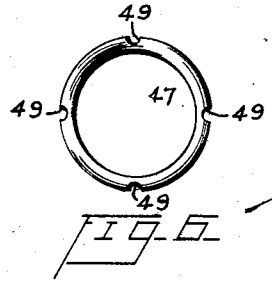

FIG. 6.

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4 SHEETS—SHEET 4.

FIG. 7.

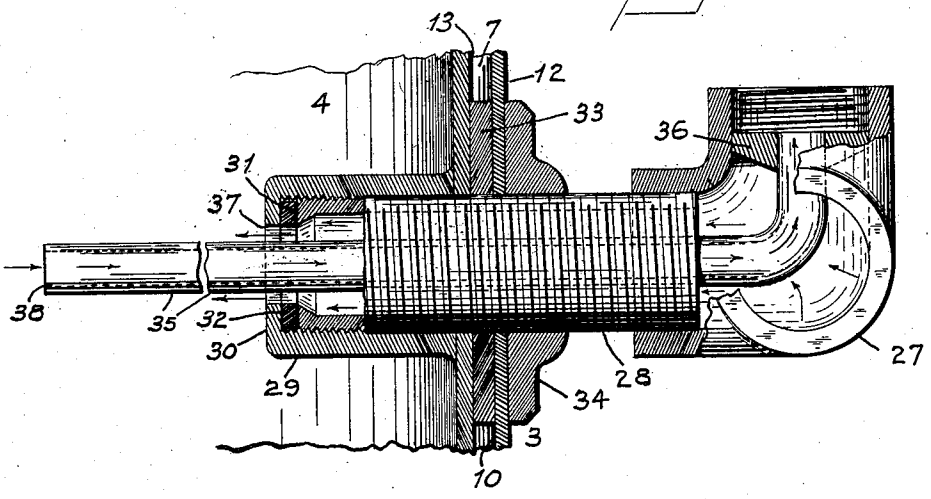
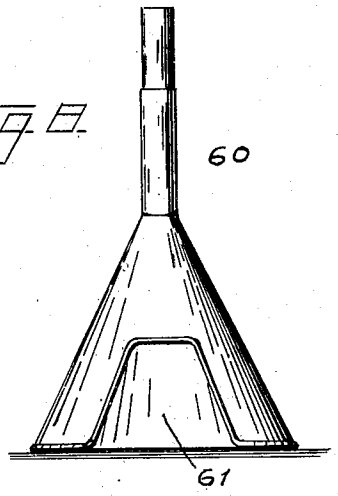


FIG. 8.



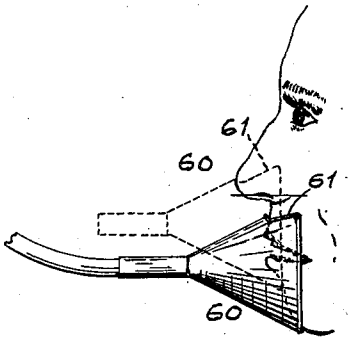


FIG. 9.

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR ADMINISTERING OXYGEN OR THE LIKE.

No. 890,484. Specification of Letters Patent. Patented June 9, 1908.

Application filed January 6, 1908. Serial No. 409,425.

To all whom it may concern:

Be it known that I, GEORGE VON ACH, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain Improvements in Apparatus for Administering Oxygen or the Like, of which the following is a specification.

This invention relates to certain improvements in apparatus for administering oxygen and other vapors by inhalation, and enabling the same to be taken in a cold moist, cold dry, hot moist or hot dry condition.

The objects of the invention are to provide an improved means for administering and heating oxygen; to provide improved storage means whereby prescribed quantities of oxygen may be stored and heated; to secure for these purposes means which can be readily combined with the usual containing cylinder, either permanently or temporarily; to provide a compact and efficient construction, which is strong, durable and inexpensive; to thus facilitate and simplify the administering of gases and vapors, and to obtain other advantages and results as may be brought out in the following description.

Referring to the accompanying drawings, in which like numerals of reference indicate the same parts in the several figures, Figure 1 is a front elevation of an apparatus of my improved construction for administering oxygen, a portion of the containing cylinder being broken away; Fig. 2 is a plan of the same; Fig. 3 is a similar plan with the cover and the outer attachments removed; Fig. 4 is central vertical section taken on line *x*, Fig. 3, looking in the direction indicated by the arrow; Fig. 5 is a plan illustrating a certain storage tank; Fig. 6 is a detail view of a certain washer; Fig. 7 is a side elevation of a three-way pipe connection and associated parts thereof, partly in section on line *y*, Fig. 2, looking in the direction indicated by the arrow; Fig. 8 illustrates an improved mouth piece, and Fig. 9 is a side view showing the use of said mouth piece.

In said drawings, 1 indicates the body portion of my improved device in its preferred form and adapted to be placed on the top of a gas cylinder 2 charged with oxygen or other vapor. The said device comprises an outer casing 3 and a storage tank 4, the said tank being of an air-tight construction and for the purpose of storing prescribed quantities of oxygen. The tank 4 is raised off the bottom 5 of the outer casing by means of feet 6, (see Fig. 4), and is constructed somewhat smaller than the outer casing 3, so as to provide ample space at its bottom and sides to form a water jacket 7, whereby the oxygen in the tank may be heated or warmed by pouring hot water therein. If hot water cannot be obtained, cold water may be used and heated by means of the gas burner 8 beneath the bottom 5 of the casing, set on the cylinder 2 and connected by a tube 9 to any suitable gas supply.

The outer casing 3, of my improved device comprises walls 10 of sheet metal, and the bottom 5 which is sufficiently above the lower edges of the said walls to provide a flange or skirt 11 adapted to fit onto the rounded upper end or top of the cylinder 2. At the front of my improved device, both the casing 3 and the inner storage tank 4 are flattened or cut away on a chordal plane, as shown in Figs. 2, 3 and 5, at 12, 13. For this portion of the casing 3, its flange or skirt is cut away as at 14, and the rest of the way around the casing said skirt or flange has apertures 15. Preferably, one of these apertures is used to pass a bolt through into a bracket 16 which has its other arm bolted or screwed to the top of the cylinder 2, and serves to connect the device 1 to the cylinder when made separate as shown. If preferred, the device 1 can be made integral with the cylinder.

The oxygen is taken from an outlet 17 of the cylinder 2 by means of a pipe 18 which extends upward and bends in over the top of the cylinder to lie in front of the flattened or recessed portion of the body 1, as shown. A valve 19 is in the lower part of this pipe, and when this valve is opened by means of a key upon the delivery of the apparatus, the oxygen will pass up through the pipe 20. To the top of a four-way coupling 23 at the top of said pipe 20, is connected a gage 21, and from which the pressure in pounds of the gas contained in the tank may be ascertained by referring to the indicator 22; the number of gallons of gas in the cylinder may also be recorded by constructing the cylinder of such size that a gallon will equal one pound pressure. For other sizes of cylinder, a separate scale of gallons could be marked on the same gage.

Of the other two arms of the four-way coupling 23, one as 24 is ordinarily closed by a screw plug 25 which however can be removed at the factory for filling the cylinder.

The opposite arm of the four-way coupling is connected to a stop cock or valve 26, and beyond said valve is a three-way coupling 27, one of whose arms is directed upward and the other toward the device 1. From this last-mentioned arm of the three-way coupling, an exteriorly threaded pipe 28 leads through the walls of the outer casing 3 and of the storage tank 4, screwing into an inwardly projecting socket 29 on the wall of the tank. The end of this socket has a stop or flange 30 bent radially inward, and between said flange and the end of the pipe 31 is compressed a gasket 32 to secure greater imperviousness.

Since the pipe 28 passes through the water jacket 7, a resilient washer 33 also surrounds the pipe at this point, and is adapted to be pinched tight between the storage tank and outer casing by a nut 34 screwed on the pipe 28 against the outside of said outer casing. Thus to fill the storage tank 4, the valve 26 is opened and the oxygen passes into the tank through said valve, the three-way coupling 27 and the pipe 28, as indicated by the arrow.

When the desired amount, as indicated by the gage 21, usually five gallons, has passed into the storage tank, the valve 26 is closed, and the oxygen may then be heated as hereinbefore described. After heating to the desired temperature, the oxygen may be administered to the patient, and the means by which the gas leaves the storage tank will next be described. An outlet tube 35 of considerably smaller diameter than the inlet pipe 28 and its opening into the storage tank, leads outward centrally through the same, and in the three-way coupling 27 is bent upward and has its end held in a plug 36 which otherwise closes the upwardly leading arm of the three-way coupling. This outlet tube 35 preferably extends into the tank for a considerable distance beyond the inlet 37, as at 38, so as to take the oxygen from the storage tank at a distance from the inlet. This construction is particularly desired when both valves 26 and 39 are opened and a continued supply of oxygen is administered to a patient, as the cold oxygen will become heated in its travel through the storage tank to the outlet 38 of the tube 35.

From the upper arm of the three-way coupling 27, a flexible tube 40 leads to a mouth-piece 41 which may be of any suitable and well-known form. A coiled spring 42 is mounted on the secured end of the tube as shown at 43, Fig. 1, to prevent the tube from bending flatwise and to provide an unobstructed annular interior channel in the tube at this point.

A valve or stop-cock 39 is provided just above the upright arm of the three-way coupling 27, so as to control the supply of gas through the discharge tube 40 to the patient, if desired. I prefer, however, to always make the outlet tube 35 from the storage tank of such size that no more can escape through it than a patient can safely take.

When moist oxygen has been prescribed and is desired to be administered, a wash bottle 44 is employed, (see Figs. 1, 2, 3 and 4). Said bottle is placed in a central space or chamber 45 of the storage tank said chamber extending through from top to bottom of the said tank, and the bottle standing upon an annular inwardly projecting flange 46 at the bottom of the tank. The bottom of the bottle is thus exposed, and said bottle is furthermore smaller in diameter than its chamber 45, so that water can flow around it from the water-jacket; resilient washers 47 on the outside of the body portion 48 of the said bottle hold it central in the chamber, said washers being provided with notches 49, 49 to permit the passage of water so as to heat the contents of the bottle and also assist in heating the storage tank. The mouth of the bottle 44 is tightly closed by a stopper 50 through which two tubes 51 and 52 extend, one as 52, nearly to the bottom of the bottle and the other 51 only just through the stopper 50. The outer ends of both tubes 51 and 52 are bent laterally, and in use the supply hose 40 is removed from its position first above described and slipped onto the short tube 51 of the bottle, while another short piece of hose 53 is used to connect the discharge pipe of the supply tank 4 to the long tube of the bottle, all as shown in dotted lines in Fig. 1.

By the above arrangement, the bottle 44 being partly filled with water, the gas before going to the patient will bubble through said water and be rendered moist, and this whether it is hot or cold. Furthermore, drugs or medicines can be put in the said bottle and also administered to the patient with the gas.

Preferably, the top of the storage tank 4 is dished or centrally depressed, as shown at 54 in Figs. 3, 4 and 5, whereby the operation of the bottle 44 may be more clearly observed when in use, and also a greater heating area of both oxygen tank and water jacket secured. To further facilitate observing the action of the gas in the bottle, the cover 55 for the casing 3, as shown in Fig. 2, is open from its front edge to its center, or slotted, as at 56.

A valve or pet cock 57 in the wall 12 of the outer casing 3 and at the bottom of the water jacket, is for the purpose of drawing the water from the same. It will also be noted that the piping projecting from the cylinder 2 at the valve 18, affords a handle 58 by which the device and cylinder may be grasped.

For administering oxygen to a patient in an unconscious condition or unable to hold

the mouth piece 41 I have provided a funnel 60 which may be screwed into the end of the tube 40 in place of the mouth piece 41, said cap having at one side a recess 61 in its edge to permit its being held over the mouth as shown in full lines in Fig. 9 or over the mouth and nose as shown in dotted lines in the same figure.

It will be understood that in filling the water jacket between the storage tank 4 and outer casing 3, enough is poured in so that its level stands a considerable distance up the top sloping annular surface of the storage tank, as shown at 62 in Fig. 4. This affords a considerable body of water, and at the same time gives large area of surface contact with the tank.

The storage tank 4, it will be understood, may be made of sheet steel, and after the manner of the cylinder 2, so as to withstand the same pressure as said cylinder, or it may be constructed in any other suitable manner.

Having thus described the invention, what I claim as new is:

1. The combination with a gas cylinder, of a device comprising an inner storage tank and an outer casing with a water space between, means at the bottom of said device for mounting it upon the top of the cylinder, means for conducting gas from said cylinder to said storage tank, and means for leading it from said tank for use.

2. The combination with a gas cylinder, of an outer casing having a bottom flange adapted to be seated on the top of said cylinder, a gas storage tank in the upper part of said casing forming therewith an annular water jacket, means for conducting gas from said cylinder to said storage tank, and means for leading it from said tank for use.

3. In an apparatus for administering oxygen, the combination with a storage tank, of a three-way coupling, concentric inlet and discharge ducts extending from said tank through one arm of said coupling and connecting one with each of the other arms, and means for supplying gas to and receiving gas from said other arms of the coupling, respectively.

4. In an apparatus for administering oxygen, the combination of an inner gas storage tank, an outer casing forming with said tank a water jacket, concentric inlet and discharge ducts extending through the walls of both said tank and outer casing and forming a tight joint with both, and means for supplying gas to and receiving gas from said inlet and discharge ducts, respectively.

5. In an apparatus for administering oxygen, the combination of an inner gas storage tank, an outer casing forming with said tank a water jacket, a pipe screwed into the wall of said tank and forming an impervious joint therewith, a gasket upon said pipe between the tank and outer casing, a nut screwed upon said pipe against the outer casing, an inner pipe leading through said first-mentioned pipe, and means for supplying gas to and receiving gas from said pipes, respectively.

6. In an apparatus for administering oxygen, the combination of an inner gas storage tank, an outer casing forming with said tank a water jacket, a pipe screwed into the wall of said tank and forming an impervious joint therewith, a gasket upon said pipe between the tank and outer casing, a nut screwed upon said pipe against the outer casing, an inner pipe leading through said first-mentioned pipe, a three-way coupling connected at one arm to said outer pipe, the inner pipe leading to one of the other arms, and means for supplying gas to and receiving gas from the arms of said coupling other than the said one connected to the outer pipe, respectively.

7. The combination with a gas cylinder, of a device fitting at its bottom upon the top of said cylinder and having an inner storage tank and an outer casing with a water space between, pipe connections uniting the said device and cylinder and placing the interiors of the storage tank and cylinder in communication, and means for leading gas from said storage tank for use.

8. The combination with a gas cylinder, of a casing adapted to sit upon the top of said cylinder and being flattened at one side on a chordal plane in plan view, a storage tank in said casing, valved pipe connections leading from said cylinder through said flattened side of the casing into the tank and out again, and a flexible discharge tube connected to said pipe connections.

9. The combination with a gas cylinder, of a casing adapted to sit upon the top of said cylinder and being flattened at one side on a chordal plane in plan view, a storage tank in said casing, valved pipe connections leading from the side of said cylinder upward in front of said flattened side of the casing, a gage on said pipe connections, a valved branch pipe leading to the said gas storage tank, a valved outlet pipe leading from said tank, and a flexible supply tube connected to said outlet pipe.

10. In a device for administering oxygen and the like, an outer casing adapted to be heated from beneath, an inner storage tank separated from said casing by a water jacket, said tank being annular and providing a central vertical chamber or space open at its top and bottom, a wash bottle in said chamber or space, means for supplying gas to said tank, and means for leading gas from said tank through said wash bottle.

11. In a device for administering oxygen and the like, an outer casing adapted to be heated from beneath, an inner, annular stor-

age tank separated from said casing by a water jacket, said tank thus providing a central chamber open at the top and bottom and having its top sloping inwardly toward said chamber, a wash bottle in said chamber, a cover for the said casing apertured out from said bottle on one side thereof, means for supplying gas to said tank, and means for leading gas from said tank through said wash bottle.

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In presence of—
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BERTHA S. FULTON.