

June 6, 1933.

T. A. TAYLOR

1,913,347

APPARATUS FOR REGULATING THE TEMPERATURE AND OXYGEN CONTENTS OF AIR

Filed Dec. 19, 1930

2 Sheets-Sheet 1

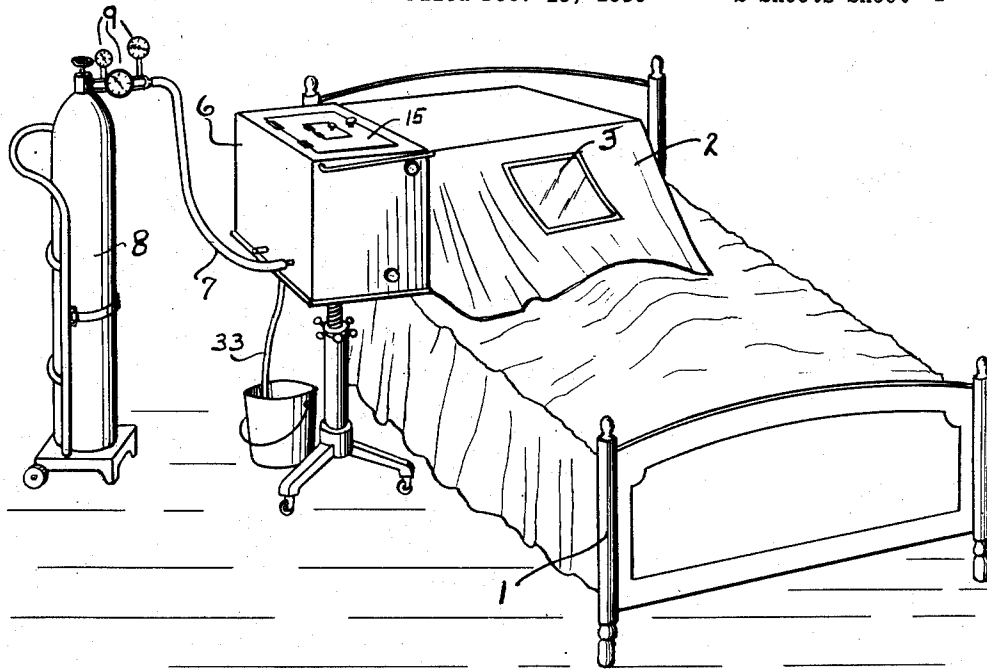


Fig. 1.

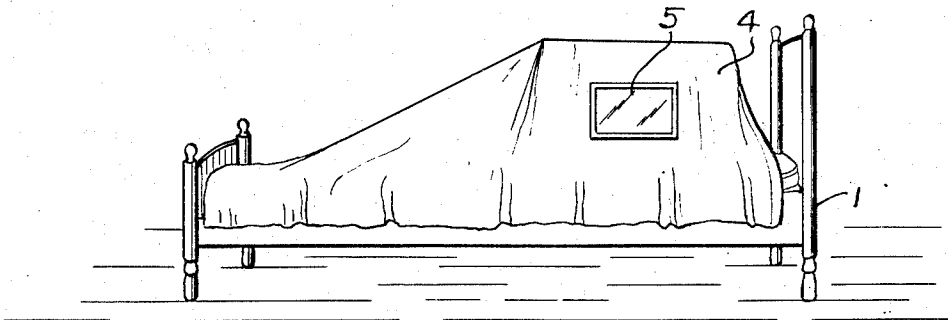


Fig. 2.

T.A. Taylor Inventor

Jesse R. Stone
By &
R. B. Clark

Attorneys

June 6, 1933.

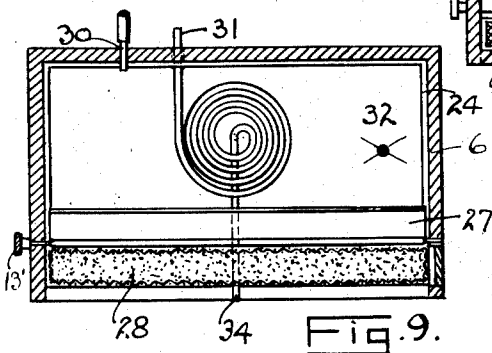
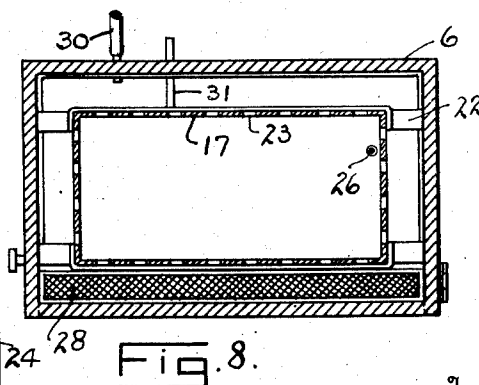
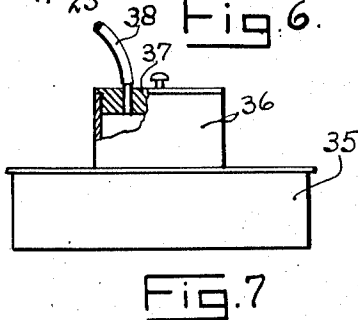
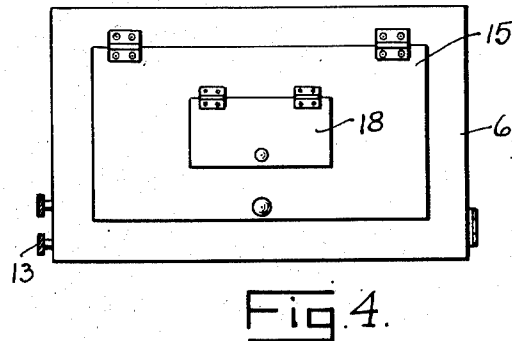
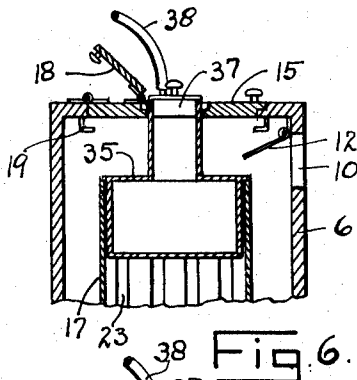
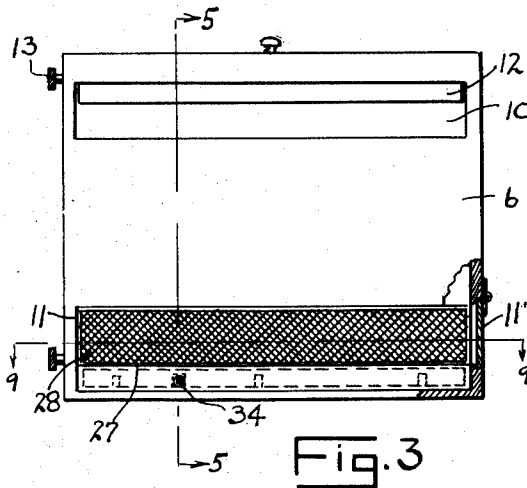
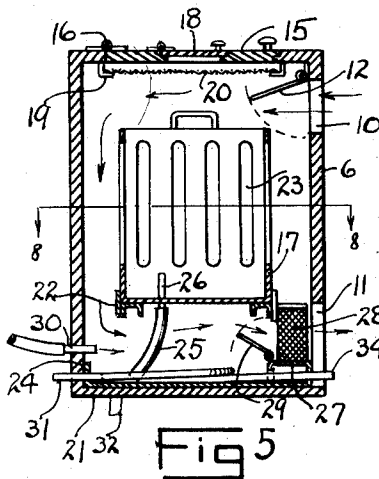
T. A. TAYLOR

1,913,347

APPARATUS FOR REGULATING THE TEMPERATURE AND OXYGEN CONTENTS OF AIR

Filed Dec. 19, 1930

2 Sheets-Sheet 2



Inventor

T. A. Taylor

Jesse P. Stone

Leslie B. Clark

Attorneys

UNITED STATES PATENT OFFICE

THADDEUS A. TAYLOR, OF LUFKIN, TEXAS

APPARATUS FOR REGULATING THE TEMPERATURE AND OXYGEN CONTENTS OF AIR

Application filed December 19, 1930. Serial No. 503,360.

My invention relates to an improved apparatus for administering oxygen to patients and for regulating the temperature of the air.

The invention is an improvement upon that shown in my prior application for patent, Serial No. 479,150 filed Sept. 2, 1930.

It is an object of the present invention to provide a device for administering oxygen to a patient in which device the air may be mixed with oxygen in the desired proportions without difficulty.

I also desire to be able to eliminate carbon dioxide from the air passing to the patient.

I aim also to provide for the cooling of the air passing to the patient so that the device may be used in treating fever or to render the air of the desired temperature.

It is an object to provide a device which may be used to automatically control the air delivered to a patient and to feed into the air stream medicated ingredients desired in the treatment of the patient.

I also desire to improve the means for controlling the temperature of the air so that it will operate most effectively.

In the drawings herewith, Fig. 1 is a perspective view showing the apparatus assembled for use.

Fig. 2 is a side elevation of a slightly modified form of tent employed with the device.

Fig. 3 is a front elevation of the cooling box.

Fig. 4 is a top plan view of the same.

Fig. 5 is a transverse section on the plane 5-5 of Fig. 3.

Fig. 6 is a vertical section through the box with a modified container for the cooling agent.

Fig. 7 is a broken side view of the modified container removed.

Fig. 8 is a transverse section on the plane 8-8 of Fig. 5.

Fig. 9 is a similar transverse section on the plane 9-9 of Fig. 3.

In carrying out my invention, and with reference particularly to Figs. 1 and 2, I show a bed 1 upon which the patient may lie. There may be a small tent or enclosure 2 placed adjacent the head of the bed to form a compartment about the patient's head and

into which the oxygenated and cooled air may be delivered. This tent may have a window 3 so that the patient may be observed. If desired a larger tent, shown at 4 in Fig. 2, may be used to enclose the greater portion of the bed so that the temperature of the patient's body may also be regulated. Any number of windows 5 may be employed, as desired. The tents may be of canvas or rubberized fabric or other similar material.

To deliver treated air to the patient, a treating box 6 is arranged at one side of the tent and forming a closure for an opening in said tent. Said box may receive oxygen delivered thereto by way of a flexible pipe 7 connected with an oxygen tank 8. Said pipe may have indicators 9 thereon to show amount and pressure of the oxygen.

The treating box 6 is shown as of rectangular shape with a longitudinal slot or opening 10 at the upper end and a similar opening 11 at the lower end, said openings being presented through the side of the tent. The upper opening has a door or valve 12 hinged inside the opening and adapted to close the opening or, by adjustment, through a knob 13, to control the amount of air passing from the tent to the box.

The upper end of the box has a door, 15 hinged at 16, which may be opened to insert into the box the ice container 17. Said door has a smaller auxiliary door 18 which may be opened to allow a limited amount of air to enter the box or to accommodate the container shown in Fig. 7. Around the edge of the opening closed by the door 15, and on the inner side of the box, are inwardly turned flanges 19, to support a perforated plate, or screen 20 upon which medicated cotton or similar material may be placed, to deliver any desired vapor or fumes of medicine to the air stream.

The ice container 17 is supported off the bottom 21 of the box upon brackets 22 on the ends of the box. Said container is closed at the bottom but lateral openings 23 are formed in the sides and extending downwardly to a level spaced a desired distance from the bottom, thus leaving an imperforate portion at the lower end to contain water melting

from the ice. A flexible tube 25 is connected with a tube 26 in the bottom of the container to drain off the surplus of water in the bottom and deliver it without noise to the bottom of the box where it is received into a drip pan 24.

The drip pan is shallow and its upper margin adjacent the opening 11 is recurved to form a support at 27 for a foraminated container 28, for soda lime or similar compound. Said container 28 is placed immediately in front of the opening 11, so that the air passing to said opening will pass through the container and into contact with the soda lime, and thus the carbon dioxide in the air may be absorbed in the container. A valve or door 29 is placed in position to regulate the amount of air, or other gaseous fluid passing into the tent.

The oxygen enters the box by way of inlet pipes 30 or 31 in the side of the box near the bottom. If it is desired to cool the oxygen, it may enter pipe 31 which may be coiled or bent into folds in the bottom of the drip pan and be thus cooled by the drippings from the ice. These drippings may drain from the box through the openings 32 and pipe 33. Where the oxygen passes through the pipe 31 it is delivered directly into the tent through the outlet end 34 projecting from the opening 11.

Where solid carbon dioxide is to be used as a cooling agent, a separate container 35 may be used, said container being formed to seat in the upper end of the ice container 17. An upward extension 36 on the container 35 may extend through the opening or door 18 and be closed by a cover plug 37 having a vent tube 38 thereon which may convey the carbon dioxide gas to some desired point where it will not contaminate the air delivered to the patient. This container 35 may be inserted into position through a door 11' in the end of the box so that the same may be renewed or removed without disturbing the patient.

Any preferred form of refrigerating device may be employed including ice, solid CO₂, electrical refrigerator or the like.

The installation thus assembled enables me to easily control both the temperature of the air delivered to the patient as well as the oxygen content thereof and this is done without the necessity of pumps, fans or compressors. The relatively warm air from the tent will circulate into the box through the opening 10 and, in passing over the ice or the cooled sides of the container by convection the moisture in the air may be condensed and eliminated. Any carbon dioxide contained with the air will be absorbed in the soda lime container and the patient will thus be assured of a supply of fresh air at all times.

Where an additional supply of fresh air is desired, I may open either the door 18 or the

door 15 and a draft of air will be drawn in over the ice and delivered through the box as the colder air will then circulate downwardly due to its greater weight. Oxygen in the desired amount may be mixed with the air, thus passing to the tent, it being possible, however, to cut off the oxygen supply where it is not needed. Where the larger tent is used the larger door 15 may be opened and sufficient fresh air may enter to entirely replace the supply in the tent in a short time. Oxygen may simultaneously be supplied and the necessity for the use of the soda lime to eliminate the CO₂ may be avoided except in extreme cases where an excessive amount of CO₂ is thrown off by the patient. A simple and convenient structure is thus obtained which can be operated at low cost. I am enabled to use my invention to regulate the temperature alone in cases of fever, or in hot weather where it is desirable to maintain an agreeable temperature for sleeping. I am also able to keep the air pure and to supply such oxygen or other ingredient in the air as may be desired in the treatment of the particular patient being considered. The device may be used to maintain comfortable sleeping conditions where sickness is not present, and it is adapted for use generally where the air is to be refrigerated for any purpose.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A device of the character described including an enclosure having an upper opening at one side thereof, a portable treating box adapted to be connected in said opening to close the same, an upper inlet and a lower outlet from said box connecting with said enclosure, a container in said box having foraminated walls spaced from the walls of said box to contain ice, means to deliver oxygen to said device and dampers in said inlet and said outlet openings to regulate the convectional circulation of air to and from said box and said enclosure.

2. A device of the character described including an enclosure having an upper opening at one side thereof, a portable treating box adapted to be connected in said opening to close the same, an upper inlet and a lower outlet from said box connecting with said enclosure, a container in said box having foraminated walls spaced from the walls of said box to contain ice, an upper air inlet to said box outside said enclosure, means to control said air inlet, means to deliver oxygen to said device and dampers in said inlet and said outlet openings from said enclosure to regulate the convectional circulation of air to and from said box and said enclosure.

3. A portable air treating box adapted to be connected within an opening in a tent, said box being constructed to circulate air

to and from said tent, inlet and outlet openings therein to said tent, an inwardly opening damper in said inlet, an ice container in said box, a pan in said box, means to conduct liquid from said container to said pan, means to deliver oxygen through said box to said tent, means to cool said oxygen, and a damper in said outlet, in the manner described.

4. A portable air treating box adapted to be connected within an opening in a tent, said box being constructed to circulate air to and from said tent, inlet and outlet openings therein to said tent, an inwardly opening damper in said box, an ice container in said box, a cover for said box, an opening therein for the inlet of outside air to said box, means to control said last named opening, means to deliver oxygen to said tent through said box, means to cool said oxygen, and means to regulate the passage of air and oxygen from said box to said tent.

In testimony whereof I hereunto affix my signature this 16th day of December, A. D. 1930.

THADDEUS A. TAYLOR.