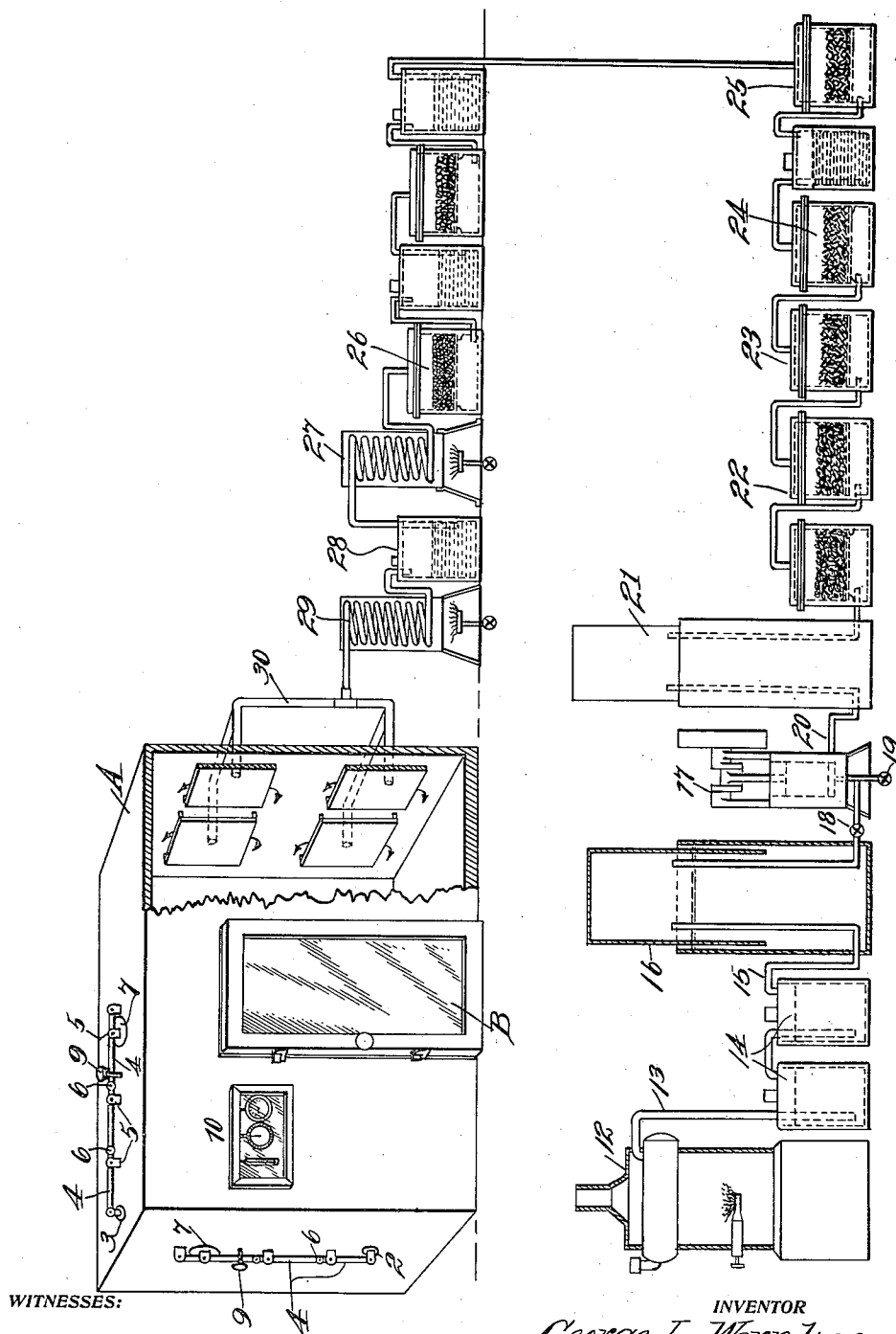


No. 859,156.

PATENTED JULY 2, 1907.

G. L. WARNKEN.  
PNEUMOMEDICAL APPARATUS.  
APPLICATION FILED SEPT. 4, 1906.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## PNEUMOMEDICAL APPARATUS.

No. 859,156.

Specification of Letters Patent.

Patented July 2, 1907.

Application filed September 4, 1906. Serial No. 333,113.

To all whom it may concern:

Be it known that I, GEORGE L. WARNKEN, a citizen of the United States, residing at Tuttletown, in the county of Tuolumne and State of California, have invented new and useful Improvements in Pneumomedical Apparatus, of which the following is a specification. —My invention relates to an apparatus which is designed to purify and prepare air to be used in the treatment of lung and other diseases.

10 It consists in the combination of parts and in details of construction which will be more fully explained by reference to the accompanying drawings, in which the figure shows diagrammatically the apparatus.

15 It is the object of my invention to provide an apparatus by which sterilized air, super-saturated with oxygen and with a weight, humidity, and temperature, properly regulated, may be supplied under suitable control for the treatment of patients afflicted with pneumonia and other diseases for which air thus prepared will be beneficial.

20 My apparatus consists of a room or inclosure A having a door B through which a patient may enter, said door being provided with gaskets and hermetically closable. Connected with this room are suitable outlets 2 and 3, 25 one located near the bottom of the room, and the other near the upper part, said outlets being susceptible of being opened by a certain interior pressure which may be regulated, and the opening of the lower one allows the discharge of heavier air from the lower part of the chamber, while lighter air may be discharged from the 30 upper part. These valves or gates may be variously constructed. A convenient means for operating such valves is by the use of a series of compound levers 4 fulcrumed upon suitable supports 5 and having the contiguous ends flexibly coupled together as at 6.

35 7 represents an adjustable connection with a thin diaphragm fixed in the wall or top of the room A so that an increase of pressure will act upon this diaphragm and through the connection 7 upon the first of the levers 4, 40 and the movement will be transmitted through the other levers to the valve 2 or 3 with which the device is connected; the object of the compound arrangement of the levers being to increase the movement transmitted from the diaphragm so as to provide for a sufficient opening of the escape valve. The amount of movement 45 may be regulated by means of adjusting screws as at 9. Within the chamber are located the thermometer, barometer and hygrometer gage as at 10, and a device for indicating the humidity, and such other well known 50 devices as may be found desirable.

The patient being located in the room, air is supplied thereto under suitable conditions as follows: Oxygen may be manufactured by any suitable well known process within a receptacle as at 12, and from this it is conveyed by a pipe 13 and delivered into a series of washing and cleansing chambers as at 14 whereby the oxygen is sufficiently purified. Such chambers are well known in the art and are not further described at this place. From these chambers the gas is conveyed by a pipe as at 15 and delivered into a gasometer 16 where 60 any desired quantity may be stored.

17 is a pumping apparatus connected with the gasometer by a pipe with suitable controlling cock as at 18, and 19 is an air pipe connecting with this pipe and with the pumping device; by means of regulating 65 cocks the proportion of air and oxygen may be regulated to suit requirements, and being drawn from these pipes by the pump, it is forced through a pipe 20 into a receiver 21 which may be of any suitable form and arrangement to prevent undue pulsation by reason of 70 the action of the pump. A small gasometer would produce this effect. The air and gas being thus mixed in suitable proportions are next passed through a cleansing apparatus 22 which may consist of a plurality of chambers containing cotton waste, or equivalent porous or fibrous material within which any oily 75 vapor derived from the pump may be arrested. In order to arrest and clear the passing fluid from any germs, it is next passed through a series of receptacles 23 which may contain nutrient gelatin or similar 80 material within which such germs may be arrested. From these chambers the air is next passed through a series of chambers 24 which may alternately contain a solution and solid matter which will free the passing air from carbonic acid gas. The air is then passed through 85 a drying solution contained in vessels as at 25, and is thus freed of any moisture which may be brought over to this point, and also any traces of ammonia which may be contained in it. Sulfuric acid will be very suitable for this purpose on account of its hygroscopic 90 properties. From the chambers 25 the air may then be passed through chambers as at 26 containing pumice stone or other material by which any traces of the acid will be taken up.

The chambers are preferably all arranged with perforated screens arranged near the bottom, beneath 95 which screens inlet pipes from the previous chambers are caused to discharge, and the air rising through the perforated screens will be properly distributed through the contents of each chamber. From the chambers 26 100

the air is then passed into chamber 27 through which the coiled pipe passes, and a heater is disposed below the chamber to raise the temperature. From this chamber the heated air passes through chambers 28  
5 containing pure water so that a certain amount of moisture will be taken up by the air as it passes through these chambers. It finally passes through another heating chamber 29 from which the air is delivered by pipe as at 30 into the chamber A.

10 The pipes passing through the chamber 29 are in the form of a coil and the temperature may be finally regulated either by a heating device below the chamber, or a refrigerant may be introduced so that as conditions demand, the air will finally be delivered into  
15 the chamber A at any desired temperature, and condition of moisture and the proportion of oxygen may be regulated to any desired degree; the pressure within the chamber may also be varied to suit requirements of all these conditions, being regulated and indicated  
20 by the apparatus contained within the chamber as previously described.

It will be understood that the various chambers or containers through which the air is passed before reaching the final chamber are made of glass or suitable  
25 material, and the substances contained within the chambers will be of such a character as to chemically deprive the passing air of any deleterious gas or vapor associated therewith, such as chlorin, ammonia, acid and alkaline vapors or the like; the object being in any  
30 case to supply the room in which the patient is located

with an absolutely pure air, with such increase of oxygen or other gas or vapor as may be required.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. In an apparatus for the treatment of diseases, the 35 combination of an inclosure within which the patient is placed, said chamber having an outlet, connections whereby air and oxygen or other gases are supplied to the inclosure, means for controlling the temperature, pressure and humidity of the gas within the inclosure, said means 40 including a series of levers fulcrumed on the inclosure, a flexible diaphragm fixed to the inclosure and subjected to the variations of pressure therein, and a valve controlling said outlet, said diaphragm acting through the levers to automatically open and close the valve in response to 45 the pressure variations, whereby the pressure within the inclosure is regulated.

2. In an apparatus for the treatment of disease, the combination of an inclosure having outlets in its upper and lower portions, means for supplying air and oxygen 50 to the inclosure, means for controlling the temperature, pressure and humidity of the gas within the inclosure, said means including a series of compound levers fulcrumed on the inclosure, a flexible diaphragm fixed to the inclosure and exposed to the internal pressure thereof, valves 55 controlling said outlets, said valves being connected with the series of levers, and said diaphragms acting through the series of levers to open and close the valves, and instruments whereby the temperature and pressure humidity are indicated. 60

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

GEORGE L. WARNKEN.

Witnesses:

S. H. NOURSE,  
GEO. H. STRONG.