

Dec. 4, 1923.

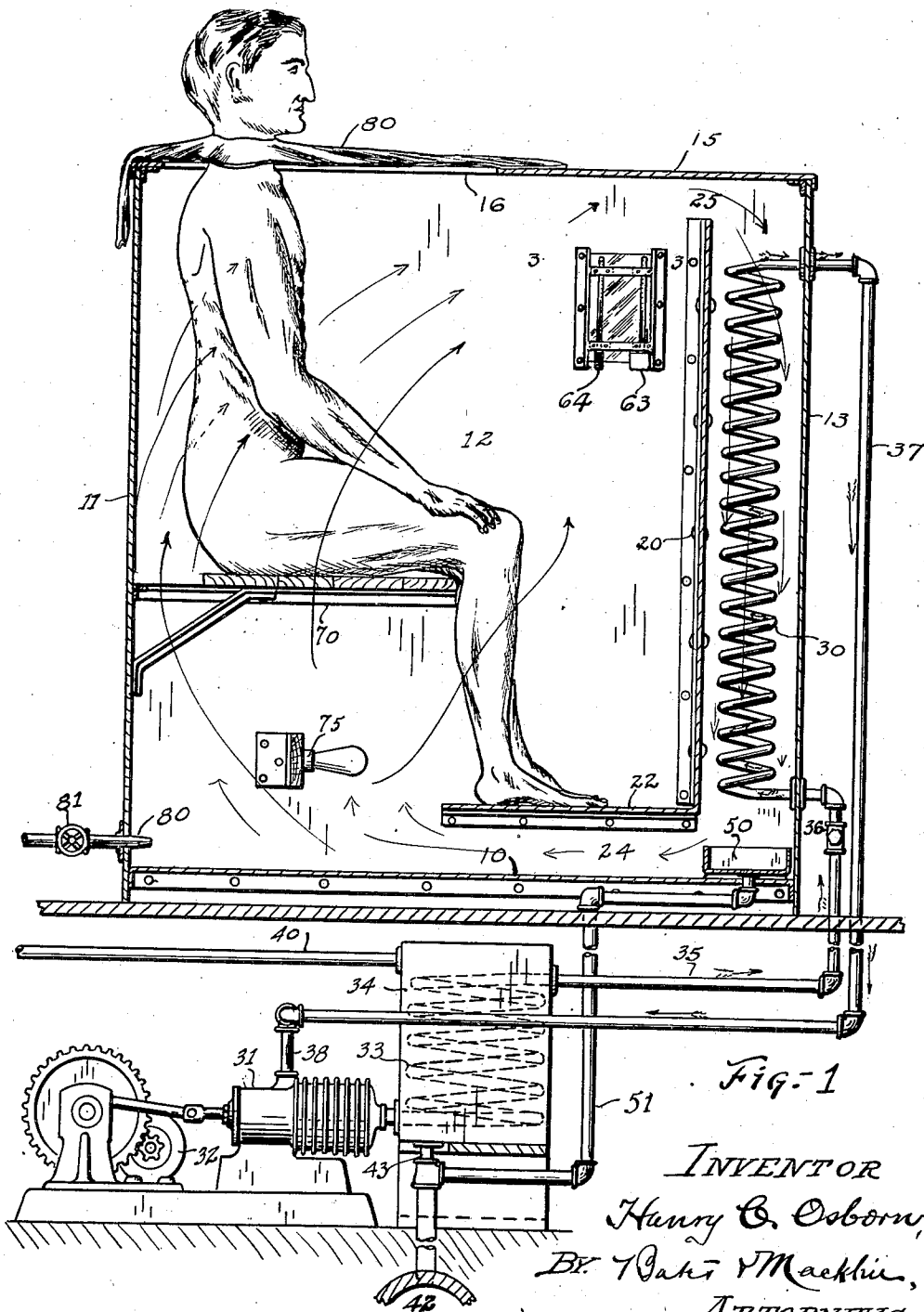
1,476,460

H. C. OSBORN

THERAPEUTIC CABINET

Filed Nov. 4, 1920

2 Sheets-Sheet 1



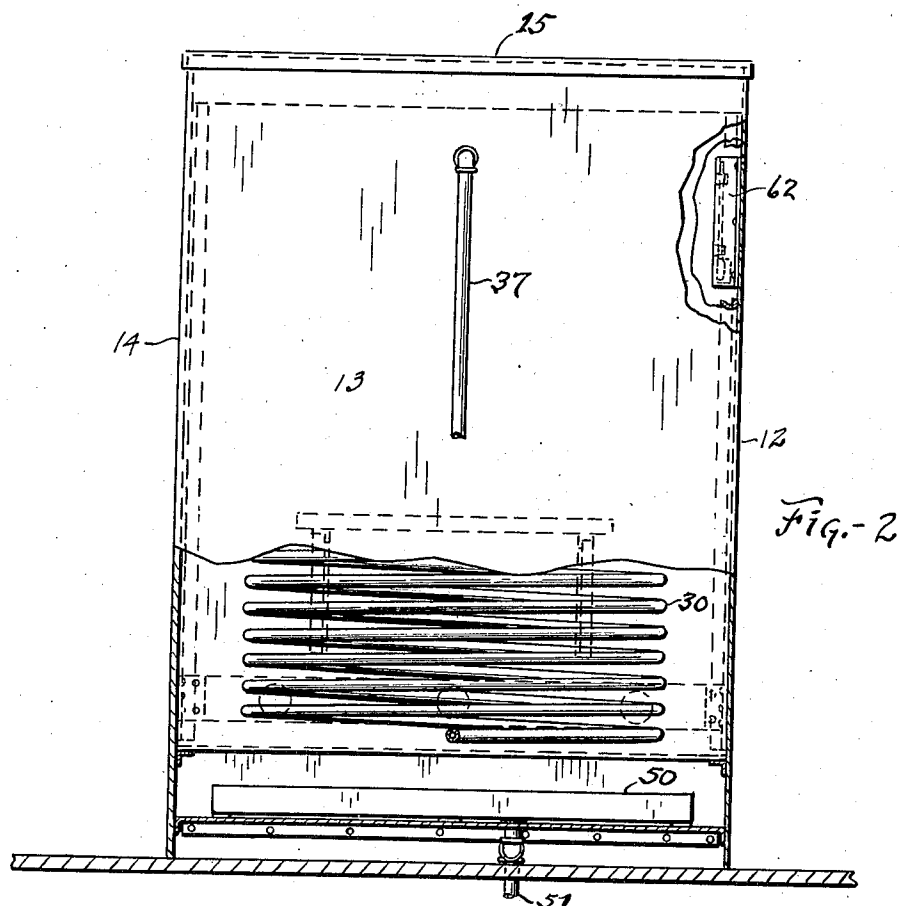
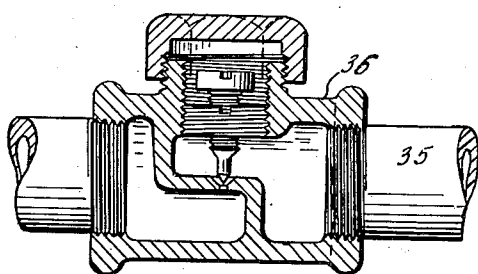
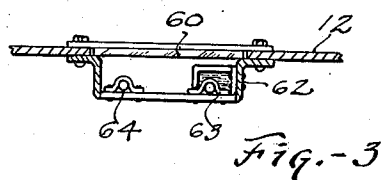
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

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THERAPEUTIC CABINET.

Application filed November 4, 1920. Serial No. 421,623.

To all whom it may concern:

Be it known that I, HENRY C. OSBORN, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Therapeutic Cabinets, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

It has been discovered in the treatment of certain diseases that very beneficial results may be obtained by subjecting the patient to a sudden change of humidity. The shock to the skin tissues, caused by such sudden change, apparently stimulates the circulation and relieves the nerve tension. It has been difficult, however, to effectively cause the sudden change in humidity, and it has been found that a gradual change does not produce the desired results.

The object of this invention is to provide a simple and effective apparatus for enabling the patient to be subjected comparatively suddenly to an atmosphere having a humidity widely different from the general humidity at that time and place. I have discovered that I can produce the desired result by freezing the moisture in a confined chamber, to which the patient may have access. By making the cabinet walls of material allowing free transmission of heat to the interior, at the time the freezing operation is going on, I find that the temperature in the atmosphere about the patient is not materially reduced; or, it may be kept constant by the addition of suitable heat, or both methods of maintaining it may be employed simultaneously.

To the above ends I have provided a cabinet which may be occupied by the patient, and which contains a cooling coil from a suitable refrigerating system, the parts being so arranged that the air recirculates across the cooling coil and thru the space to be occupied by the patient. I find that I obtain the best results by making the cabinet with closed bottom and walls, the patient obtaining access thru the top, as I find leakage at the top has little effect on changing the humidity. I provide a suitable electric heater in the form of an electric bulb, which may be used, if desired to maintain the temperature absolutely constant.

In arranging for the use of such an apparatus, the entrance opening in the top is temporarily closed, and the refrigeration

started, for instance, by allowing compressed ammonia gas or sulphurous oxide to expand within the coil in the cabinet. I find that in a short time, I may thus reduce the humidity from substantial saturation to less than half saturation. A suitable hygrometer is provided in the apparatus which indicates when the proper reduction in humidity has been obtained. By reason of the free radiation I find that the reduction of humidity is accomplished by a fall of only a degree or two of temperature, and even this may be avoided by the use of the electric heater.

The above and other features of the apparatus will be clear from a detail description of a preferred embodiment shown in the drawings hereof.

In the drawings, Fig. 1 is a vertical central section of my therapeutic cabinet, showing also somewhat diagrammatically a refrigerating apparatus; Fig. 2 is an elevation partly broken away at right angles to Fig. 1; Fig. 3 is a detail in cross section substantially on the line 3—3 of Fig. 1, illustrating the hygrometer and thermometer which may be carried within the apparatus in position to be visible from the exterior; Fig. 4 is an enlarged cross section thru an expansion valve for the refrigerating system.

As shown in Figs. 1 and 2, the cabinet is preferably a rectangular casing which has a bottom 10, and four walls 11, 12, 13 and 14, and a top 15, having an entrance opening 16, the cabinet being closed except for this opening. The bottom, top and walls may be conveniently made of sheet metal, as shown in the drawings, or may be made of other material, as desired. It is preferable, however, to have the walls also arranged as to allow free transmission of heat to the interior so that the temperature is not materially reduced by the refrigerating coil.

Within the cabinet I provide a transverse partition 20 extending between the walls 12, and 14, and terminating short of the bottom and top. At the bottom, I provide a short horizontal platform 22 connected with the transverse partition and located a suitable distance above the floor 10. The space 24 below the platform 22 and the space 25 above the partition 20 provide passageways from the body of the chamber to the restricted space between the partition 20 and the wall 13. Within such restricted space I provide the cooling coils, I have shown such cool-

ing coils as a continuous helix 30 with each loop flattened, though any other form of coil may be employed, as desired.

In Fig. 1, I have indicated at 31 a suitable compression machine operated by a motor 32. The discharge end of this compression machine is connected with a suitable coil 33, which occupies a cooling chamber, and from this coil passes a pipe 35 thru an expansion valve 36 to the coil 30. From the top of the coil a return pipe 37 leads back to the compression machine at 38. Suitable cooling water is admitted thru a pipe 40 to the chamber 34 and passes from thence thru a pipe 43 to the sewer indicated at 42. This particular form of refrigerating apparatus is shown simply as illustrative of any convenient form.

Thru one of the walls of the cabinet, preferably adjacent to the upper portion of the partition 20, I provide a window closed by a glass 60. Within the cabinet, behind this window, is secured to the wall a suitable holder 62 supporting a hygrometer 63 and a thermometer 64. Suitably supported within the cabinet is a seat for the patient, such seat being shown at 70 secured to and supported by the wall 11. Beneath this seat I provide one or more electric lamp sockets 75 with suitable circuits leading to the exterior for attachment to the ordinary electric terminal.

With such an apparatus as described, the entrance opening 16 is temporarily closed and the refrigeration started. The air in the comparatively confined chamber occupied by the coil becomes cool and descends, and the air in the main chamber passes thru the passageway 25 into this confined chamber. I thus obtain a continuous circulation of air as indicated by the arrows. The cooling coil freezes the moisture carried by this air, so that the humidity rapidly drops. I have found, for instance, that I can thus reduce the humidity from 95% saturation to 45% saturation in about fifteen minutes.

When a sufficient degree of dryness has been obtained, as indicated by the hygrometer, the apparatus is ready for use; the temporary cover is then removed, and the patient steps into the cabinet from a suitable outside support thru the opening 16 and sits on the seat 20 with his feet on the platform 22, his head being above the top 15. A suitable cape 80 is then placed about the neck of the patient and allowed to extend beyond the opening 16 to form something of a closure therefor. It has been found that when a patient is thus placed for a few minutes within the cabinet the desired shock to the skin tissues is obtained. Ordinarily the slight reduction in temperature is immaterial, but to maintain it constant, current is simply turned onto the lamps 75.

In the operation of my apparatus, the

moisture from the air within the cabinet becomes frozen on the coil 30. At the end of the operation as the refrigeration ceases this frost melts, and to receive and convey it away, I provide a trough 50 below the coil which is connected by a pipe 51 with the sewer.

On occasions when the surrounding atmosphere is very dry it may be desirable to cause the desired skin shock by suddenly subjecting the patient to a moist atmosphere. My cabinet may be availed of for this purpose by simply connecting a steam pipe to it. At Fig. 1, I have indicated such steam pipe at 80 discharging beneath the seat 70 and controlled by a suitable valve 81. When the steam is employed the refrigerating apparatus is ordinarily idle, although it may be employed to preserve the temperature. By means of the available steam and the freezing coil I may raise or lower the humidity as desired.

Having thus described my invention, I claim:

1. The combination, of a chamber having heat transmitting walls and adapted to substantially house a patient, and means for freezing moisture in the air within the chamber to reduce its humidity, whereby the humidity may be altered without materially altering the temperature in the cabinet.

2. The combination, of a chamber having heat transmitting walls adapted to substantially house a patient, means for causing circulation of air thru said chamber and about the patient, and means for freezing moisture in such air to thereby reduce the humidity, without materially altering the temperature in the cabinet.

3. The combination, of a cabinet adapted to substantially house a patient with his head outside of the cabinet, a seat within said cabinet, there being provision for circulation of the air in the cabinet about a patient on said seat, and a cooling coil across which such air passes.

4. The combination, of a cabinet having heat transmitting walls and having an opening at the top thru which access may be obtained for the patient, the cabinet being constructed to support the patient with his head outside of the cabinet, means for substantially closing the space around the patient's neck at the top of the cabinet and a cooling coil arranged to freeze moisture of the air within the cabinet.

5. The combination, of a cabinet having heat transmitting walls and having an opening at the top thru which access may be obtained for the patient, a seat adapted to support the patient within the cabinet with the patient's head outside of the cabinet, and a cooling coil arranged to freeze moisture of the air within the cabinet.

6. The combination, of a cabinet adapted

to substantially house a patient, a seat within said cabinet, a foot support within the cabinet, there being an air passageway beneath the foot support and around the patient, a cooling coil across which such air passes.

7. In a cabinet of the class described, the combination, of a chamber adapted to house a patient, a cooling coil, and a partition between the cooling coil and the space occupied by the patient, there being communicating passageways between space for the patient and space for the cooling coil above and below the partition respectively.

8. In combination, a cabinet having an entrance opening at the top, a partition across the cabinet terminating short of the top and the bottom thereof, a freezing device in the space between the partition and a wall of the cabinet, there being room for the patient within the cabinet on the other side of such partition.

9. The combination, of a cabinet having an entrance opening, a vertical partition across the cabinet terminating short at the top and the bottom thereof, and located comparatively near one wall of the cabinet, a cooling coil in the space between the partition and such near wall of the cabinet, there being room for the patient between such partition and the distant wall of the cabinet.

10. The combination, of a cabinet having four walls, and a top with an entrance opening, a seat within the cabinet beneath the opening, a foot rest within the cabinet below and in front of the seat, said parts being arranged to allow admission of the patient thru the top and his support in a sitting posture with his head above the top of the cabinet, and means for circulating the air within the cabinet and at the same time freezing the moisture to reduce the humidity.

11. In an apparatus of the class described, the combination, of a cabinet having an entrance opening at the top, a partition across the cabinet a distance from one side sufficiently to allow space to receive the patient with his head outside the cabinet, a seat within the cabinet to so support the patient, a foot rest within the cabinet adjacent to the lower end of said partition, there being free communication below the foot rest and above the partition to the space behind the partition, and a cooling coil in such space.

12. The combination, of a cabinet adapted to house a patient to be treated, a heating device within the cabinet, a cooling coil within the cabinet, and a partition separating the cooling coil from the space occupied by the patient, whereby air is circulated across the patient, the cooling coil and the heater.

13. The combination, of a cabinet having

four walls, and a top with an entrance opening, a seat within the cabinet beneath the opening adapted to support the patient in a sitting posture with his head above the top of the cabinet, and means for circulating the air within the cabinet and at the same time freezing the moisture to reduce the humidity, and a heating device within the cabinet adapted to preserve the temperature constant, notwithstanding the freezing of the moisture.

14. In a cabinet of the class described, the combination, of a chamber adapted to house a patient, a cooling coil, a partition between the cooling coil and the space occupied by the patient, there being communicating passageways between space for the patient and space for the cooling coil above and below the partition respectively, and means located below the cooling coil for conveying away liquid dropping from the coil.

15. The combination, of a cabinet having four walls, and a top with an entrance opening, a seat within the cabinet beneath the opening, a foot rest within the cabinet below and in front of the seat, said parts being arranged to allow admission of the patient thru the top and his support in a sitting posture with his head above the top of the cabinet, a coil, piping and apparatus to freeze the moisture in the air within the cabinet to reduce the humidity, a trough for liquid below the refrigerating coil, and means for conveying away the liquid from said trough.

16. In a device of the character described, the combination of a chamber adapted to substantially house a patient, means for freezing moisture in the air within the chamber to reduce its humidity, there being means for maintaining the temperature in the chamber as a whole substantially constant whereby the patient may be subjected to an altered humidity without a materially altered temperature.

17. The combination of a chamber adapted to substantially house a patient, means for freezing moisture in the air within the chamber to reduce its humidity, and means for adding heat within the chamber to prevent undue reduction of the temperature of the air.

18. The combination of a chamber adapted to substantially house a patient, means for causing a circulation of air through said chamber and about the patient, means for freezing moisture in such air to thereby reduce its humidity, and means for supplying heat to such air.

19. The combination of a chamber adapted to substantially house a patient, means for causing circulation of air through said chamber and about the patient, means for freezing moisture in such air to thereby re-

duce the humidity, and a heating device within said chamber to counteract the reduction of temperature therein due to the freezing operation.

- 5 20. A means for decreasing the humidity within a confined space comprising the combination of confining means, means for freezing some of the moisture in the air

therein, and means for supplying heat to such air sufficiently to substantially counter- 10 act the lowering temperature due to the freezing.

In testimony whereof, I hereunto affix my signature.

HENRY C. OSBORN.