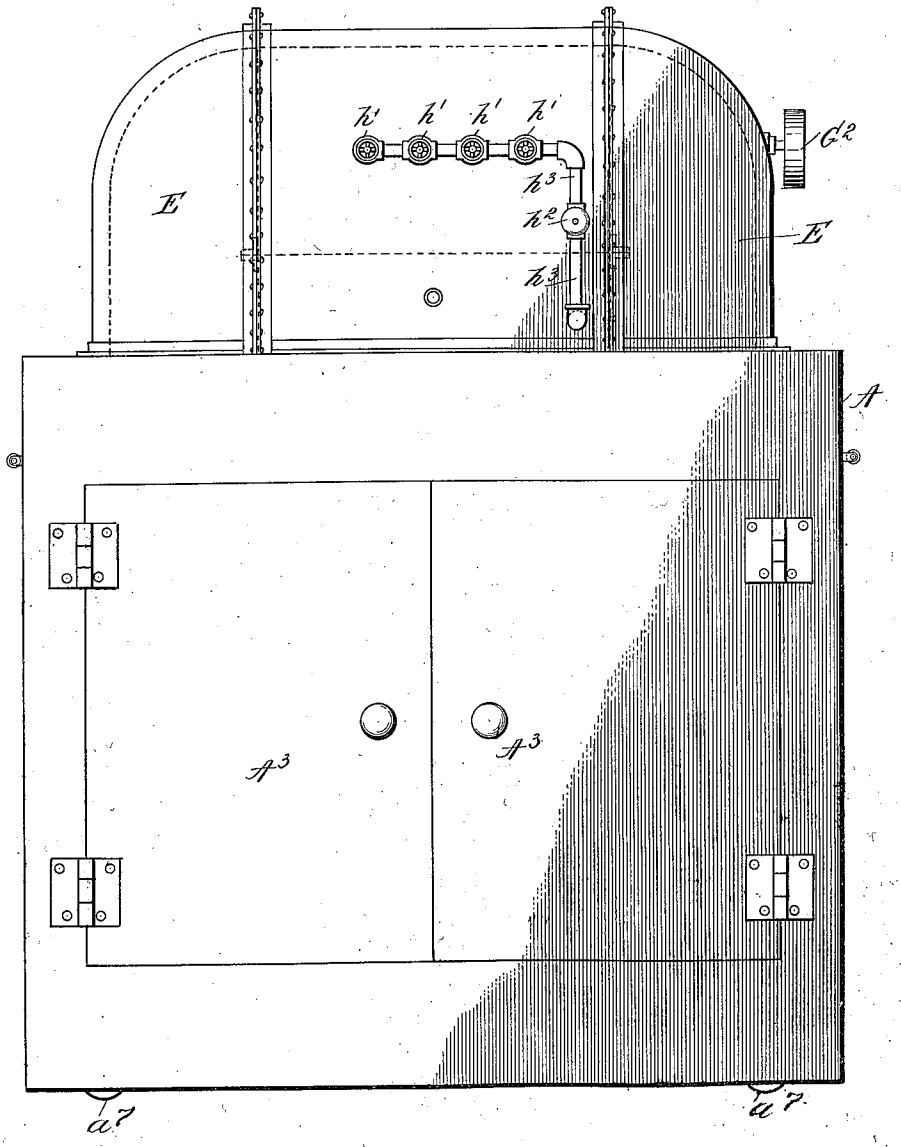
Nov. 9, 1926. 1,606,363

D. P. GOSLINE

MACHINE FOR TREATING MATERIALS WITH AIR

Original Filed August 9, 1920 4 Sheets-Sheet 1

Fig. 1.



INVENTOR:
Daniel P. Gosline

By Coale & Hayes
ATTORNEYS:

Nov. 9, 1926.

1,606,363

D. P. GOSLINE

MACHINE FOR TREATING MATERIALS WITH AIR

Original Filed August 9, 1920 4 Sheets-Sheet 2

Fig. 2.

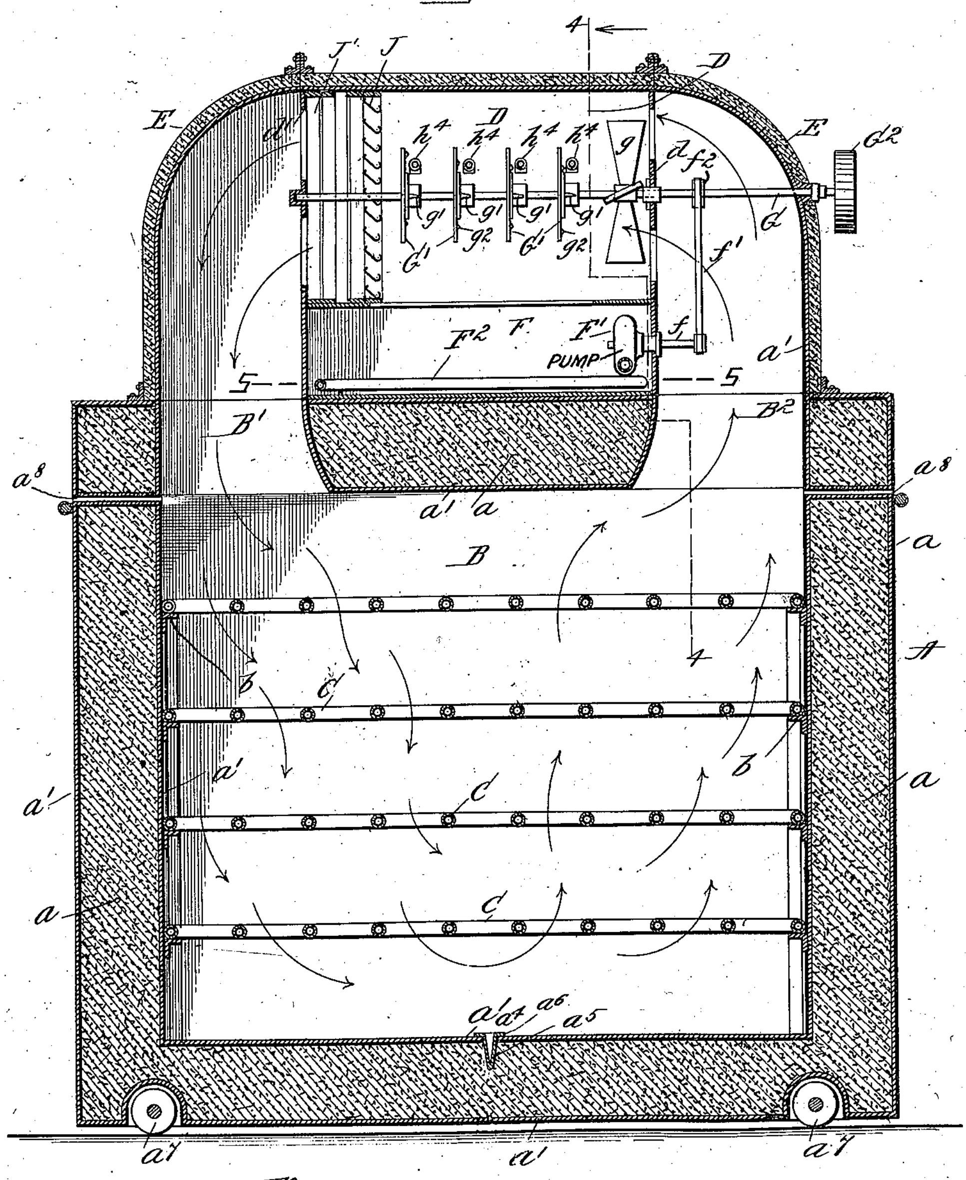
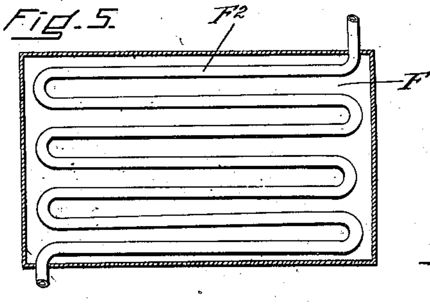


Fig. 5.



INVENTOR:
Daniel P. Gosline

By Coale & Mayer
ATTORNEYS:

Nov. 9, 1926. 1,606,363

D. P. GOSLINE

MACHINE FOR TREATING MATERIALS WITH AIR

Original Filed August 9, 1920 4 Sheets-Sheet 3

Fig. 3.

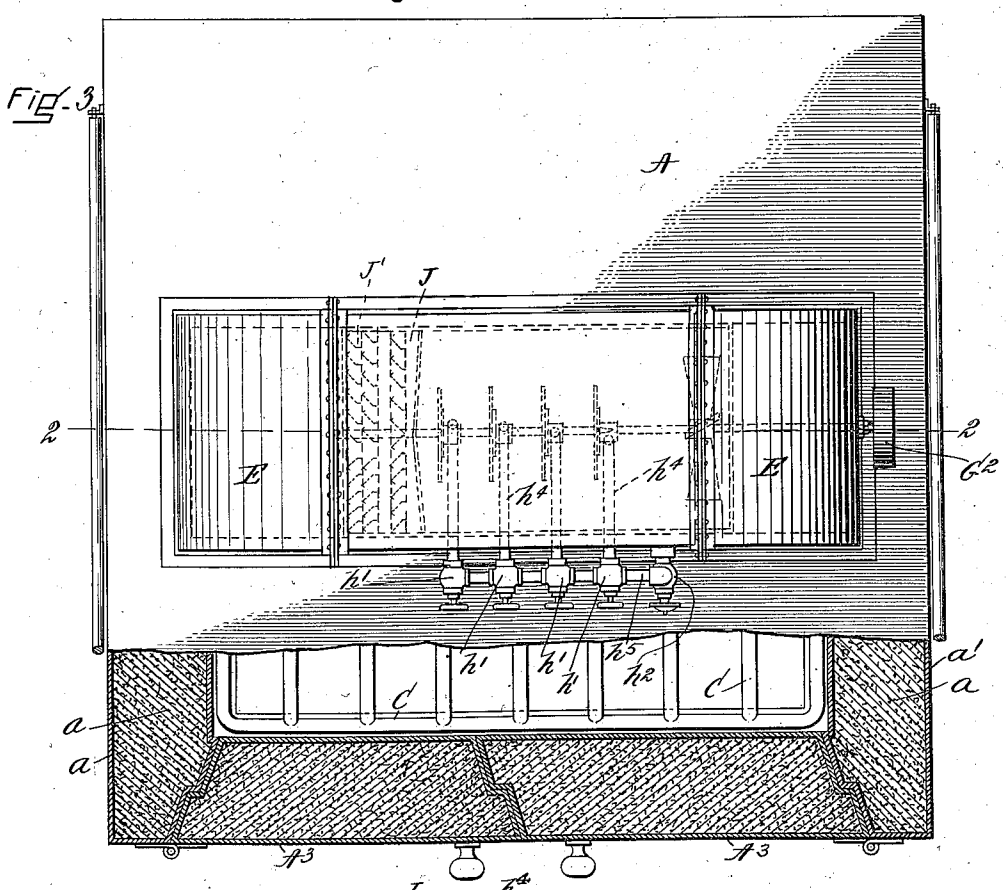
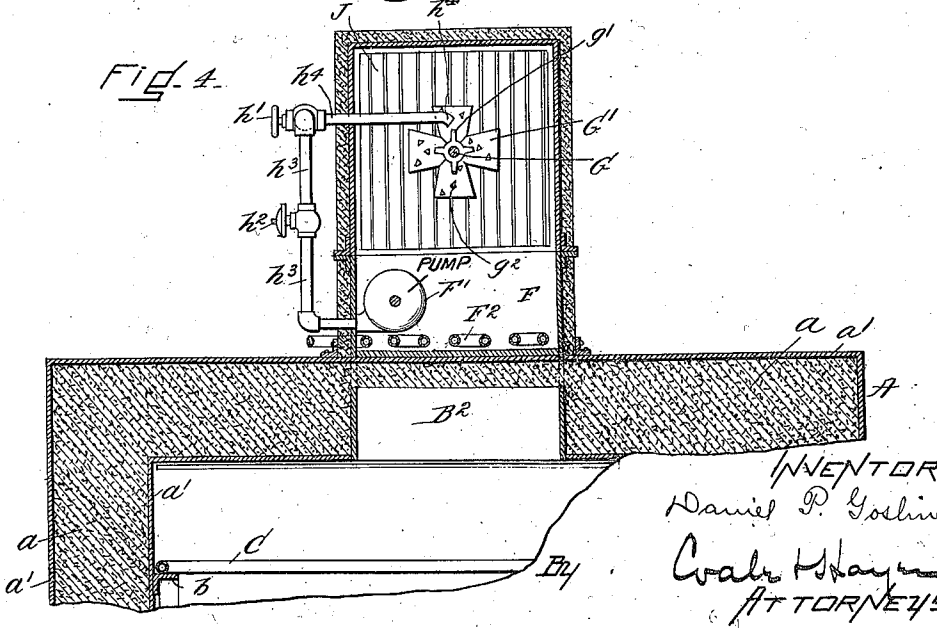


Fig. 4.



INVENTOR:
Daniel P. Gosline
Coats & Hayes
ATTORNEYS:

Nov. 9, 1926. 1,606,363

D. P. GOSLINE

MACHINE FOR TREATING MATERIALS WITH AIR

Original Filed August 9, 1920 4 Sheets-Sheet 4

Fig. 6.

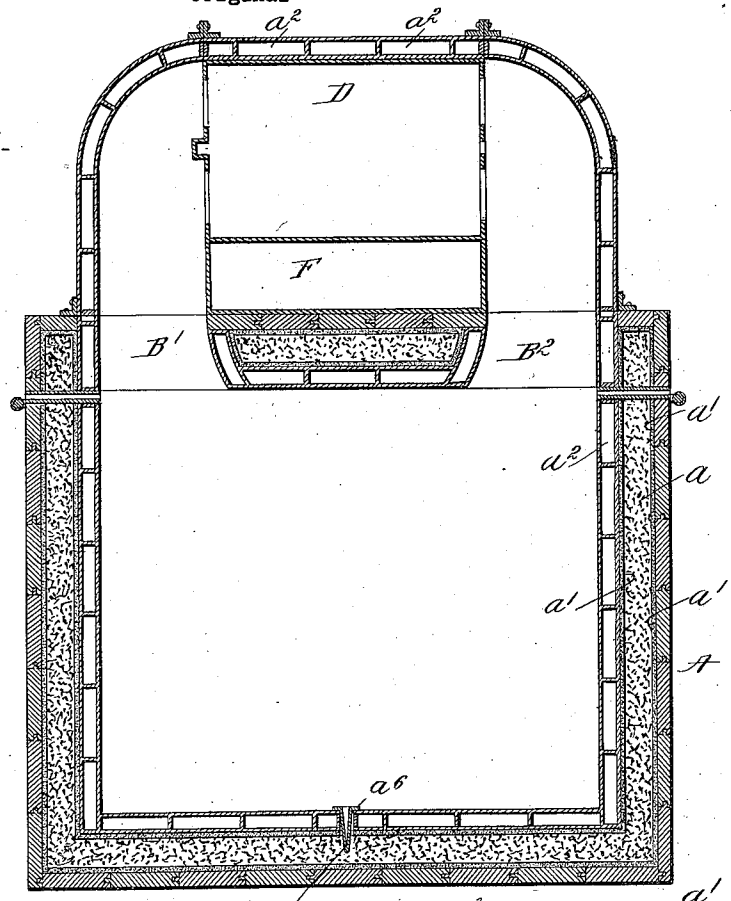


Fig. 7.

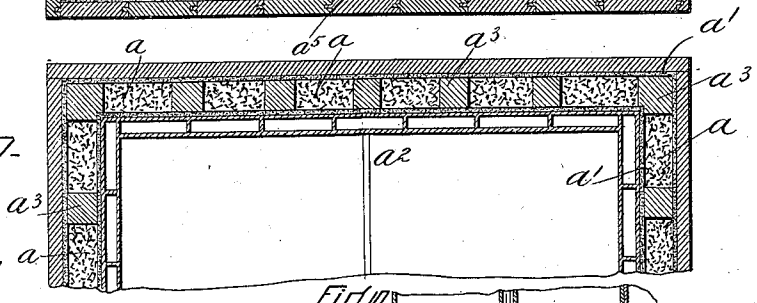


Fig. 8.

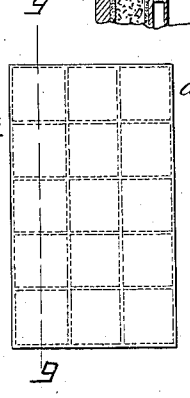


Fig. 9.

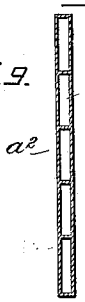


Fig. 10.

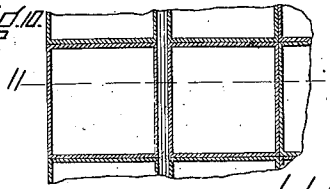
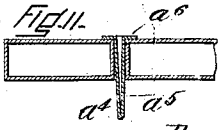


Fig. 11.



INVENTOR:
Daniel P. Gosline
By Coale & Hayes
ATTORNEYS.

Patented Nov. 9, 1926. 1,606,363

UNITED STATES PATENT OFFICE.

DANIEL P. GOSLINE, OF BOSTON, MASSACHUSETTS.

MACHINE FOR TREATING MATERIALS WITH AIR.

Application filed August 9, 1920, Serial No. 402,415. Renewed October 1, 1926.

The present invention relates to a machine by which material may be subjected to the influence of conditioned air. By conditioned air I mean air which is in a predetermined condition of temperature or moisture.

The essential object of my invention is to provide a machine portable in character in the sense of its being capable of placement in any desired position or the position thereof changed.

It is a further object of my invention to provide a machine capable of use under varying extremes of either heat or cold, or varying humidity, as occasion may require.

My invention can best be seen and understood by reference to the drawings in which it is shown in its preferred form, and in which—

Fig. 1 is a front elevation.

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

Fig. 3 is a plan or top view partly in section.

Fig. 4 is a fragmentary section on line 4—4 of Fig. 2.

Fig. 5 is a section on line 5—5 of Fig. 2.

Fig. 6 is a vertical section similar to Fig. 2 but showing a different type of insulation.

Fig. 7 is a horizontal fragmentary section of the casing shown in Fig. 6.

Fig. 8 is an elevation of a portion of the type of insulation shown in Fig. 6.

Fig. 9 being a section on line 9—9 of Fig. 8.

Fig. 10 shows in plan a portion of the expansion joint, and

Fig. 11 a section on the line 11—11 of Fig. 10.

A is a casing or box forming within it a chamber B. All of the walls including the top and bottom are insulated by some form of heat insulation indicated at a in the various figures, the casing being made preferably of outer and inner plates a^1 of sheet metal between which the insulation is put as shown. In Fig. 6 there is an added insulation comprising air chambers indicated at a^2 of the character described in Letters Patent to me, No. 1,139,672. In Fig. 7 the insulation a is located between uprights a^3. The insulation may be used wherever desired.

Within the chamber B of the casing is a frame b of angle iron which is made independent of the casing and upon which rest shelves or grids or other supports C for the material to be treated, the kind of support depending upon the material, and in any event being of such character as to allow for a free circulation of air throughout the chamber of the casing and material contained within it. The frame b is made independent of the casing in order that it and the material carried by it may be removed if desired from the chamber of the casing, or inserted therein, as occasion may require. The frame is also made independent of the casing in order to permit of the expansion and contraction of the interior walls of the casing. The walls are made of metal and will be subjected to extreme variations in temperature of from 10° to 20° Fahrenheit below zero for the treatment of some kinds of material, and from 120° to 150° Fahrenheit for the treatment of other materials. Accordingly the walls must be permitted to expand or contract.

To permit also of the expansion and contraction of the walls there is provided also an expanding and contracting joint a^4 between certain spaced portions thereof as illustrated in Fig. 2. This joint comprises a strip of metal, the body a^5 of which is bent V-shaped, and the upper free ends of which are provided with flanges a^6. The body of the joint is passed down through the narrow opening left between certain disconnected parts of the wall with the flanges a^6 overlapping the edges of the disconnected parts. The arrangement permits of an ample expansion or contraction of the casing wall, the joint at the same time acting to keep the chamber tight.

The top of the casing A is provided with two openings B^1 and B^2 and on top of the casing and between these openings is set the air-conditioning mechanism. This mechanism comprises a box D having openings in its end walls d^1 closed at its sides, and attached to the chamber by curved walls E which are insulated and form with the conditioning mechanism air ducts through which the air may be caused to circulate. The joints should all be air tight.

Beneath the box D is a tank F for the liquid in which is located a pump F^1 connected by a shaft f and belt f^1 with a pulley f^2 on a shaft G. A coil F^2 connected to a suitable supply of heating or chilling fluid is located in the tank F to supply the required temperature to the liquid therein.

The shaft G is mounted in the end walls of the box D and carries a fan g and also

breaker plates G^1, the shaft being rotated by power applied to the pulley G^2 or otherwise. The breaker plates G^1 are shown in edge view in Fig. 2 and in front view in Fig. 4 where it will be noted that the hub of each carries radial flanges g^1 and the breaker plates carry projections g^2. The pump F^1 has connected with it a pipe h^3 in which is a valve h^2 and also valves h^1 from each of which runs a pipe h^4 to deliver liquid from the pump to the rotary breaker plates.

J are horizontal and J^1 are vertical baffle plates located in the path of the air, which strip the air of any moisture, the moisture so collected dripping back into the tank F.

The mechanical operation of this machine will be readily understood. Power being applied in any convenient way to the pulley G^2 will rotate the shaft G thus operating the pump F^1 and also the fan g as well as the breaker plates G^1. The stream of liquid thrown by the pump F^1 through the pipes h^4 is controlled according to the particular requirement by the valves h^1, by which the flow of liquid to each particular pipe may be adjusted according to the circumstances. The valve h^2, which controls the connection between the pump and all the pipes is for manual control by which well known method the liquid is shut off or permitted to flow as conditions require. The rotation of the fan g draws the air through the opening B^2 and openings in the wall d causing it to pass through the chamber D and out through the opening in the wall d^1 and back through the duct B^1 into the chamber B where it circulates through the shelves or supports C and the articles placed or hung in the enclosed chamber.

According to process as described in my said patent, moisture can be taken out of the air by chilling and hence in the preferred way of utilizing this apparatus, if it is desired, for example, to dry and chill any material, air is drawn up through the duct B^2 and is passed through a spray or mist in the chamber D pumped by pump F^1 from the tank F. This tank is provided with liquid at any desired low temperature and kept at that temperature while in the tank by means of a coil F^2. A proper amount of liquid being supplied to the pipes h^4 it falls from said pipes on to the breakers G^1 and is thrown by the impact of the breakers centrifugally outward so as to fill the passage in the casing D with clouds of mist or spray of high velocity, which will be driven into the column of passing air. By this means the volume of air is thoroughly treated and chilled and consequently drops part of its moisture, or if treated with heated water it absorbs moisture as the case may require. The air is impelled against the baffles J, J^1, which collect any free moisture from the treated air and this settles down into the tank F. In freezing fish, or hardening ice cream or in similar work, this process is kept up using very low temperatures gradually taking the moisture from the surface of the goods placed for treatment, preferably by the use of calcium brine and gradually chilling the material as the temperature in the coil F^2 is maintained to reduce the temperature in the tank F, so that eventually the material is frozen or sufficiently chilled without being covered with ice or frozen to the shelves on which they are placed.

For the purpose of removing material from the chamber B the insulated casing or box is provided with insulated doors A^3 of the refrigerator type, and to move the machine about, and for meeting the special requirements of portability the machine is preferably mounted on wheels or castors a^7. Textiles, skeins of yarn, or cloth may be treated in this apparatus, as well as other materials which require drying or moistening.

What I claim as my invention is:

1. A machine of the type described comprising an airtight insulating casing enclosing a chamber and having mounted thereon an enclosed air-conditioning device having a passage therethrough, said casing having openings on each side of said device, airtight connections between the wall defining each opening and the walls defining each end of said passage, means for causing air to be forcibly passed through said passage, and means located in said passage to saturate said air with moisture.

2. A machine of the type described comprising an airtight insulating casing enclosing a chamber and having mounted thereon an enclosed air-conditioning device having a passage therethrough, said casing having openings on each side of said device, airtight connections between the wall defining each opening and the walls defining each end of said passage, means for causing air to be forcibly passed through said passage, and means located in said passage whereby liquid in controllable quantities may be forced into said air as it passes through said passage.

3. A machine of the type described comprising an airtight insulating casing enclosing a chamber and having mounted thereon an enclosed air-conditioning device having a passage therethrough, said casing having openings on each side of said device, airtight connections between the wall defining each opening and the walls defining each end of said passage, means for causing air to be forcibly passed through said passage, means located in said passage whereby liquid in controllable quantities may be forced into said air as it passes through said passage, and means whereby

the temperature of said liquid may be controlled.

4. A machine of the type described comprising an airtight insulating casing enclosing a chamber and having mounted thereon an enclosed air-conditioning device having a passage therethrough, said casing having openings on each side of said device, airtight connections between the wall defining each opening and the walls defining each end of said passage, means for causing air to be forcibly passed through said passage, and means located in said passage to saturate said air with moisture, said last-named means comprising a tank located to receive the surplus liquid which has been forced through the air and has not been taken up by it and pipes located therein connectable to a temperature-changing means and means for forcibly delivering the liquid from said tank into said air.

DANIEL P. GOSLINE.