April 8, 1924. 1,489,780

C. A. MOORE

VENTILATOR

Filed Jan. 22, 1920

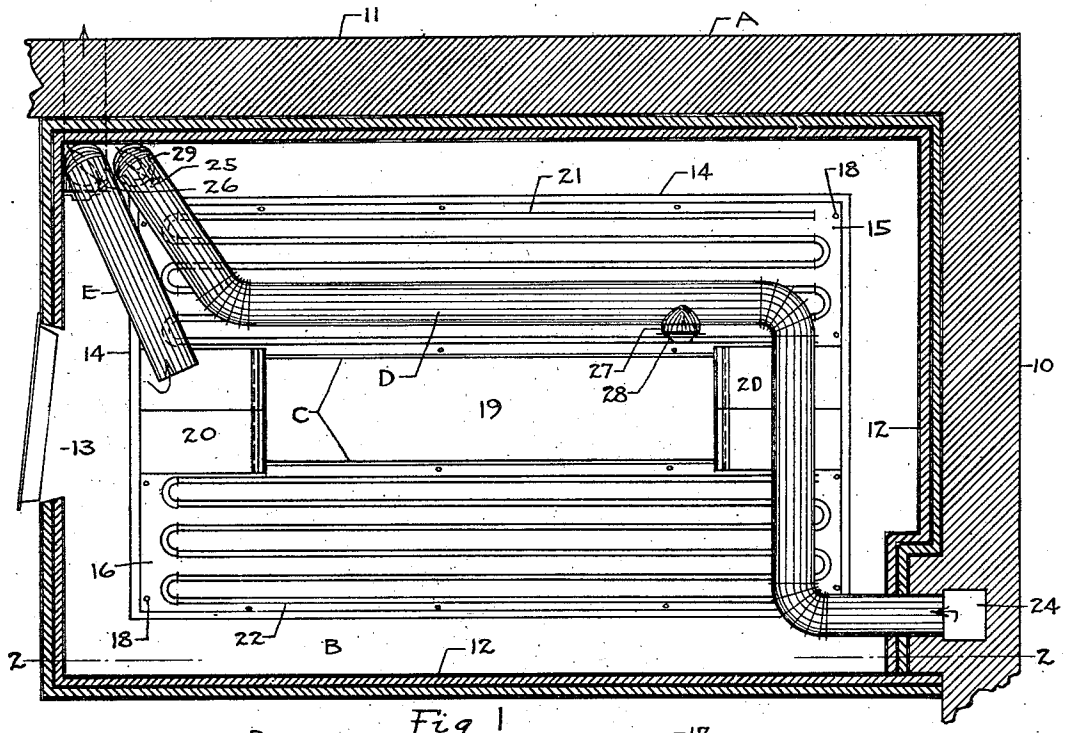

Fig 1

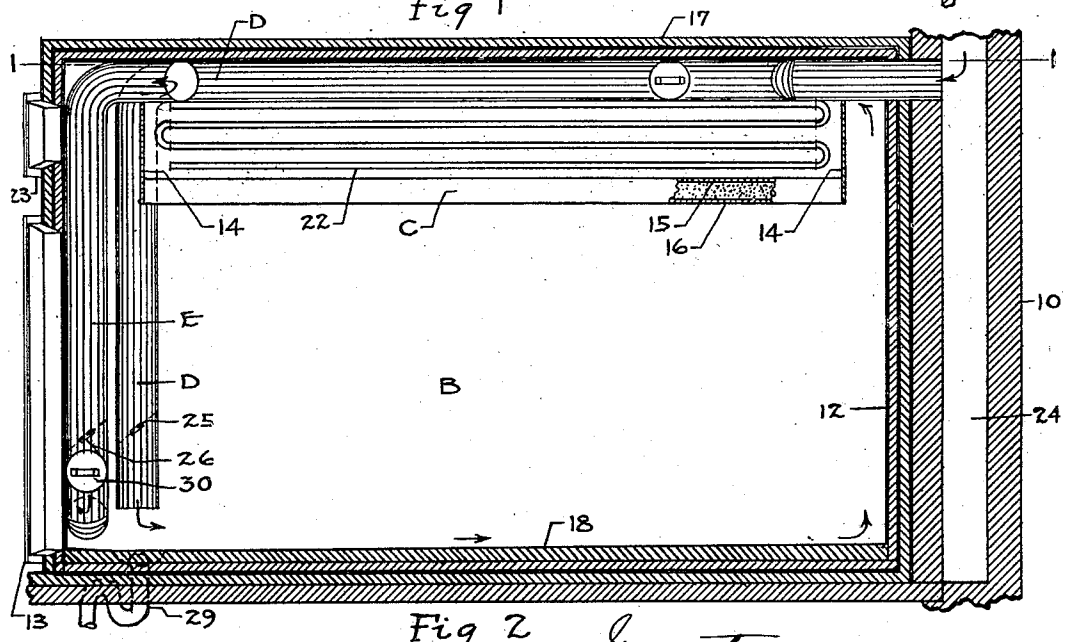

Fig 2

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UNITED STATES PATENT OFFICE.

CHARLES A. MOORE, OF ST. PAUL, MINNESOTA.

VENTILATOR.

Application filed January 22, 1920. Serial No. 353,267.

To all whom it may concern:

Be it known that I, CHARLES A. MOORE, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented a new and useful Improvement in Ventilators, of which the following is a specification.

This invention relates to ventilators for use in refrigerators, the primary object being to provide a refrigerator in a receptacle, vehicle or ship or any other structure with a ventilator which will most effectively cause a well defined circulation of pure cold air not overladen with moisture throughout the entire provision chamber of the structure. It is a well known fact that even though a cold temperature is produced in a refrigerator, if the air is charged with too much moisture, the perishable goods in the structure are damaged and not preserved in proper condition. It is therefore the primary object of this invention to maintain the refrigerated air in the structure in dry condition as well as cold.

With these and other objects in view, my invention comprises the features of construction and combination of parts hereinafter described and claimed.

In the accompanying drawing forming part of this specification, Fig. 1 is a horizontal section through a provision chamber taken on the line 1—1 of Fig. 2, showing my invention applied to a stationary structure, although it will be understood that my invention contemplates applying my improvement to structures of any kind, wherein a refrigerator is employed, and Fig. 2 is a longitudinal vertical section taken on the line 2—2 of Fig. 1.

In the drawing A indicates a portion of a stationary building structure, having the usual walls 10 and 11 within which is constructed a provision chamber B having side and end insulated walls 12, through one of which is the entering doorway 13. Arranged within the provision chamber is an overhead bunker C, comprising baffle walls 14 distanced from the walls of the provision chamber and secured to the insulated drain floors 15 and 16 hung from the insulated ceiling 17 by bolts 18 or any other suitable means. This bunker structure is formed with a central down draft port 19 at the ends of which are guard elements 20 distanced below the ceiling and permitting air to circulate over the ends of the bunker and refrigerant and down through said port. Arranged within the bunker over the drain floors are the refrigerating coils 21 and 22, but it will be understood that my invention contemplates employing any form of bunker for use either with refrigerating coils or with ice. When used with the coils or with ice, entrance to the bunker is had through the doorway 13, which is normally closed by a door 23.

My improved ventilating device includes a duct D connected with the flue 24 in the wall 10 and leading directly over and through the bunker in close proximity to the refrigerant, thence downwardly to a point near the floor 18 of the provision chamber.

A second duct E extends downward from the upper portion of the provision chamber, thence outward through the wall 11. Air supplied through the flue 24 to the reach of the duct D in the bunker is cooled by the refrigerant and descends through said duct to the lower portion of the chamber. Heated at the walls of the chamber and about the lading therein this air rises to the upper portion of the chamber. Being then somewhat colder than the outer atmosphere, said air will fall to the outside through the duct E. The steady down drafts thus produced in the ducts D and E causes a convective and diffused freshening circulation of air within the chamber. Suitable hand operated dampers 25 and 26 are provided respectively in the ducts D and E in convenient position to be turned by an operator standing on the floor of the provision chamber. By adjusting these dampers, the amount of draft and the percentage of moisture in the air in the provision chamber can be regulated from time to time. By regulating these dampers the dryness of the air in the provision chamber can be maintained in prime condition for preserving any lading in said chamber. The entire apparatus is simple and inexpensive in construction, and provides an effective apparatus for accomplishing the results above set forth.

The duct D is also provided with a branch 27 normally closed by stopper 28. When not operating under the action of a refrigerant in the bunker, the stoppers 28 and 30 can be removed and the dampers 25 and 26 closed, in which event the upper stratum of moist air in the room is removed by the circulation of air from the lower end of the

duct E upwardly into the top of the room and outwardly through the branch 27. The moisture laden air thus finds exit through branch 27 and duct D upwardly through flue 24 to the outer atmosphere. Thus the circulation in this instance is in the opposite direction from that when a refrigerant is used, but in both cases the upper stratum of air laden with the highest percentage of moisture is removed from the room. A drain 29 in the floor of the provision chamber is provided below the lower end of duct D, which is adapted to convey the drip resulting from condensation by conducting moist air through duct D and to convey drip from the refrigerant.

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

1. In combination with a lading chamber having a refrigerant in the upper portion thereof, a down draft duct leading from the outer atmosphere in close proximity to said refrigerant to be cooled thereby and having exit to said chamber near its lower portion and a second down draft duct leading from the upper portion downwardly and out of said lading chamber adapted to conduct air laden with a comparatively high percentage of moisture from said chamber to the outer atmosphere.

2. A provision chamber having a refrigerant maintained in the upper portion thereof, a fresh air ingress duct leading from the outer atmosphere into said provision chamber in close association but out of direct contact with said refrigerant to be cooled thereby and having exit to said chamber near its lower portion and a second duct leading from the upper portion of said provision chamber downwardly to the outer atmosphere for conducting air laden with a high percentage of moisture from the provision chamber, said ducts being provided with regulators for adjusting the volume of air passing therethrough.

3. In combination with a chamber having a refrigerant in its upper portion adapted to be maintained or discontinued in use, a duct passing through a substantial portion of its length in near proximity to the refrigerant, said duct having an ingress-egress terminal opening in the outer atmosphere near the upper level of the chamber, a terminal egress opening within the chamber at the lower portion thereof and a valved ingress opening between said terminal openings and in that portion of said duct in the upper portion of the chamber, a damper in said duct at a point between said valved ingress opening and egress opening, a second duct having an ingress terminal opening near the upper portion of the chamber, an ingress-egress terminal opening in the outer atmosphere near the lower level of the chamber and a valved egress opening between said terminal openings, said valved egress opening being located in said second duct at the lower portion of the chamber, a damper in said second duct between the ingress and valved egress openings, said valved ingress and egress openings being closed when the dampers are opened and the refrigerant maintained, whereby fresh cold air is supplied to the lower portion of the chamber through the first duct and the warmer humid air conveyed from the upper portion of the chamber by the second duct, said valved ingress and egress openings being opened when the dampers are closed and the employment of the refrigerant discontinued, whereby fresh air is supplied to the lower portion of the chamber through said second duct and vitiated air conveyed from the upper portion of the room by said first duct.

4. The combination with a refrigerating chamber of a ventilating, dehumidifying apparatus therefor, comprising means for introducing fresh cold air to the lower portion of the chamber and means for removing the upper stratum of air downwardly from said chamber, the air removing action of said second means being stimulated by the effect of the incoming cold air.

5. In combination with a lading chamber having a refrigerant adapted to be maintained or its use discontinued in its upper portion, a down draft duct leading from the outer atmosphere in close proximity to the refrigerant to be cooled thereby and having exit to said chamber near its lower portion, said duct having a valved inlet entering the upper portion of said chamber and being valved on the lading chamber side of said valved inlet therein, and a second down draft duct leading from the upper portion of said chamber downwardly and out of said chamber, said second duct having a valved inlet entering the lower portion of said chamber and being valved on the lading chamber side of said valved inlet therein, whereby provision is made for two independent circulations of air, one providing a cooled down draft of fresh outside air entering the lower portion of the chamber and the warm vitiated air from the upper portion of the chamber expelled downwardly to the outer atmosphere when the refrigerant is maintained and the other providing cool outside fresh air entering the lower portion of the chamber and the warmer vitiated air expelled upwardly to the outer atmosphere when the use of the refrigerant is discontinued.

In testimony whereof, I have signed my name to this specification.

CHARLES A. MOORE.