H. E. LEAVITT.

COOLING APPARATUS.

APPLICATION FILED MAY 7, 1919.

1,393,226. **Patented Oct. 11, 1921**

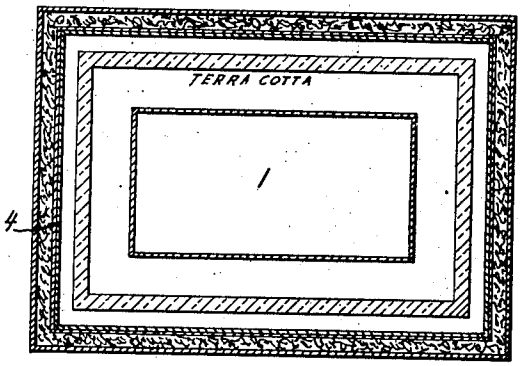


Fig. 2.

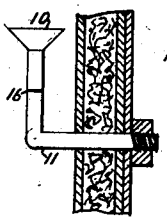


Fig. 3.

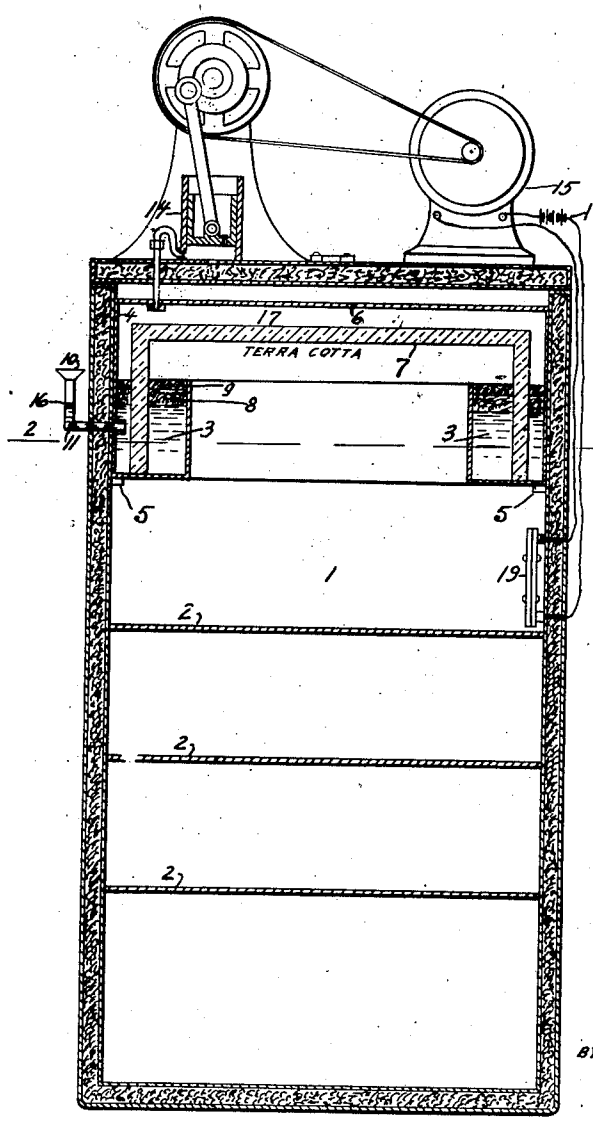


Fig. 1.

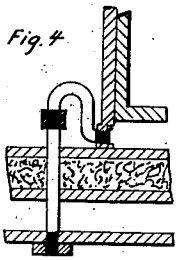


Fig. 4

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COOLING APPARATUS.

1,393,226. Specification of Letters Patent. Patented Oct. 11, 1921.

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To all whom it may concern:

Be it known that I, HENRY E. LEAVITT, a citizen of the United States, residing at Berkeley, in the county of Alameda and State of California, have invented new and useful Improvements in Cooling Apparatus, of which the following is a specification.

The present invention relates to cooling apparatus, the object of the invention being to provide a simple and efficient apparatus of this character, by which a cooling effect can be obtained and maintained by the evaporation of water and without the use of ice.

In the accompanying drawing, Figure 1 is a vertical section of my invention as applied to a domestic refrigerator; Fig. 2 is a horizontal section thereof on the line 2—2 of Fig. 1; Figs. 3 and 4 are enlarged sectional views of details.

Referring to the drawing, 1 indicates a receptacle for containing material which it is desirable to maintain cool, shown in this case as provided with the necessary shelves 2, for supporting the material thereon. In the top of said receptacle is supported on lugs 5 an annular trough 3, the outer wall 4 of said trough being extended upward to a considerable height, and the space between said extended walls 4 being inclosed by a cover 6.

7 indicates a porous partition in the shape of an inverted pan or box of porous material, such as terra cotta, the outline of the partition being similar in form to, but of less dimensions, than the outline of the wall 4. This porous partition 7 is placed with its lower edge on the bottom of the trough and is here shown of such form that said edge is at a uniform distance from the outer wall 4 of the trough.

The spaces between the partition 7 and the inner and outer walls of the trough are closed at the top by a packing 8 of flax, which swells when it becomes wet, and, therefore, makes a very tight packing. This packing is covered with a cement 9 such as is used for covering the tops of corks to prevent evaporation of the contents of bottles. The trough beneath the packing is then filled with water poured into the funnel-shaped mouth 10 of a glass tube 11 which communicates with the interior of the trough below the packing. Preferably on commencing to use the apparatus, salt water is used. The space 17 between the partition 7 and the upper portions of the exterior wall 4 of the trough and the cover 6 communicates through a tube 12 with a vacuum pump 14 preferably driven by an electric motor 15.

The following is the mode of use of my improved cooler. The trough having been filled with water or brine and the pump started, the water ascends by capillarity and permeates the whole of the terra cotta partition and exudes from both surfaces thereof. At the same time, a partial vacuum is created in the compartment 17 between the partition 7 and the cover 6. This vacuum produces a rapid evaporation of the water from the upper surface of the partition 7 and a consequent rapid cooling of the partition. If the vacuum pump is sufficiently powerful, the water will be evaporated as rapidly as it can appear at the surface of the partition. One result of this is that the under side is, therefore, also cooled, and the density of the air thereunder is increased, and it consequently sinks to the bottom of the receptacle 1, its place being taken by warmer air ascending through said receptacle. After a certain time, all of the air in the receptacle 1 has been reduced to, and is maintained at, the temperature of the under side of the partition 7, thus maintaining the contents of the receptacle at the same temperature.

The level of the water in the trough will gradually sink as said water is evaporated, and may be ascertained by inspection of the glass tube 11 on which is marked a red line 16 corresponding to the lower surface of the packing material in the trough, that is, to the effective top of the trough 3.

The cost of the electricity required to run a motor driving a pump necessary to produce the required vacuum is much less in most places than that of the necessary ice and is much more convenient to use in localities where electricity is supplied from a central station. The advantage of my improvement will, therefore, be readily apparent.

When the temperature reaches a predetermined minimum, the electric circuit, which is supplied to the motor from any suitable source of power 18, is cut off by a thermostat 19 of any desired form within the receptacle 1, a conventional form being here shown.

It is understood that various changes in form, proportion, size and minor details of construction, within the scope of the claims, may be resorted to, without departing from

the spirit, or sacrificing any of the advantages, of the invention.

I claim:—

1. In a cooling apparatus, a chamber for containing material to be cooled, a partition of porous material extending across the top of and directly exposed throughout to the interior of said chamber, means for supplying moisture to said partition, means spaced from said partition and independent of said chamber for forming with said porous partition a vacuum chamber, a vacuum pump communicating with said vacuum chamber and means for operating said pump.

2. In a cooling apparatus, a chamber for containing material to be cooled, a partition of porous material of inverted box-shaped form extending across said chamber, a liquid holding trough, in which the lower edge of said partition is inverted, for supplying moisture to said partition, means on the side of said porous partition remote from said chamber for forming with said porous partition a vacuum chamber, a vacuum pump communicating with said vacuum chamber, and means for operating said pump.

HENRY E. LEAVITT.