

Feb. 28, 1933.

L. S. CHADWICK

1,899,852

TEMPERATURE CONTROL MEANS FOR REFRIGERATION COMPARTMENTS

Filed Jan. 29, 1930

3 Sheets-Sheet 1

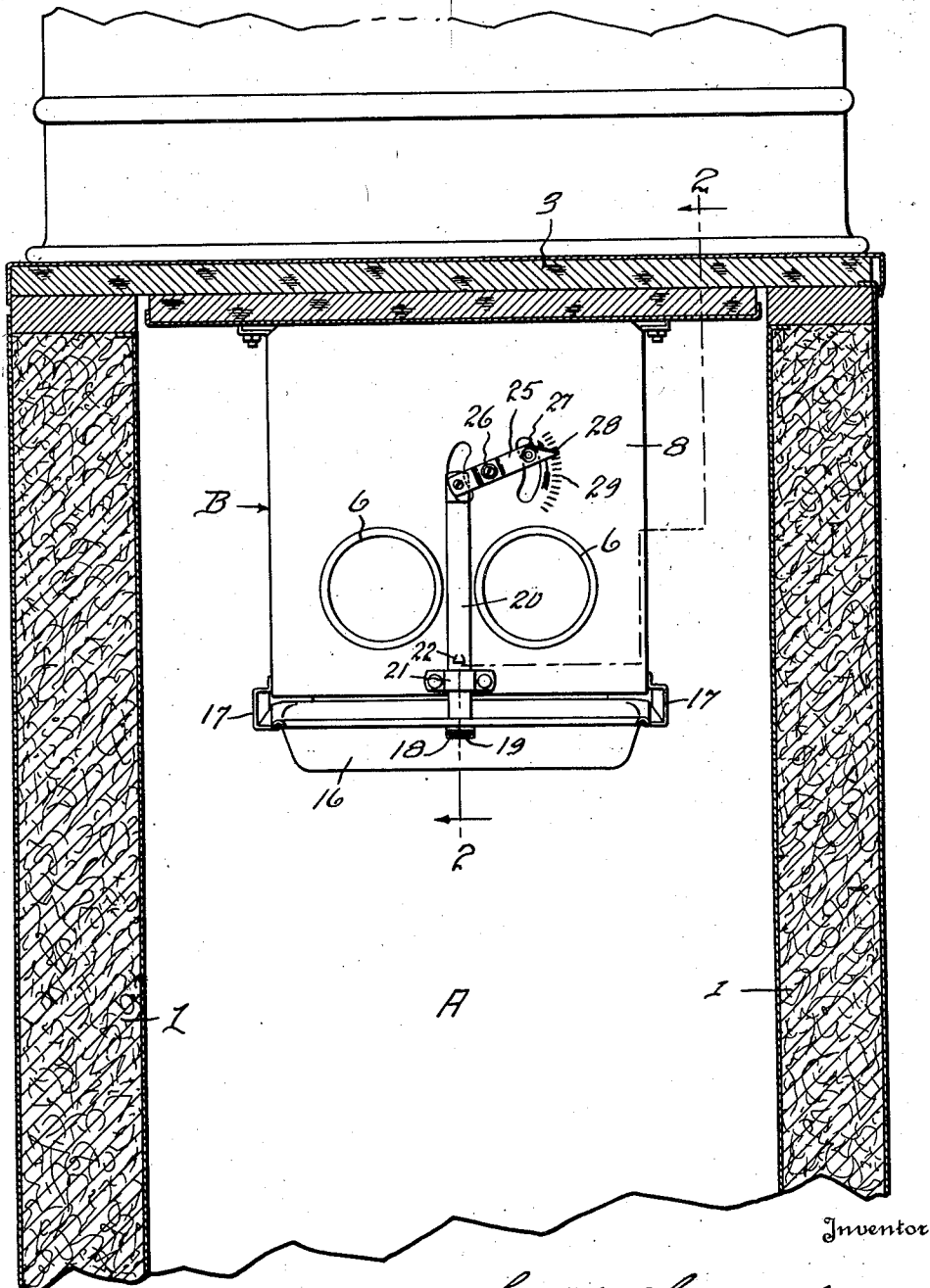


Fig. 1

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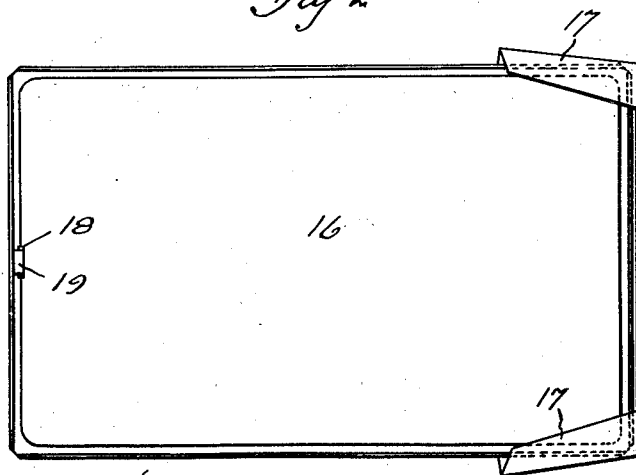
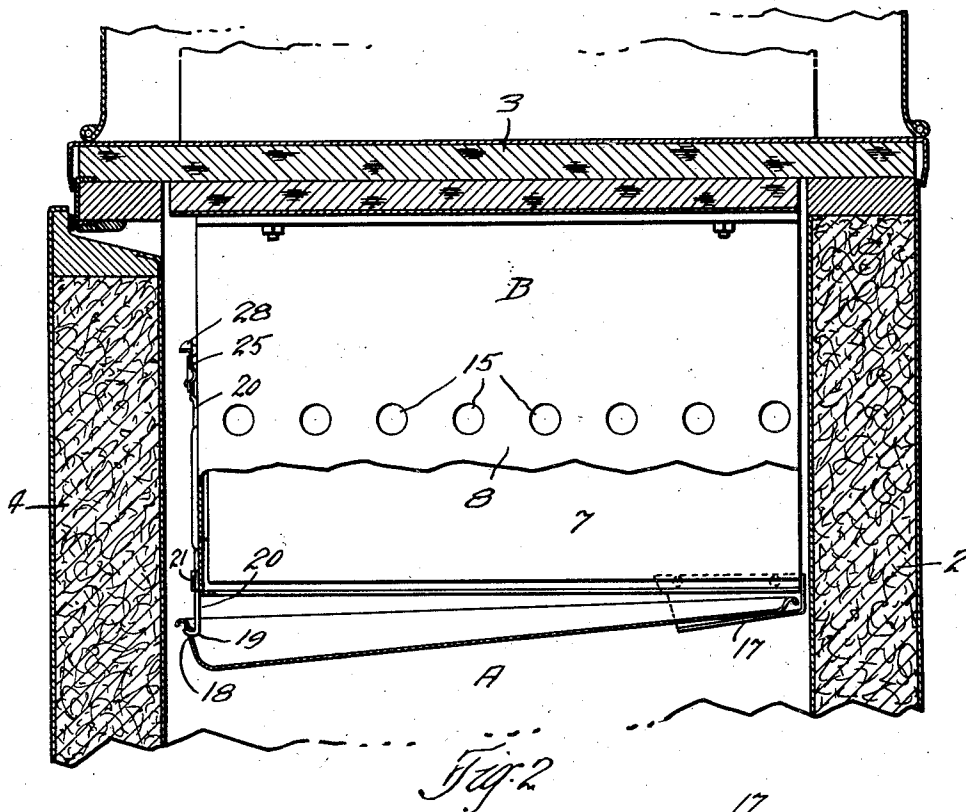
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TEMPERATURE CONTROL MEANS FOR REFRIGERATION COMPARTMENTS

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3 Sheets-Sheet 2



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TEMPERATURE CONTROL MEANS FOR REFRIGERATION COMPARTMENTS

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3 Sheets-Sheet 3

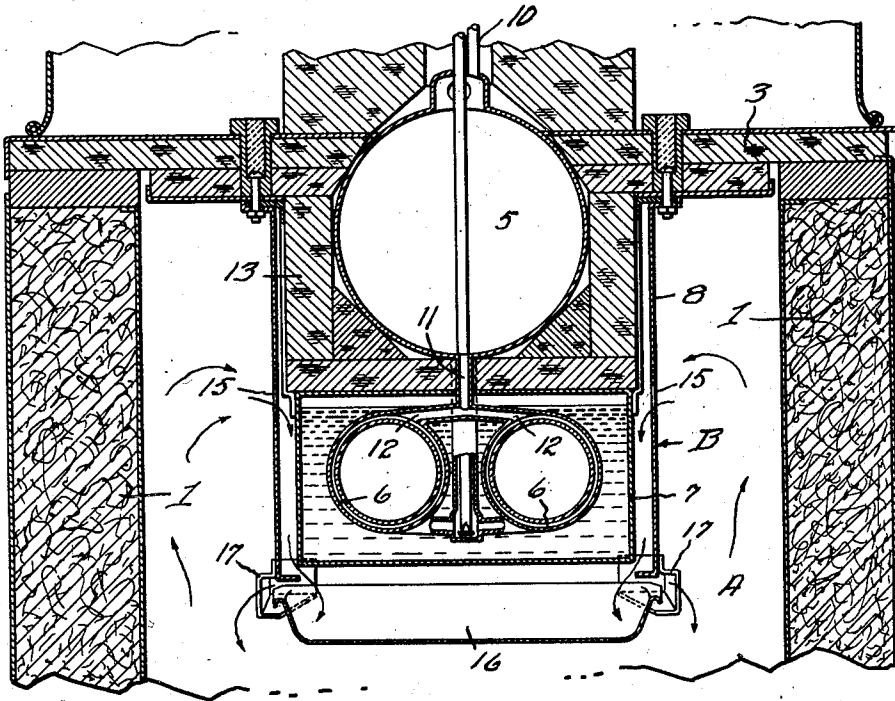


Fig. 4

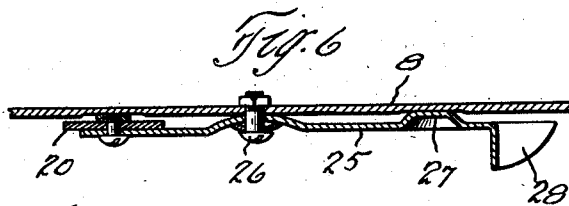
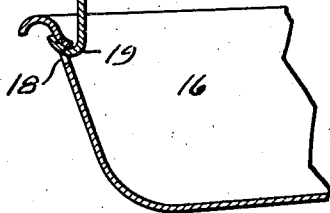
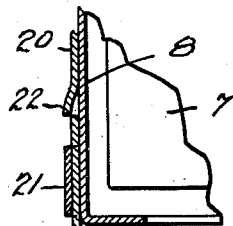


Fig. 5

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UNITED STATES PATENT OFFICE

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TEMPERATURE CONTROL MEANS FOR REFRIGERATION COMPARTMENTS

Application filed January 29, 1930. Serial No. 424,223.

This invention relates to refrigeration apparatus, and more particularly to means for controlling the temperature of the refrigeration compartment of such apparatus.

5 The broad object of the invention is to provide means for governing the quantity of the air circulated in the refrigeration compartment of an apparatus of the above mentioned class, due to the thermo-siphon action, thereby to control the degree of heat interchange between the cooling unit and the main portion of said compartment.

Other objects are to provide means of the above character that is relatively simple; that is highly efficient; that is comparatively inexpensive and therefore adds little to the cost of the apparatus, and that operates somewhat in the manner of a damper and, preferably, utilizes the drip tray, whose primary purpose is to catch water that drips from the cooling unit during defrosting periods, as the damper element.

Other objects are to provide an adjustment for the controlling means that is convenient of manipulation; and to provide in conjunction therewith an indicator for facilitating the setting of the adjustment to obtain given temperature values.

30 The present preferred embodiment of the invention is illustrated in the accompanying drawings and although I shall proceed to describe the same in detail it will be understood that I do not limit myself to this particular construction further than is required by the terms of the appended claims.

Referring to the drawings, wherein like characters designate corresponding parts throughout the several views, Fig. 1 is a fragmentary sectional front elevation of a refrigeration apparatus embodying the invention; Fig. 2 is a vertical section through the apparatus in the region of the cooling unit, the section being from front to rear and in offset planes as indicated by the line 2-2 of Fig. 1; Fig. 3 is a bottom plan view with the insulated walls of the cabinet omitted; Fig. 4 is a vertical section through the cooling unit and the adjacent portion of the cabinet, the plane of section being parallel to that of Fig. 1; Fig. 5 is an enlarged sectional

detail showing the detachable connection between the drip tray and the adjusting mechanism therefor; and Fig. 6 is a sectional detail on the same scale as Fig. 5 of the adjusting lever of said mechanism.

55 The refrigeration apparatus in connection with which the invention is herein disclosed is of the same class as that which constitutes the subject matter of an application filed December 27, 1927, by David F. Keith, Serial No. 242,574.

The refrigeration compartment, designated A, is enclosed within a cabinet constructed of insulated side walls 1, rear wall 2, and top wall 3. The front of the cabinet is closed by an insulated door 4. Supported by the top wall 3, within the upper portion of the refrigeration compartment A, is a cooling unit designated generally by the reference character B. This cooling unit consists of a receiver 5 for the condensed refrigerant vapors, evaporators 6 that are in the nature of double wall vessels, a brine tank 7 wherein the evaporators are disposed, and a rectangular casing 8 that encloses the foregoing parts of the cooling unit. The refrigerant condensate is delivered to the receiver 5 through a pipe or conduit 10, and flows therefrom to the refrigerant spaces between the inner and outer walls of the evaporators 6 through tubes 11 and 12. The chambers enclosed by the inner walls of the evaporators open through the front wall of the brine tank 7 and register with openings in the front wall of the casing 8 and constitute what are commonly referred to as freezing tubes. The receiver 5 is preferably enveloped by insulating material 13.

The side walls of the casing 8 are spaced from the corresponding walls of the brine tank 7 and adjacent the top of said tank are provided with openings 15. It will be observed from Figs. 2 and 4 that the bottom of the casing is open, and removably and adjustably supported therebelow is a drip tray 16. Such manner of supporting the tray is accomplished by means which I shall now describe. The rear corners of the tray bear within socket members 17 that depend from the adjacent corners of the casing, while the

front wall of the tray is provided with an opening 18 that is designed to receive the hooked lower end 19 of a slide 20 that is reciprocably supported by the front wall of the casing 8, the lower end of said slide being guided through a stirrup 21 that is secured to said wall adjacent its lower edge. A projection 22 on the slide 20 limits the downward movement of the slide, and consequently the extent to which the forward end of the drip tray 16 may be lowered, by engagement with the stirrup 21.

One end of an adjusting lever 25 is pivotally connected to the upper end of the slide 20, and intermediate its ends said lever is fulcrumed on a bolt 26 that extends through the front wall of the casing 8, as best shown in Fig. 6. A depression 27 of the lever 25 bears against the front wall of the casing 8 with sufficient friction to maintain the parts in any position to which they are adjusted, and to facilitate the setting of the adjusting mechanism the free end of the adjusting lever is formed with a finger grip 28 and is associated with a scale 29 on the front of the casing. The arrow associated with the scale, together with the legend "cooler", indicates the direction in which the mechanism should be adjusted in order to obtain a lower temperature of the refrigeration compartment.

It will be understood that in the normal operation of the apparatus the air adjacent the brine tank 7 is chilled and descends through the open bottom of the casing 8 into the refrigeration compartment A and displaces the warmer air upwardly along the side walls 1 of the cabinet where it enters the casing 8 through the openings 15 in the side walls thereof to take the place of the air that was previously chilled and descended from said space, the incoming warmer air, in turn, being chilled and passing downwardly. Thus a thermo-siphon circulation of air within the refrigeration compartment is induced by the cooling unit, and the amount of air circulated may be controlled by the adjustment of the drip tray 16 toward and from the open bottom of the casing 8 by means of the adjusting mechanism consisting of the slide 20 and the lever 25. By moving the free end of the lever upwardly, as indicated by the arrow on the front of the casing 8, the forward end of the tray 16 is lowered, thus affording a freer circulation of air and a more effective cooling of the refrigeration compartment A. To raise the temperature of the refrigeration compartment, the free end of the adjusting lever is moved downwardly so as to elevate the forward end of the drip tray and thus retard the flow of air downwardly through the open bottom of the casing 8.

Convenient removability of the drip tray is desirable for the reason that during the defrosting periods the water dripping from the cooling unit is collected in the drip tray and

to empty the tray it is only necessary to disengage its forward end from the hooked lower end of the slide 20 and withdraw the rear end of the tray from the socket members 17.

Having thus described my invention, what I claim is:

1. Refrigeration apparatus comprising an enclosure for the refrigeration compartment, a cooling unit within said compartment, an open bottom casing about the cooling unit having an opening spaced above its bottom, and a drip tray removably supported below and adjustable toward and from the open bottom of said casing.

2. Refrigeration apparatus comprising an enclosure for the refrigeration compartment, said enclosure having a door opening, a door therefor, a cooling unit within said compartment, an open bottom casing about the cooling unit having an opening spaced above its bottom and arranged with its front adjacent said door opening, means for varying the quantity of air circulated through said casing, and manually operated adjusting mechanism therefor sustained by the front of said casing.

3. Refrigeration apparatus comprising an enclosure for the refrigeration compartment, said enclosure having a door opening, a door therefor, a cooling unit within said compartment, an open bottom casing about the cooling unit having an opening spaced above its bottom and arranged with its front adjacent said door opening, a member supported below and movable toward and from the open bottom of the casing, manually operated adjusting mechanism therefor sustained by the front of the casing, and indicating means on the front of the casing associated with said mechanism.

4. Refrigeration apparatus comprising an enclosure for the refrigeration compartment, a cooling unit located within the upper portion of said compartment, an open bottom casing about the cooling unit having one or more openings spaced above its lower end, and a drip tray sustained below the open bottom of the casing and adjustable toward and from the same.

5. Refrigeration apparatus comprising an enclosure for the refrigeration compartment, a cooling unit located within the upper portion of said compartment, an open bottom casing about the cooling unit having one or more openings spaced above its lower end, a drip tray sustained below the open bottom of the casing and adjustable toward and from the same, and indicating means for indicating the degree of adjustment.

6. Refrigeration apparatus comprising an enclosure for the refrigeration compartment, a cooling unit located within said compartment, an open bottom casing about the cooling unit having one or more openings spaced above its lower end, a drip tray sustained below the open bottom of the casing, and

means through which said tray is adapted to be adjusted toward and from the open bottom of the casing.

tachably connected, and a lever fulcrumed to the casing and having one of its ends pivotally connected to the slide.

In testimony whereof, I hereunto affix my signature.

LEE S. CHADWICK.

7. Refrigeration apparatus comprising an enclosure for the refrigeration compartment, a cooling unit located within said compartment, an open bottom casing about the cooling unit having one or more openings spaced above its lower end, a drip tray sustained below the open bottom of the casing, and indicating means through which said tray is adapted to be adjusted toward and from the open bottom of the casing.

8. Refrigeration apparatus comprising an enclosure for the refrigeration compartment, a cooling unit located within said compartment, an open bottom casing about the cooling unit having one or more openings spaced above its lower end, supporting means adjacent one side of the lower end of the casing, a drip tray adapted to have one side engaged within said supporting means, and adjusting mechanism at the opposite side of the casing and connected to said drip tray for sustaining its adjacent side at various distances from the casing.

9. Refrigeration apparatus comprising an enclosure for the refrigeration compartment, a cooling unit located within said compartment, an open bottom casing about the cooling unit having one or more openings spaced above its lower end, supporting means adjacent the lower end of the casing toward the back of the refrigeration compartment, a drip tray whose rear end is adapted to be sustained by said supporting means, adjusting mechanism on the front of the casing and connected to said drip tray for sustaining its forward end at various distances from the lower front portion of the casing, and indicating means associated with said adjusting mechanism.

10. Refrigeration apparatus comprising an enclosure for the refrigeration compartment, a cooling unit located within said compartment, an open bottom casing about the cooling unit having one or more openings spaced above its lower end, supporting means adjacent one side of the lower end of the casing, a drip tray having one side removably engaged within said supporting means, and adjusting mechanism located on the opposite side of the casing and to which the corresponding side of the drip tray is detachably connected.

11. In refrigeration apparatus, in combination with the cooling unit, an open bottom casing enclosing the same and having means for admitting air above its open bottom, a drip tray below the casing, means adjacent one side of the casing removably supporting the corresponding edge of the tray, a slide reciprocally carried by the opposite side of the casing and to the lower end of which the adjacent side of the tray is adapted to be de-

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