

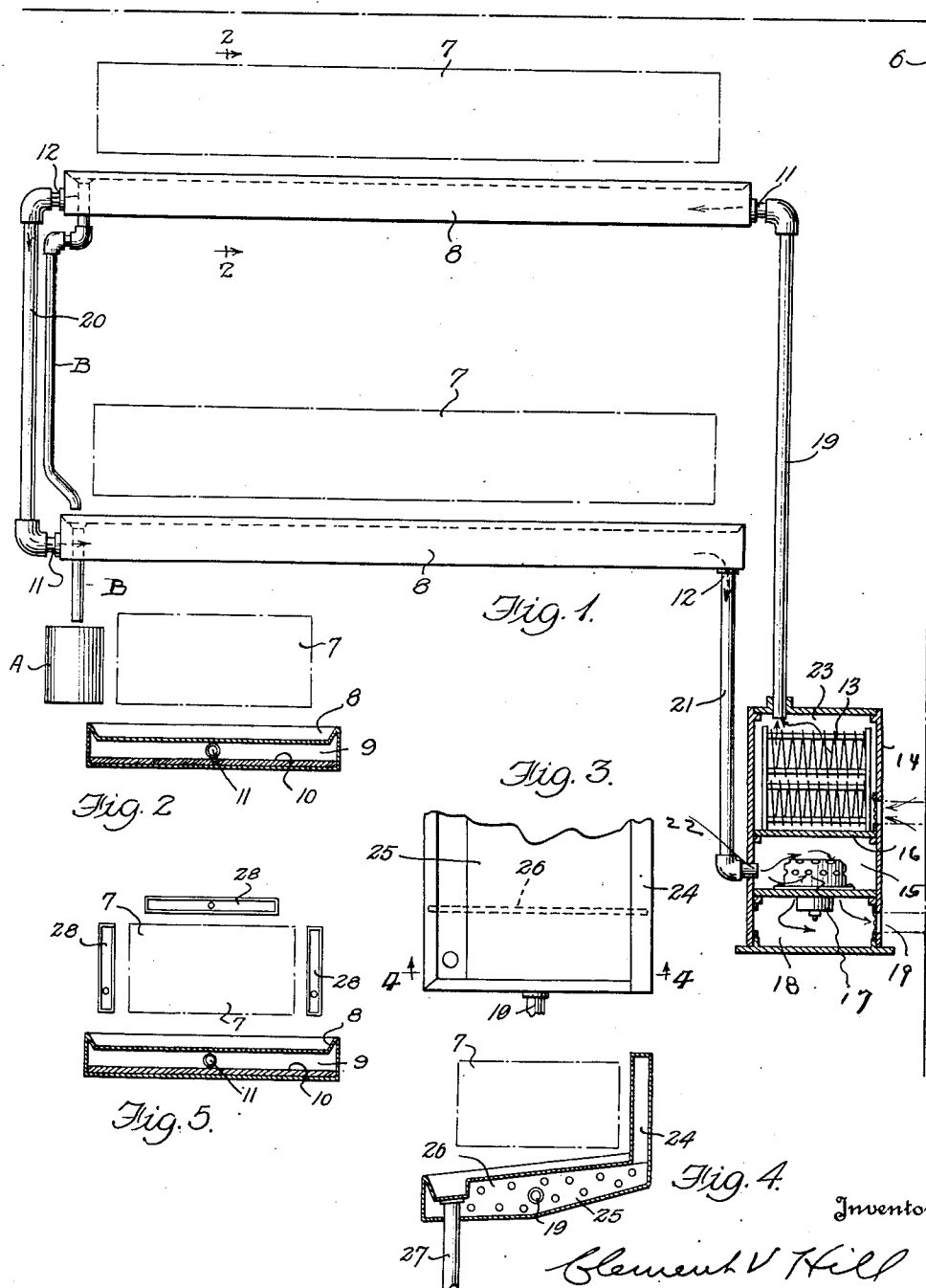
Dec. 6, 1932.

C. V. HILL

1,890,085

DEFROSTING DEVICE FOR REFRIGERATING CASES

Filed June 9, 1930



Inventor

Clement V Hill
By Lewis S. Clarkson
Attorney

UNITED STATES PATENT OFFICE

CLEMENT V. HILL, OF TRENTON, NEW JERSEY, ASSIGNOR TO C. V. HILL & CO., INC., OF TRENTON, NEW JERSEY, A CORPORATION OF NEW JERSEY

DEFROSTING DEVICE FOR REFRIGERATING CASES

Application filed June 9, 1930. Serial No. 459,960.

My invention is primarily designed for use in connection with display refrigerating cases used in stores in which perishable goods are exhibited, but it is not necessarily limited to such cases, but is applicable to refrigerating cases in general.

The object of my invention is to defrost the refrigerating coils without removing goods from the cases by simply shutting down the refrigerating machine and supplying a hot medium to the coils and drip pans whereby the melted frost and ice on the coils and in the pans is reduced to water, which water drains to the usual reservoir or trap with which such cases are usually provided.

I have found that unless the pans are warmed in some manner when the coils are defrosted, the water would simply freeze up in the pans as they, of course, are always below a freezing temperature, unless the doors of the case are thrown open which would result in the whole case becoming unduly warm.

It has been the practice in defrosting to open up the case, but this is objectionable because the temperature within the case is materially raised and it takes quite a while to lower this temperature after the case is closed. It has always been the practice in some instances to entirely remove the goods from the case when the case is being defrosted, but this is also objectionable in that it entails considerable work and time in removing the goods from the case and placing them in other suitable cold storage pending the defrosting period.

In some refrigerator show cases the temperature ranges from zero up to 15 to 20 degrees.

In the drawing:

Figure 1 is a more or less diagrammatic view of a refrigerating case, the coils and drip pan, with my invention embodied.

Figure 2 is a transverse sectional view through a drip pan, the coil being shown in dotted lines.

Figure 3 is a top plan view of a drip pan showing a slight modification.

Figure 4 is a vertical transverse section of

Figure 3 on the line 4—4, looking in the direction of the arrow.

Figure 5 is a transverse sectional view of a drip pan associated with a coil and warming elements.

The reference numeral 6 designates a suitable refrigerating case shown in outline in dotted lines. This case may be of any desired type and may contain one or more coils as desired.

7 is a refrigerating coil of any approved type which is operatively connected to the refrigerating mechanism usually found in connection with refrigerating cases. 8 is a drip pan which has a hollow bottom 9 preferably provided with an insulating surface 10. This hollow bottom is provided with an inlet 11 and an outlet 12.

I provide at some convenient place, either within or outside of the case, as may be preferred, a heating element 13 which I have elected to show merely for the purpose of illustrating my invention as an electric heating element which is enclosed in a case 14 having a lower chamber 15 which is separated from the heating element by a partition 16. In the compartment 15 I provide a suction fan, or other suction mechanism 17, which discharges into the compartment 18 and thence through the outlet 19 to outside atmosphere.

This heating element is in communication with the hollow bottom 9 of the drip pans by means of a pipe 19 extending from the compartment in which the heating element is located to and connected with the inlet port 11 of the pan 8. The inlet port 11 of the lowermost pan 8 is connected to the exit port 12 of the uppermost pan 8 by means of a pipe 20, and the exit port 12 of the lowermost pan 8 is connected with the exhaust chamber 15 by means of the pipe 21 so that when the refrigerating mechanism is shut down the heating element is put into operation and simultaneously the suction fan is put into operation whereby the suction fan draws air from the hollow bottom 9 of the lowermost pan 8 thereby drawing air into the port 22 of the heating chamber 23, passing the air over the heating element and sucking it up

through pipe 19, through the hollow bottom of the uppermost pan 8, through the pipe 20, through the hollow bottom of the lowermost pan 8, and thence through the pipe 21, through the fan, and then it is exhausted through port 19 to atmosphere.

The passing of the heating medium through the hollow bottom 9 of the drip pan 8 raises the temperature of the pan, melts the ice and frost in the pan, and defrosts the coils, the water from the coils and pan being conducted from the pan to the usual trap, or reservoir provided in such cases.

The pans will be made to fit stock coils, already in use.

Unless the pans are warmed in some manner when the coils are defrosted, the water would simply freeze up in the pans as they, of course, are always below freezing temperature, unless the doors of the case are thrown open, which is objectionable because then the whole case becomes warm.

If desired I can provide a hollow extension 24 for the pans 25 as shown in Figure 4, and I may also, if desired, provide baffle plates 26 which are perforated and at certain distances from the ends of the pan, as clearly shown in Figures 3 and 4. In Figure 4 I shall show the drip pipe 27 for the pans.

In some instances it may be found desirable to arrange warming elements 28 at each side and the top of the coil, as shown in Figure 5. However, I have found that the warming of the drip pans has proven to be all that is necessary in properly and effectively defrosting the coils and pans.

It is, of course, obvious that instead of warm air any other suitable heated fluid may be passed through the hollow bottoms of the drip pans. However, experience has shown that hot air pumped through the hollow bottoms of the drip pans has been found efficient in properly and quickly defrosting the coils and pans, because when this hot air is forced through the pan the heat will radiate and melt the ice in the pans and defrost the coils, and the water resulting from such defrosting and melting being at a higher temperature than freezing will readily run off to the usual trap, or reservoir.

As shown in Figure 1, pipes B lead from the pans 8 and conduct the water to the reservoir A, which may be of any desired size and arranged close to the bottom of the pan. Preferably, these pipes B are covered with an insulation (not shown).

What I claim is:

1. The method of defrosting the cooling coils in a refrigerator having drip pans beneath the coils, which consists in shutting down the refrigerating apparatus, passing comparatively warm medium through the drip pans, and expelling the water of condensation together with the warm medium from said pans.

2. In a refrigerator, in combination, a refrigerating coil, a drip pan under said coil, a heating element, a conductor connecting the heating element with said pan to conduct a warming medium from said element to said pan, an exhaust mechanism for said medium, and a conductor connecting said pan with said exhaust mechanism whereby said medium is passed through said pan and discharged therefrom.

3. In combination in a refrigerator, a refrigerating coil, a drip pan for said coil having a heating compartment, and means for supplying a heating medium to the heating compartment of said pan.

4. In combination in a refrigerator, a refrigerating coil, and a hollow drip pan for said coil, and exit and inlet ports opening into the hollow part of said pan, and means to supply a comparatively hot medium into the hollow part of the pan.

5. In combination, in a refrigerator, a refrigerating coil, a drip pan for said coil, and means for producing and circulating a heating fluid in contact with said pan to defrost the same and the coil.

6. In combination, in a refrigerator, a refrigerating coil, a drip pan for said coil, means to heat a fluid at a point remote from the coil, and means for conducting said fluid to the pan to defrost the same and the coil.

7. In combination, in a refrigerator, a refrigerating coil, a drip pan for said coil, a heating compartment, means connecting said pan with said heating compartment, and an exhaust mechanism also connected with said pan.

8. In combination, in a refrigerator, a refrigerating coil, a drip pan having a hollow bottom, a heating compartment, means connecting the heating compartment with the hollow bottom of the pan, and an exhaust mechanism and means connecting the exhaust mechanism with the hollow bottom of said pan.

9. In a refrigerator having a cooling coil, a drip pan disposed beneath the coil, means providing a heating chamber beneath the pan and having an upright extension lying alongside the coil, and means for supplying a heating fluid to and exhausting it from said chamber.

10. In a refrigerator having a cooling coil, a drip pan disposed beneath the coil, means providing a heating chamber beneath the pan, a casing having air supply and exhaust compartments communicating with the chamber, a heater in the air supply compartment, and a suction and discharge fan in the exhaust compartment.

11. In a cooling coil defrosting device for a refrigerator having a cooling coil and a drip pan beneath the coil, means for conducting a comparatively warm medium to

the pan and exposing the coil to the defrosting action thereof, and means for expelling the resulting water of condensation and the warm medium from the pan.

5 12. In a refrigerator having a refrigerating circuit including a cooling coil, and a drip pan disposed beneath the coil, a heating circuit independent of the refrigerating circuit and including the pan, and means inde-
10 pendent of the refrigerating circuit for supplying a heated fluid to said heating circuit.

13. In a refrigerator having a refrigerating system including a cooling coil, a drip
pan disposed beneath the coil, means provid-
15 ing a heating compartment beneath the pan, a heating system independent of the refrigerating system and including said chamber. and means for supplying a heating fluid to said heating system.

20 In testimony whereof I affix my signature.
CLEMENT V. HILL.

25

30

35

40

45

50

55

60

65