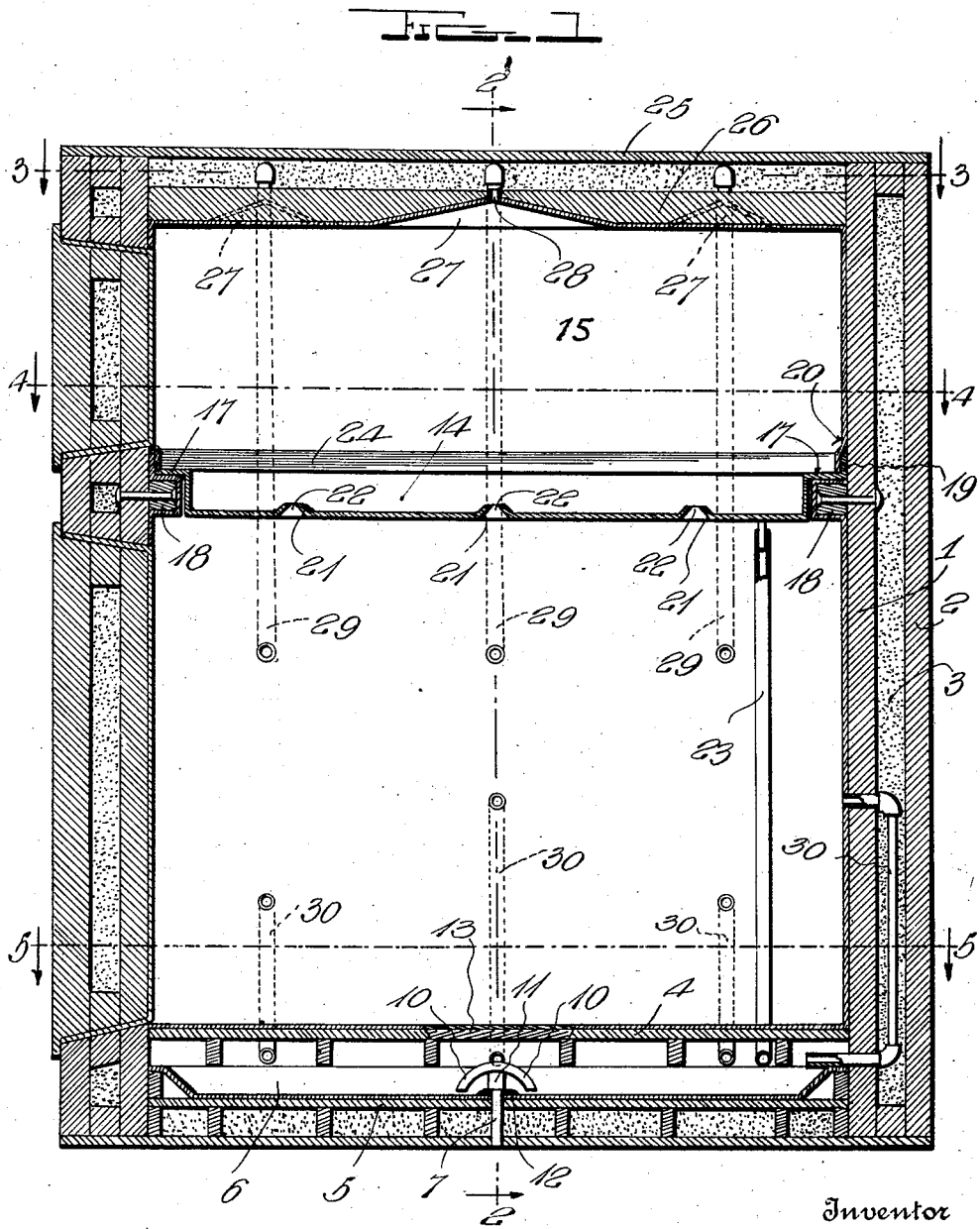
Feb. 22, 1927. 1,618,469

H. PARRIS

REFRIGERATOR

Filed Jan. 25, 1923 4 Sheets-Sheet 1



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Harry Parris

Witness

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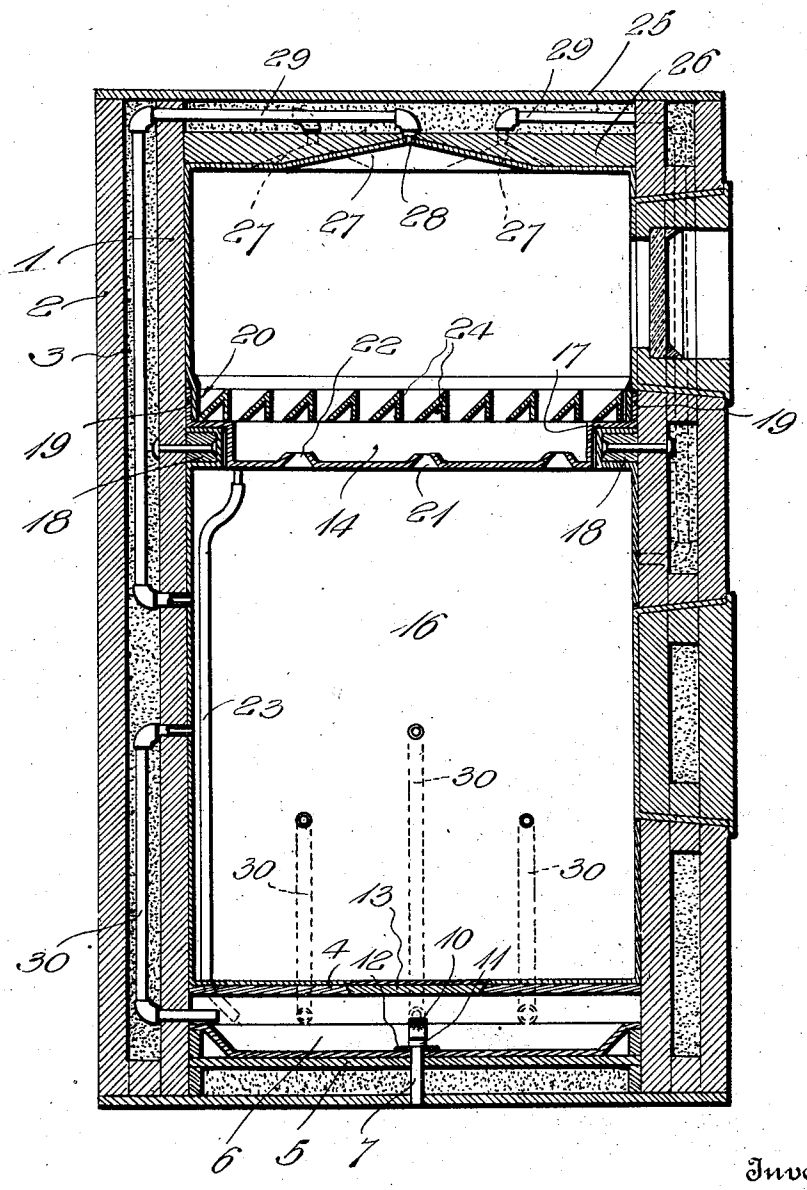
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Fig. 2



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FIG. 3

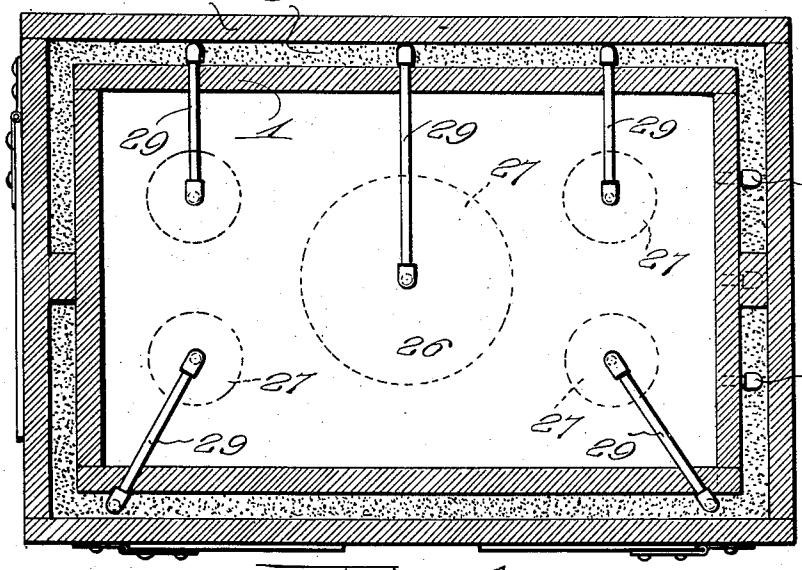
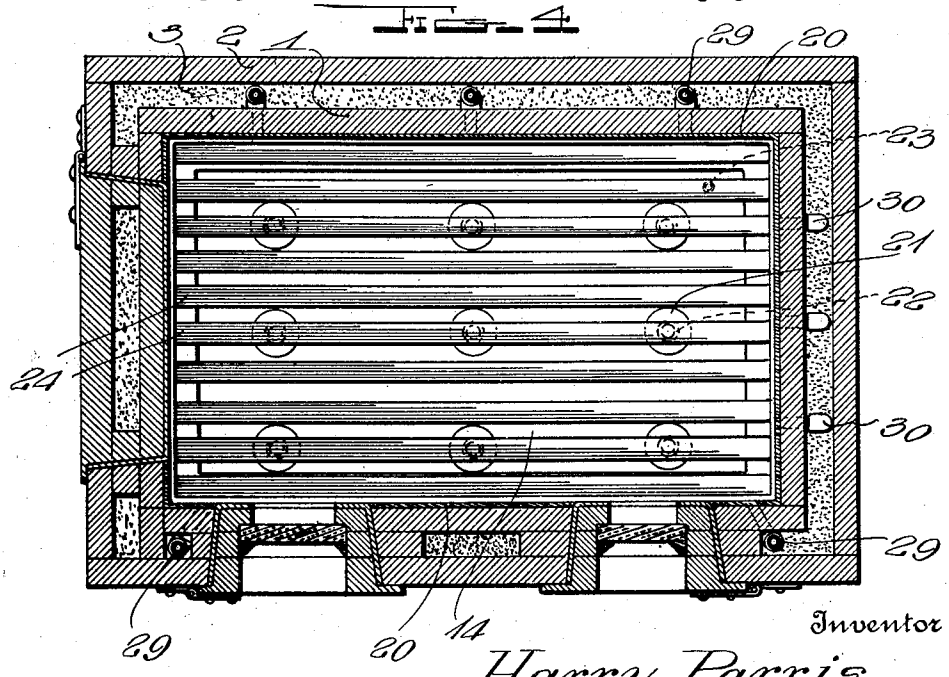


FIG. 4



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FIG. 5

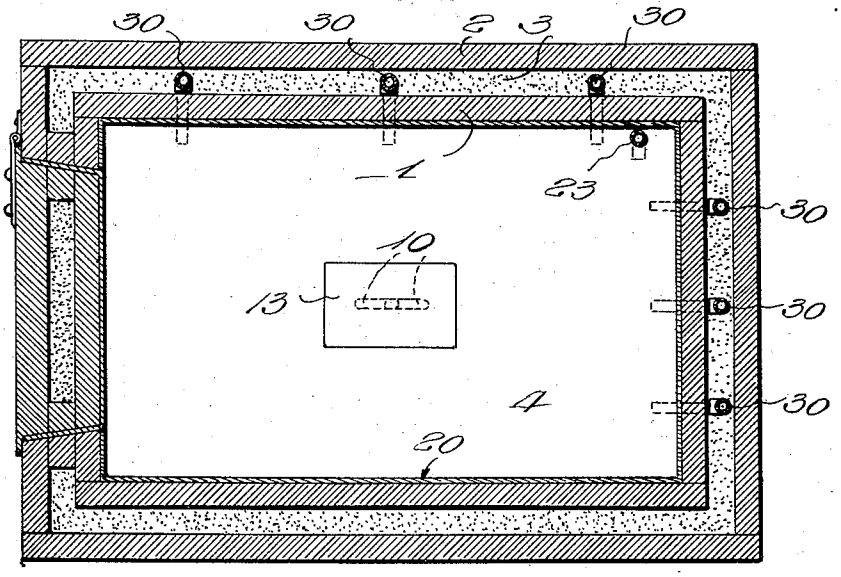


FIG. 6

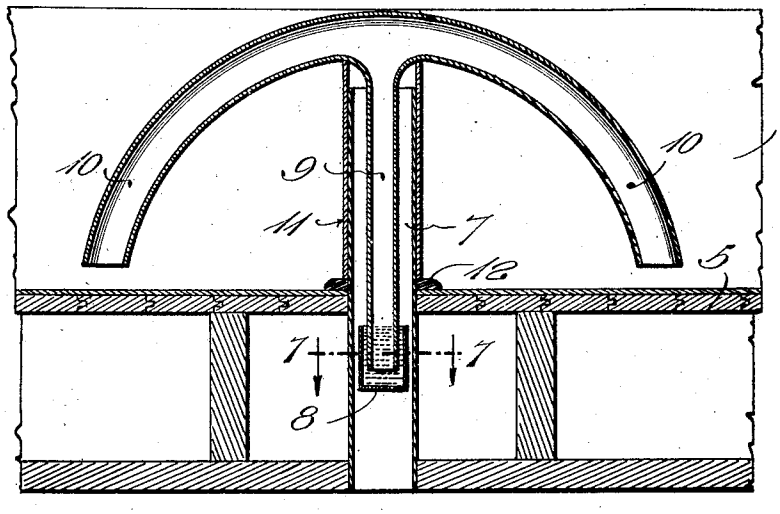
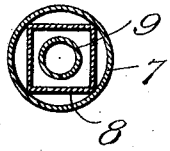


FIG. 7



Witness

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Patented Feb. 22, 1927. 1,618,469

UNITED STATES PATENT OFFICE.

HARRY PARRIS, OF ST. LOUIS, MISSOURI.

REFRIGERATOR.

Application filed January 25, 1923. Serial No. 614,878.

My invention relates to improvements in refrigerators and while the present disclosure is directed more particularly to one of the type used in stores and the like for containing meat and other perishable produce, it will be understood that the invention is not restricted to this particular field.

One object of the invention is to provide a refrigerator having novel means for circulating cold air therein, whereby to produce more effective refrigeration.

A further object is to provide a refrigerator having a pan at its lower end for retaining a quantity of ice water supplied thereto from a drip pan for the ice compartment, thereby further assisting in producing an extremely low temperature within the refrigerator.

With the foregoing in view, the invention resides in the novel subject matter hereinafter described and claimed, the description being supplemented by the accompanying drawings.

Figure 1 is a vertical longitudinal sectional view through a refrigerator constructed in accordance with my invention.

Figure 2 is a vertical transverse sectional view as indicated by line 2—2 of Fig. 1.

Figures 3 and 4 are horizontal sectional views on lines 3—3 and 4—4 of Fig. 1.

Figure 5 is a horizontal sectional view cut on a lower plane, as indicated by line 5—5 of Fig. 1.

Figure 6 is an enlarged vertical sectional view through the water sealed overflow from the water retaining pan.

Figure 7 is a horizontal sectional view as indicated by line 7—7 of Fig. 6.

The wall of the refrigerator casing is preferably formed of inner and outer walls 1 and 2 spaced apart to provide a dead air insulating space 3 and while these walls 1 and 2 have been shown of solid construction, it will be understood that they may be of any suitable construction desired. The space between the two walls is filled with cork or any suitable material which forms a good insulation. The lower end of the refrigerator is provided with a suitable floor or bottom 4 and with a false bottom 5 spaced beneath the same, a water retaining pan 6 being disposed between the two bottoms and being substantially co-extensive therewith. This pan receives the drippings from the ice and I provide a unique form of water sealed overflow which permits the maintenance of a constant level of water in said pan. This overflow is detailed in Figs. 6 and 7 to which reference is now made more particularly.

A vertical water discharge pipe 7 which may be connected to any desired drain pipe or to a sewer, passes through the bottom of the pan 6 and has a liquid-tight connection therewith, said pipe being provided at its interior with a water cup 8 whose sides are spaced from the pipe, said cup being preferably of square form with its corners secured to the pipe as detailed in Fig. 7. An inner relatively small water discharge pipe 9 is received in and spaced from the pipe 7, the lower end of said pipe 9 being received in the water cup 8 while the upper end of said pipe 9 is provided with one or more downturned water inlet arms 10 which extend to a plane near the bottom of the pan 6. In the construction shown, a sleeve 11 frictionally surrounds the pipe 7 and rests at its lower end upon a rubber washer or the like 12, while the upper end of said sleeve has a liquid-tight connection with the upper end of the pipe 9.

By the construction shown, the water level will rise in the pan 6 and the arm or arms 10 until it can flow out through the pipe 9. Before any of this water discharges into the pipe 7 however, it fills the cup 8 and thus forms an air-tight liquid seal. As more water descends through the pipe 9, the cup 8 of course overflows into the discharge pipe 7. Whenever desired, the pipe 9 and the sleeve 11 may be bodily removed for cleaning, for which purpose I have shown a removable section 13 in the floor 4.

The interior of the refrigerator is divided by a horizontal drip pan 14 into an upper ice compartment 15 and a lower refrigerating compartment 16. The pan is preferably rather shallow and may well be provided at its upper edge with an outwardly extending horizontal flange 17 to rest on an appropriate supporting ledge 18. Also if desired, the flange 17 may be formed at its outer edge with an upstanding flange 19 over which the metal lining 20 for the refrigerator may lap, insuring that all drippings from the ice and condensate on the walls of the compartment 15, shall enter the pan. At suitable intervals, the bottom of this pan is stamped upwardly to provide a plurality of conical members 21 having air circulating openings 22 in their apices. The water dripping into the pan will not overflow

through the openings 22, as an outlet pipe 23 which leads from said pan into the pan 6, has its inlet end at a sufficiently low level to prevent such an occurrence. Furthermore, water is prevented from dripping directly into the openings 22 upon the ice, by the provision of a plurality of transversely arched ice supporting bars 24 which extend across the pan 14 and may have their ends supported upon and suitably secured to the flange 17. The bars 24 are preferably of inverted V-shape as shown.

The top of the refrigerator which is formed of suitable upper and lower walls 25 and 26 spaced apart, is provided in its lower side with a plurality of cavities which receive a plurality of inverted funnel-shaped sheet metal members 27 having openings 28 at their apices which connect with the upper ends of upright air circulating pipes 29 disposed between the inner and outer walls of the refrigerator, the lower ends of these pipes being in communication with the refrigerating compartment 16. Other air circulating pipes 30 between the inner and outer walls of the casing establish communication between vertically spaced portions of the compartment 16 and the space between the floor 4 and the water retaining pan 6.

The operation of the refrigerator is as follows:

The cold air from the ice compartment descends through the space between the supporting bars and the openings 22 into the food compartment 16. Cold air also descends through the drain pipe 23 into the drain pan compartment 6. This leg or column of cold air in the pipe 23 is absolutely unmolested and completely separated from the food compartment. This condition causes this leg of air to descend into the drip pan compartment 6 and to pile up therein, the accumulated ice water tending to keep the air cool. This particular portion of cold air after completely filling the compartment 6 then fills the pipes 30 and comes out into the food compartment 16 at a point a little above the bottom of the compartment, it then mingles with the cold air in the latter. As the warm air rises, it enters into pipes 29 through their open lower ends. These pipes 29 are in the insulation between the refrigerator walls and, since separated from the cold ice compartment walls, permit the warm air to readily rise to the top of the funnels 27. The ice in the ice compartment cools the air above the ice, partly by radiation, but largely by conduction, and the air in the funnels tends therefore to be cold. This cold air, contacting with the warm air in the tops of the funnels, for the warm air tends to rise, cools it, and it then gradually falls, but it falls as cold air, not warm, as it was on entering the funnels. The amount of the incoming warm air being small in comparison to the size of the ice compartment roof or top, it is desirable that it should not spread over the whole top, and therefore the funnels are used to keep it collected in a small space and to allow it to contact with restricted cold air, until it is cooled.

By providing the construction shown and described, or a substantial equivalent thereof, a refrigerator is provided which is highly efficient. As excellent results have been obtained from the general arrangement shown and described, this arrangement may well be followed, but within the scope of the invention as claimed, numerous changes may of course be made.

I claim:

1. A refrigerator comprising a casing having an ice compartment in its upper end, a refrigerating compartment beneath said ice compartment, a pan between said compartments, a compartment beneath said refrigerating compartment and separated therefrom by a floor, a conduit connecting the lower part of said ice compartment to the compartment beneath the refrigerating compartment, and substantially vertically disposed passages connecting said last named compartment to said refrigerating compartment.

2. A refrigerator comprising a casing having an ice compartment in its upper end, a refrigerating compartment beneath said ice compartment, a pan separating said compartments having air passages therein to permit the passage of air between said compartments, a compartment beneath said refrigerating compartment and separated therefrom by a floor, a conduit connecting the lower part of said ice compartment to the compartment beneath the refrigerating compartment, and substantially vertically disposed passages connecting said last named compartment to said refrigerating compartment, inverted funnels opening downwardly into the top of said ice compartment, passages outside of said ice and refrigerating compartments communicating with the upper part of said refrigerating compartment and the tops of said inverted funnels.

In testimony whereof I have hereunto affixed my signature.

HARRY PARRIS.