June 7, 1932. W. H. PERCIVAL 1,861,875

REFRIGERATOR COOLING STRUCTURE

Filed March 31, 1930 2 Sheets-Sheet 1

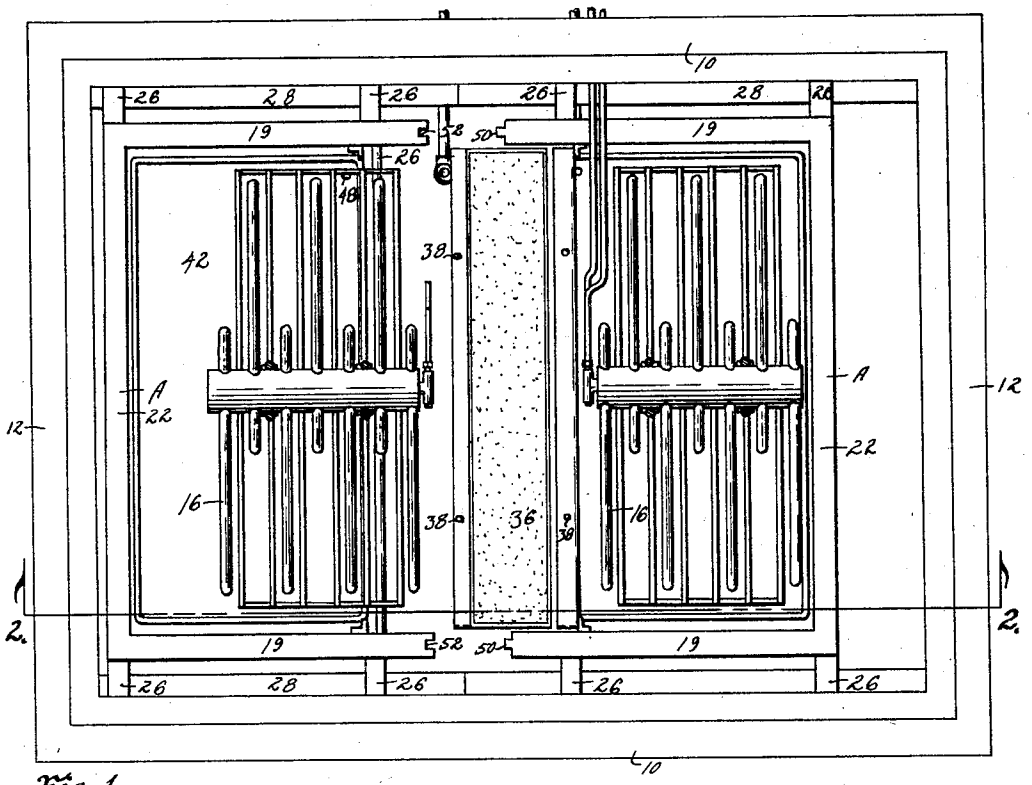


Fig. 1.

Fig. 2.

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Fig. 5.

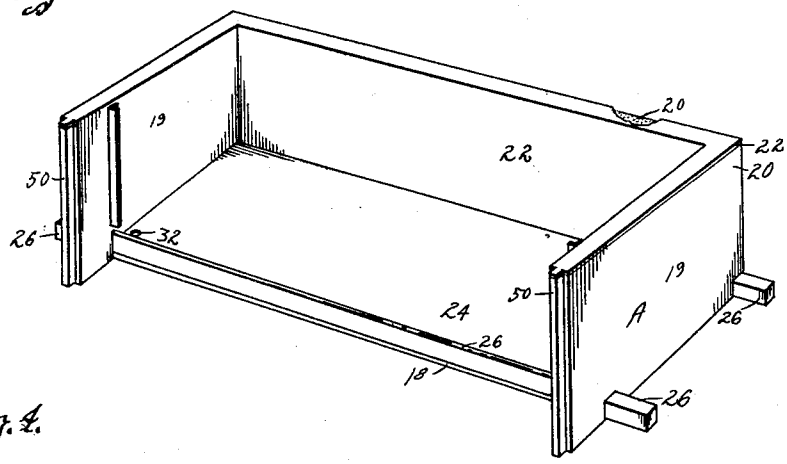


Fig. 4.

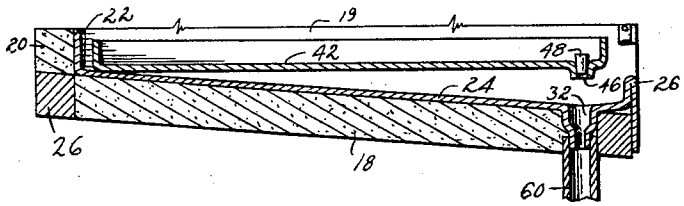
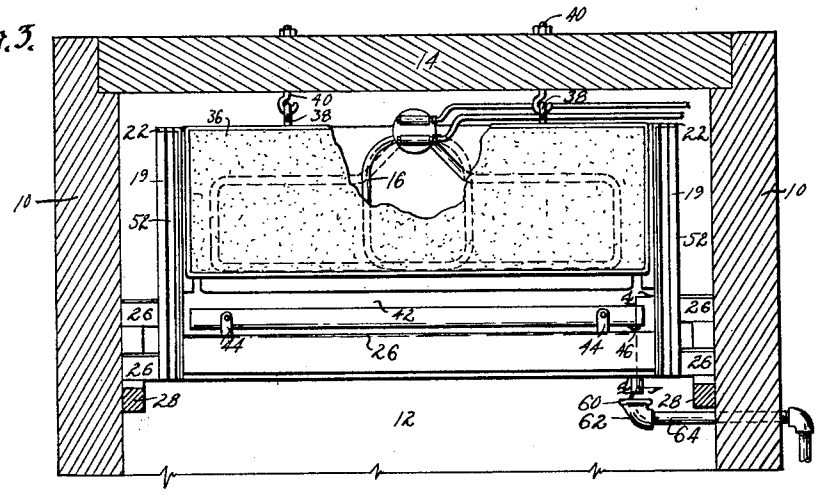


Fig. 3.



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UNITED STATES PATENT OFFICE

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REFRIGERATOR COOLING STRUCTURE

Application filed March 31, 1930. Serial No. 440,317.

My present invention has to do with a cooling unit structure used in refrigerators or coolers of the kind employed in butcher shops and the like, in which cooling coils are employed in the top of the refrigerator.

It is my purpose to provide in a refrigerator of this kind a cooling chamber made of parts, comprising a pair of members adapted to snugly receive the cooling coils.

Another purpose is to provide means for mounting such cooling chambers, so that they may be readily adjustable for affording access to the cooling coils.

More particularly, it is my purpose to provide a cooling chamber having a bottom and side walls and a separate movable front end wall.

Generally it is my purpose to provide such a structure with parts so arranged as to insure a maximum circulation of air and so arranged that the circulating air will be caused to flow closely adjacent to the cooling coils.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my refrigerator cooling structure, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 shows a top or plan view of a refrigerator having its top removed, the refrigerator being equipped with a cooling structure embodying my invention.

Figure 2 is a vertical, sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a vertical, sectional view taken on the line 3—3 of Figure 2.

Figure 4 is a vertical, sectional view through the bottom of one of the cooling chambers; and

Figure 5 is a perspective view of one of the cooling chamber members.

In the accompanying drawings, I have used the reference numeral 10 to indicate the side walls of a refrigerator of the kind herein contemplated.

The refrigerator has the end walls 12. The refrigerator is built with a top 14.

This refrigerator is of the type which is large enough to have a door in the lower portion through which a man may enter for hanging up meat or the like.

The cooling unit structure is arranged in the upper part of the refrigerator just under the top 14. In the particular form of my invention herein illustrated, two cooling coils 16 of standard commercial construction are hung from the top 14, spaced from each other lengthwise of the refrigerator.

I provide a cooling chamber member for each of these coils, and these two cooling chambers cooperate in such manner as to form one complete cooling chamber for the coils.

Each cooling chamber member comprises what might be called a box-like device A, having no front wall. The cooling chamber member A has a bottom 18, end walls 19 and a side wall 20. These walls may be made of suitable insulating material and are preferably lined with zinc 22, which extends across the bottom as at 24. The bottom 18 is inclined from the side wall 20 downwardly and toward the open end of the member A.

At the lower edge of the bottom 12, the lining portion 24 is provided with an upstanding rib, flange-like structure 26. The lining 24 thus forms what might be called an inclined pan in the bottom of the member A. Each member A is provided with lugs 26 projecting from its ends at its lower part, as shown for instance in Figure 5.

These lugs 26 are slidably supported on inclined tracks 28, which are inclined from the end walls 12 of the refrigerator inwardly and downwardly as shown in Figure 2 for example, and have at their lower parts the shoulders 30 to limit the sliding movement of the lugs 26.

The bottom 18 of each cooling chamber A has at its lower part near one end a discharge outlet 32. I provide for coacting with each of the cooling chamber units A, a separate member that might be called a partition 36 hung by means of eyes 38 on hooks 40 from the top 14, adjacent to one of the coils 16, and positioned to substantially close the opening side of its member A, when that member is in its inwardly adjusted position, as shown at the right-hand part of Figure 2.

The partition 36 terminates substantially above the bottom of its cooling chamber member A, as shown for instance at the right-hand part of Figure 2, so as to allow free circulation of air under it.

In each of the members A, I provide a metal pan 42, the outer part of which rests upon the bottom 18 and the inner part of which has the short pivoted legs 44 by which the pan 42 is supported in horizontal position.

The pan 44 has an outlet 46 above the lower part of the bottom 18, which may when desired be closed by a cork 48 or other closure member.

I will now refer to the practical use and operation of my cooling structure.

When the refrigerator is in use, the members A are moved to their inward limit of movement. The right-hand member A is shown in Figure 2 in its position then assumed. The ends 19 of the respective members A may be respectively tongued and grooved as indicated at 50 and 52, so that when the members A are slid together, a reasonably tight joint is provided, and the members A then form a box closed on all sides and open at its top and having at its bottom a central opening, which is provided by reason of the fact that the bottoms 18 terminate short of the ends of the members 19, as shown in Figures 2 and 5.

When the refrigerator is then in operation, it will be noted that there is a space entirely around the units A and between these units and the walls of the refrigerator through which air may pass upwardly from the lower part of the refrigerator and thence over the walls of the members A and downwardly into the members A. It has been noted that the members A taken together form a box closed on all four sides, so that all of the circulating air must pass upwardly around this box.

The members A are so constructed that the coils 16 fit rather closely therein.

The air passing upwardly around the sides 20 of the members A will tend to drop downwardly and then the shape of the coils 16 is such that the air must then pass to the bottom of the members A.

I preferably maintain a supply of brine in the pans 42.

This air therefore will pass along the supply of brine to the opening at the center of the complete box, that has been described, and thence downwardly into the refrigerator.

Air can also pass upwardly around the ends 19 of the members A, and as soon as it is passed over these ends, will naturally tend to drop downwardly on account of the cold coils 16. Any air that enters at all between the successive units of the coils must be carried downwardly to the lower parts thereof and will then travel along the brine holding pans 42.

On account of the construction thus explained, there will be a strong circulation and the tendency will be to draw the air which might pass up along the end walls 19 just outside the space between the partitions 36 to be drawn over into the respective members A and along the cooling coils rather than over the ends 19 and into the space between the members 36.

Because of the fact that the members of the coils 16 are substantially flat and upright and the further fact that the coils are received in the chambers A, fitting quite snugly adjacent the walls thereof, as illustrated at the right-hand side of Figure 1, it is obvious that practically all of the air which enters the chamber A must travel downwardly along the coils to the bottom of the chamber A and thence along the brine containing pan 42 to the opening at the lower end of the partition 36.

I have thus provided for insuring the movement of practically all of the air in close proximity to the coils 16 and for movement for the very large part of the air along the brine in the pans 42.

There is thus insured a continuous strong circulation and there is also provided means for causing the current of circulating air to pass close to the coils for securing the maximum cooling effect thereof.

One of the problems that is involved in attempting to build a construction of this kind arises from the difficulty in getting access to the coils and to the pans 42.

For meeting this problem, I have hung the partitions 36 as shown, so that they may be swung out of the way somewhat as indicated by the left-hand member 36 in Figure 2, or they may be lifted off the hooks 40, if that becomes necessary.

Also I have provided the sliding mounting of the cooling chambers A on the tracks 28. Some means must be provided for drainage from the members A. Any suitable means may be employed. As an illustration of one structure that may be used, I have shown a short drain pipe 60 arranged to receive drainage from the outlet 32 and to discharge into a funnel 62 at the inner end of a drainage take-off pipe 64.

When the member A is slid toward the position illustrated at the left-hand side of Figure 2, considerable space is provided for permitting access to the pans 42 and to the units 16.

It will be noted that the tracks 28 are inclined downwardly from the walls 12 to their shoulders 30. This structure has several advantages. On account of it, the members A tend to slide toward each other to maintain tight joints when the device is in use. On the other hand, when the members A are slid away from each other, they are also raised

slightly so as to afford easier access to the coils 16.

I intend here to show in my drawings an illustrated form in which my invention may be embodied.

Changes may be made in the details of the construction and arrangement of the parts of my device without departing from the purpose of my invention, and it is my intention to cover by my claims any such changes and modifications which may be reasonably included within the scope of my claims.

I claim as my invention:

1. In a device of the class described, a pair of cooling chamber units, each having a bottom, a side wall, and end walls, said units being arranged with their open sides toward each other, and means for mounting said units for adjustment to permit them to be moved to position for forming a box closed on all four sides or to be moved apart for permitting access to their contents.

2. In a refrigerator, a refrigerator structure having walls and a top combined with a pair of cooling coils hung from the top, having substantially flat upright spaced members, a pair of cooling chamber members, each being adapted to snugly receive one of the coils, said members having each a side wall, end walls and a bottom, the open sides of said cooling chamber members being adjacent each other, and the bottoms terminating short of the open sides of said members, means for mounting said members for sliding movement toward and from each other, so that when they are slid toward each other they form a box having four sides and a bottom with a central opening thereacross.

3. In a device of the class described, a pair of cooling chamber units, each having a bottom, a side wall, and end walls, said units being arranged with their open sides toward each other, and means for mounting said units for adjustment to permit them to be moved to position for forming a box closed on all four sides or to be moved apart for permitting access to their contents, movable partitions for the upper portions of the open sides of said units.

4. In a refrigerator, a refrigerator structure having walls and a top combined with a pair of cooling coils hung from the top, having substantially flat upright spaced members, a pair of cooling chamber members, each being adapted to snugly receive one of the coils, said members having each a side wall, end walls and a bottom, the open sides of said cooling chamber members being adjacent each other, and the bottoms terminating short of the open sides of said members, means for mounting said members for sliding movement toward and from each other, so that when they are slid toward each other they form a box having four sides and a bottom with a central opening thereacross, and movable partitions supported from said top for closing the upper portions of the open sides of said members.

5. In a device of the class described, a pair of cooling chamber units, each having a bottom, a side wall, and end walls, said units being arranged with their open sides toward each other, and means for mounting said units for adjustment to permit them to be moved to position for forming a box closed on all four sides or to be moved apart for permitting access to their contents, and removable brine holding pans for the bottoms of said units.

6. In a device of the class described, a pair of cooling chamber units, each having a bottom, a side wall, and end walls, said units being arranged with their open sides toward each other, and means for mounting said units for adjustment to permit them to be moved to position for forming a box closed on all four sides or to be moved apart for permitting access to their contents, movable partitions for the upper portions of the open sides of said units, the bottoms of said units being inclined, with removable brine holding pans resting upon said bottoms, and means for maintaining said brine holding pans level.

7. In a refrigerator, a refrigerator structure having walls and a top combined with a pair of cooling coils hung from the top, having substantially flat upright spaced members, a pair of cooling chamber members, each being adapted to snugly receive one of the coils, said members having each a side wall, end walls and a bottom, the open sides of said cooling chamber members being adjacent each other, and the bottoms terminating short of the open sides of said members, means for mounting said members for sliding movement toward and from each other, so that when they are slid toward each other they form a box having four sides and a bottom with a central opening thereacross, and movable partitions supported from said top for closing the upper portions of the open sides of said members, the bottoms of said members being inclined and having drainage outlets at their lower parts, brine pans resting on said bottoms, and means for maintaining said brine pans level.

8. In a refrigerator, a refrigerator structure having walls and a top combined with a pair of cooling coils hung from the top, having substantially flat upright spaced members, a pair of cooling chamber members, each being adapted to snugly receive one of the coils, said members having each a side wall, end walls and a bottom, the open sides of said cooling chamber members being adjacent each other, and the bottoms terminating short of the open sides of said members, means for mounting said members for sliding movement toward and from each oth-

er, so that when they are slid toward each other they form a box having four sides and a bottom with a central opening thereacross, and movable partitions supported from said top for closing the upper portions of the open sides of said members, said means being arranged for causing said members to slide in a plane inclined from the horizontal.

9. In a cooling structure of the kind described, a casing, a cooling chamber unit mounted therein having a bottom, end walls, a side wall and an open side, a movable partition for coacting with the open side having its lower edge spaced from the bottom of the cooling chamber unit, said cooling chamber unit being mounted for sliding movement toward and from said partition.

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