H. AUERBACH.

REFRIGERATOR OR ICE CHEST.

APPLICATION FILED OCT. 22, 1913.

1,216,767.

Patented Feb. 20, 1917.

3 SHEETS—SHEET 1.

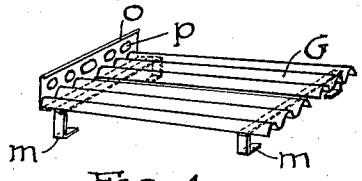


FIG. 4

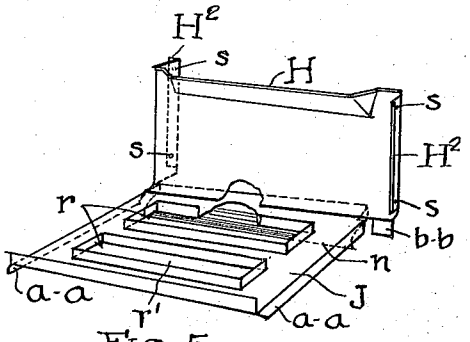


FIG. 5

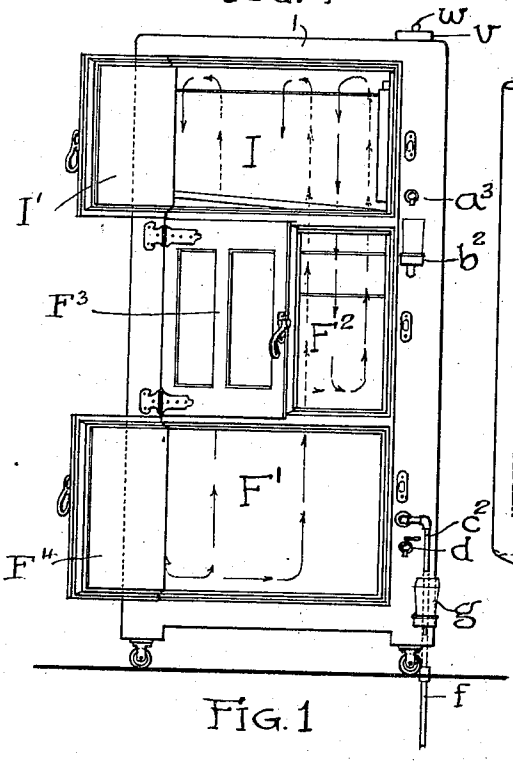


FIG. 1

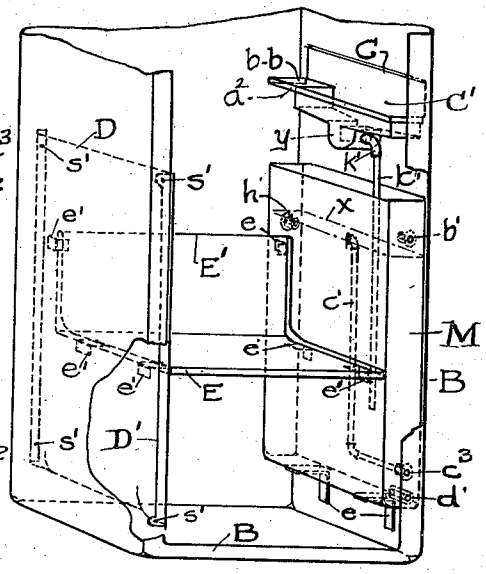


FIG. 2

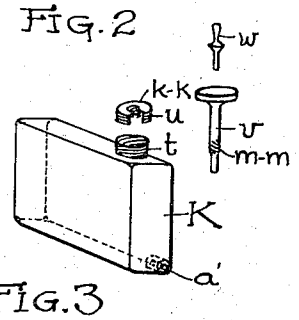


FIG. 3

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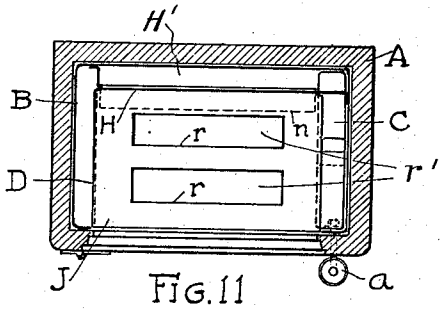


FIG. 11

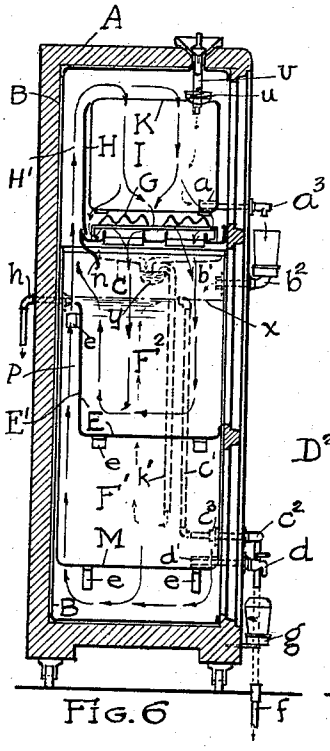


FIG. 6

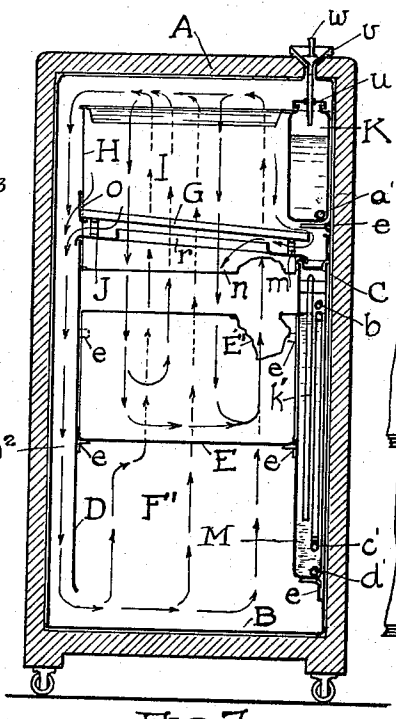


FIG. 7

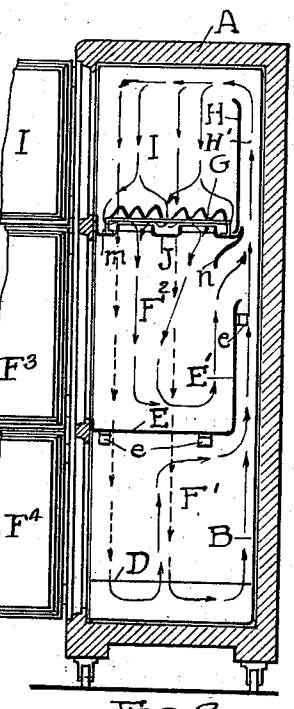


FIG. 8

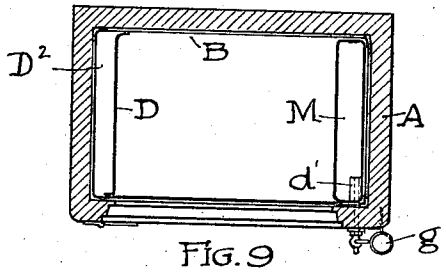


FIG. 9

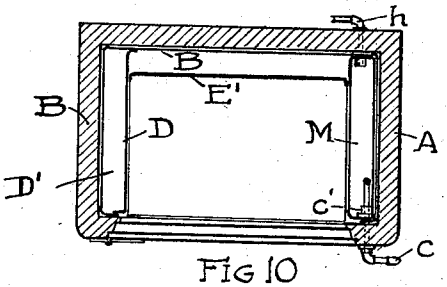


FIG 10

Witnesses:

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3 SHEETS—SHEET 3.

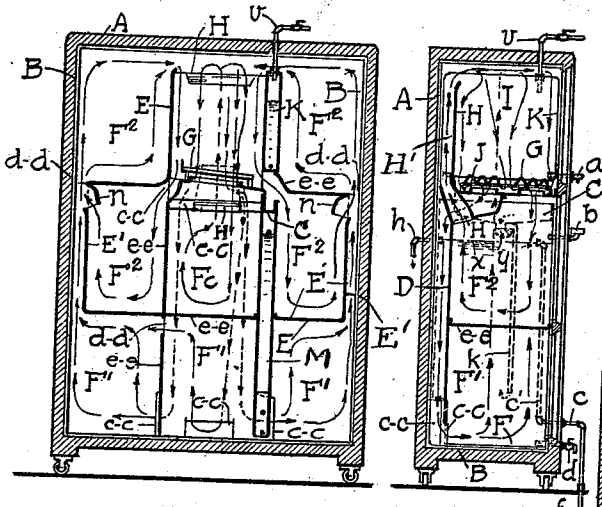


FIG. 12

FIG. 13

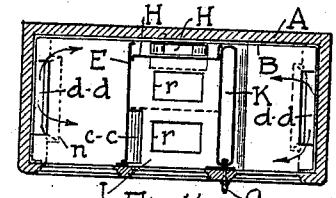


FIG. 14

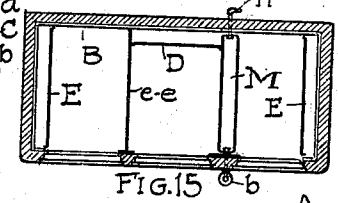


FIG. 15

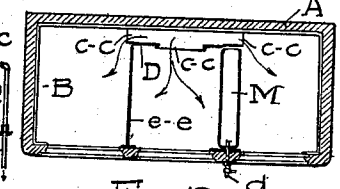


FIG. 16

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HENRY AUERBACH, OF ALBANY, NEW YORK.

REFRIGERATOR OR ICE-CHEST.

1,216,767. Specification of Letters Patent. Patented Feb. 20, 1917.

Application filed October 22, 1913. Serial No. 796,726.

To all whom it may concern:

Be it known that I, HENRY AUERBACH, a citizen of the United States, and a resident of Albany, in the county of Albany and State of New York, have invented a new and Improved Refrigerator or Ice-Chest, of which the following is a full, clear, and exact description.

The present invention relates to refrigerators or ice chests. The object of my invention is to provide a refrigerator in which maximum efficiency may be obtained from the ice supplied thereto, by utilizing the cold air received directly from the melting ice, in a most efficient way.

For this purpose, the refrigerator is divided into separate compartments, and is so constructed that the cold air from the ice will travel in separate currents to the several compartments and the warmer air will travel from the several compartments to the ice compartment, more or less in separate currents but in such manner that the currents from different compartments will accelerate those from other compartments, so that each compartment will be cooled by rapid circulation of the air, and so that odors from foods in one compartment will not affect foods in the others. A separate door is provided for each compartment so that when one compartment is opened the cool air in the others will not escape.

To more fully utilize the ice, and to eliminate the customary drip-pipe and floor pan, an interior tank is provided for the melting ice-water, which helps cool said compartments.

Another object of my invention is to arrange the parts so that the whole device may be readily disassembled for cleaning.

Another object is to provide a drinking water tank and a waste or drip connection in conjunction therewith which will drain into the cold water tank.

In the drawings forming part of this application:—

Figure 1 is a front elevation of a refrigerator as constructed for household use, and embodying my invention in which view, the doors are shown partly or fully opened.

Fig. 2 is a perspective view of the interior lining, removed from the box and of the various parts, in which view, the member C is raised above the tank F to disclose the construction.

Fig. 3 is a perspective view of the drinking water tank and the associated parts.

Fig. 4 is a perspective view of the ice pan.

Fig. 5 is a perspective view of the drip pan and one of the dividing walls.

Fig. 6, is a vertical sectional view through the refrigerator and looking toward the water tank or to the right from the center of Fig. 1.

Fig. 7, is a similar view taken at right angles to Fig. 6 and looking toward the rear of the refrigerator.

Fig. 8 is a vertical sectional view taken in the opposite direction to Fig. 6.

Figs. 9, 10 and 11 are horizontal sectional views taken respectively through the lower, middle and top compartments.

Fig. 12 is a vertical sectional view taken just back of the front wall and looking toward the rear of the refrigerator of larger capacity and having a larger number of compartments.

Fig. 13 is a sectional view thereof, taken at right angles to Fig. 12, and

Figs. 14, 15 and 16 are horizontal sectional views taken, respectively, through the upper, middle and lower tiers of compartments.

Referring to the construction shown in Figs. 1 to 11 inclusive A is the outer casing or inclosing structure, and B is a lining of metal, porcelain or other suitable material, which covers the entire interior of the outer casing except for the door openings. The several dividing walls and floors, tanks, etc., are all placed within this lining B.

In this form of the invention I have shown the refrigerator divided into three different and superimposed compartments, though this number and arrangement are only illustrative since they may be varied as desired.

Within the lining there is shown the lower compartment F′ for the storage of foods, etc.; above this a second compartment F^2 for the storage of foods, etc.; and above this a compartment I for the ice. Each compartment is separated from the others except for the air circulating passages hereinafter described.

The lower compartment is defined partly

by the walls of the lining B; partly by a partition D which defines a cold air flue; partly by the cold water tank M and partly by the shelf E, which latter divides the lower and middle compartments and forms a floor for the latter. The middle compartment is defined by similar members and in addition by the wall E′ which forms a cold air flue; and by the drip pan J. of the ice compartment.

The cold water tank M. rests upon and is supported by brackets *e* so that it lies against one side of the lining B and extends over a substantial part of the depth of both food compartments; and preferably it is as wide as the side wall of the lining B. The shelf E which separates the two lower food compartments rests upon the lugs or brackets *e′* on the side of the tank M and on the lugs *e′* on the side of the wall D; and this shelf may be removed from the refrigerator.

The rear wall E′ is preferably formed integral with the shelf E and it rises upwardly from the latter and is spaced from the rear wall of the lining B to form a flue P for the return of the warm air from the lowest compartment.

The wall D extends from the lower portion of the lowest compartment upwardly to the ice compartment; and it has flanges D′ which are secured to the lining as by the screws *s′* so as to be spaced from the wall of the lining to form therewith a cold air flue D^2 for cold air to pass to the lower part of the bottom compartment.

The drip pan J for the ice, has flanges *a—a* at the sides. It also has upturned flanges *r*, surrounding openings *r′* the purpose of the openings being to permit the cold air to descend from the ice compartment into the upper food compartment, and the flanges *r* are to prevent any water falling on the drip pan from passing through the openings.

The ice pan, G, is shown formed of a corrugated sheet of metal having downward extending supports *m* which rest upon the drip pan J, and support the ice pan.

Above the flanges *r* there is an upward extension *o* on the rear of the ice pan, the purpose of which is to prevent the ice from moving back far enough to interfere with the circulation through the flue D^2, and the holes *p* permit the air to pass through the extension *o*.

There is a rear wall H, extending upward from the drip pan to nearly the top of the ice compartment; and it is separated from the side wall of the lining B to form a warm air flue H′, from the upper food compartment to the ice compartment. This wall inclines inwardly at the top; and at its sides it has oppositelv disposed flanges H^2 which are secured to the walls of the lining B by screws *s*. There are flanges *b—b* at the lower corners of the wall H to make a close contact with the drip pan. There is a curved hood *n*, near the lower edge of the wall H and forming substantially a continuation of the latter.

There is a member C comprising a top or closure for the tank M, and which also comprises a trap *y*. The trap portion *y* of this member extends into the top of the tank M and the flanges a^2 rest upon the top of the tank to close the latter and to support the part C. The latter has a rear wall C′, which rests against the lining.

There is a drinking water tank K shown disposed in the ice compartment, above the tank M. It is provided with a connection *t*, upon which screws a cap *k—k*. The latter has a threaded opening *u*, into which screws a funnel V, by means of which the tank K may be easily filled. The removable stopper *w* is received in the funnel to close the latter and prevent gases and foul air reaching the drinking water. There is a connection a^1, in one end of the tank K to which is connected a faucet a^3, arranged on the outside and to one side of the front of the refrigerator. By means of this faucet drinking water may be drawn from the tank K without opening any compartment. There is a glass holder and drain pan b^2, below the faucet a^3; and it connects by means of a connection *b′*, with the tank M so that all drippings from the drinking water tank drain into the cooling tank M.

Inside the tank M there is a drain pipe c^1 the upper end of which is arranged at the drainage level of the liquid in this tank, as indicated by the dotted lines *x*. This pipe extends down to a connection c^3; and to the latter there is connected a pipe c^2, which extends to the exterior of the refrigerator and at the front. This pipe c^2, may connect directly with the house waste pipe *f*, as indicated in dotted lines in Fig. 1, or, where no waste pipe is provided, the pipe c^2 may drain into a glass *g* below it. In the latter case, the dripping of the water into the glass *g* will indicate that the tank M has become filled to the level *x* and requires to be partly or wholly drained. In addition to the above I prefer to arrange a tap *d*, connected at d^1 with the tank M for draining the latter to the bottom.

To the connection *h′* at the level *x* of the tank M is connected a pipe *h*, which leads to an ordinary sink. This serves to drain the tank to the desired level, but it need not be used where the drain c^2 is used.

There is a pipe *k′* connected with the trap *y* and it extends into tank M to near the bottom of the latter, and it delivers the water from the melting ice received in the member C, to the bottom of the cooling tank M.

Operation: When the parts are assembled in their proper positions, as shown in Figs. 1,

and 6 to 11, the tank M will rest on the supports *e*, and will lie against one side of the lining B substantially coextensive with the height of compartments F^1 and F^2; the wall D will be secured to and lie separated from the opposite wall of the lining; the shelf E and wall E^1 will rest upon the supports e^1 on the tank M and wall D; the member C will extend partly into the tank M. with the flanges a^2—a^2 resting on the top thereof; the drip pan J will rest on the top of the wall D and on the member C, inclining downward from the former to the latter; and the ice pan G will rest on the drip pan.

A supply of ice having been placed on the ice pan and within the ice compartment, the air will circulate in currents as indicated by the several arrows. The full long arrows show the air currents in the foreground; dotted long arrows show the air currents behind surfaces; and dotted short arrows show water currents behind surfaces.

The cooler air from the ice compartment passes downwardly, through the apertures *r* in the drip pan, and into the upper food compartment F^2. This heavier, cool air moves downwardly into this compartment and displaces the warmer air; and the latter passes out of this compartment above the top of the wall E^1, past the draft hood *n*, behind the wall H, and into the ice compartment at the upper part. It is cooled in the latter and is returned to the compartment F^2, the circulation going on continuously.

The cooler air from the ice chamber also passes downwardly from the ice compartment and through the flue D^2 formed between the wall D and the lining, to the lower portion of the lower food compartment F′. This cooler air displaces the warmer air in the latter compartment and it is caused to rise in the flue P formed between the wall E^1 and the lining; and it passes upwardly and into the ice compartment, to be cooled and returned; and the circulation goes on continuously. As the rising air from the lower compartment passes the top of the wall E^1 it meets the air rising from the middle food compartment F^2 and serves to accelerate the flow of the latter and thus to increase the circulation in the middle food compartment.

From the above it will be apparent that the air rapidly circulates through both food compartments; that the warmer air rising from one compartment accelerates the air rising from the other compartment; and that the cool air travels in separate currents and through different channels to the several food compartments. Thus odors from one compartment will not affect the food stored in another compartment.

Access may be had to the ice compartment by means of the door I^1 on the front of the refrigerator. Access may be had to the food compartment F^2 by means of the door F^3 while access may be had to the lower food compartment by means of the door F^4. If only the door F^3 or F^4 is opened at any time the air in only that food compartment will be affected by the inrush of air, because each food compartment is cooled by separate circulating currents and the opening of one compartment will not directly affect the other.

The water from the melting ice falls upon the ice pan and travels down to the member C and enters the same and closes the trap *y*. From the trap the liquid flows down the pipe *k′* into the tank M near the bottom of the latter. The tank M. gradually fills from the bottom upwardly and when the water reaches the desired level such as the line *x* it continues to discharge at this level so long as water from the melting ice is received through the pipe *k′*. From the level *x* the water may pass off through the pipe *h* if this means of drawing the tank be employed; or, it may pass off through the pipe *c* if this means be employed; and in the latter case it will either pass from the pipe c^2 into the drain pipe *f*; or, it will enter the glass *g*, and thus visibly indicate that the tank M is full.

Thus the liquid in tank M. will reach a certain height and will then automatically drain.

The water resulting from the melting of the ice, while not as low in temperature as the ice itself nevertheless is just above 32° in temperature and may be effectively employed for cooling. The disposition of the tank M is such that the cold water acts upon the air in both the food compartments and materially aids in lowering the temperature therein. By reason of the arrangement of the pipes *k′* and c^1 or *k′* and *h*, the cold water enters the tank M at the bottom and it raises the water therein and the water at the top which has been in the tank longest discharges at the level *x*; and thus the most advantageous circulation is obtained in the cooling tank. The trap *y* prevents any gases from rising in the liquid pipes and entering the ice or food compartments.

The drinking water tank K being placed in the ice compartment, the water therein is kept cool at all times and the water therein may be drawn from the faucet a^3, with out opening any part of the refrigerator. The waste and drippings will pass from the pan b^2 and connection b^1 into the tank M to add its cooling influence to the contents thereof.

The several exterior connections are all placed on the side of the front wall away from the door hinges so that the several doors may be opened without interfering with the connections.

The refrigerator may be very readily taken apart for cleaning. To do so, the

drinking water tank K is removed; and its several parts *u*, *v*, and *w* are removed for cleaning. The several screws *s*—*s*[1] are removed. Then the parts G, H, J, C, E, D and M are removed, preferably in the order here named. This leaves only the lining within the casing. The removed parts may be thoroughly cleaned and afterward replaced.

In the construction shown in Figs. 12 to 16 there are nine separate compartments, but the same principles of construction and operation are preserved. The parts in these several views are lettered to correspond with corresponding parts in the first form and a separate detailed description of this form of the invention is unnecessary.

Having described my invention, what I claim is.

1. A refrigerator comprising a receptacle a cooling tank M arranged upright near one wall of the receptacle and removable therefrom, a wall D detachably secured in spaced relation to one of the receptacle walls to form an air flue, a shelf E and rear wall E[1], supported by said tank and said wall D, a member C having a trap and adapted to be partly inserted into said tank and to close the top thereof, and removable ice supporting means supported upon said partition D and said member C and inclining downwardly toward the latter.

2. A refrigerator comprising a receptacle, a cooling tank M arranged upright near one wall of the receptacle and removable therefrom, a wall D detachably secured in spaced relation to one of the receptacle walls to form an air flue, a removable, horizontal shelf E extending between said tank and said wall D to divide the receptacle into compartments and a rear wall E′ extending upwardly from said shelf E and spaced from a wall of the receptacle to form an air flue.

3. A refrigerator comprising a receptacle, a cooling tank M arranged upright near one wall of the receptacle and means for draining the water from the ice compartment into said tank, a removable shelf E dividing said receptacle into compartments, a wall D spaced from one wall of the receptacle to form an air flue coextensive with the compartments divided by said shelf E, a vertical wall E′ extending upwardly from said shelf E and spaced from another wall of said receptacle to form an air flue, means above said shelf E dividing off an ice compartment and an upwardly extending wall H spaced from the same wall of the receptacle as the wall E′ to form an air flue open at the top of the ice compartment.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY AUERBACH.

Witnesses:
S. Boochever,
Joseph Caplan.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."