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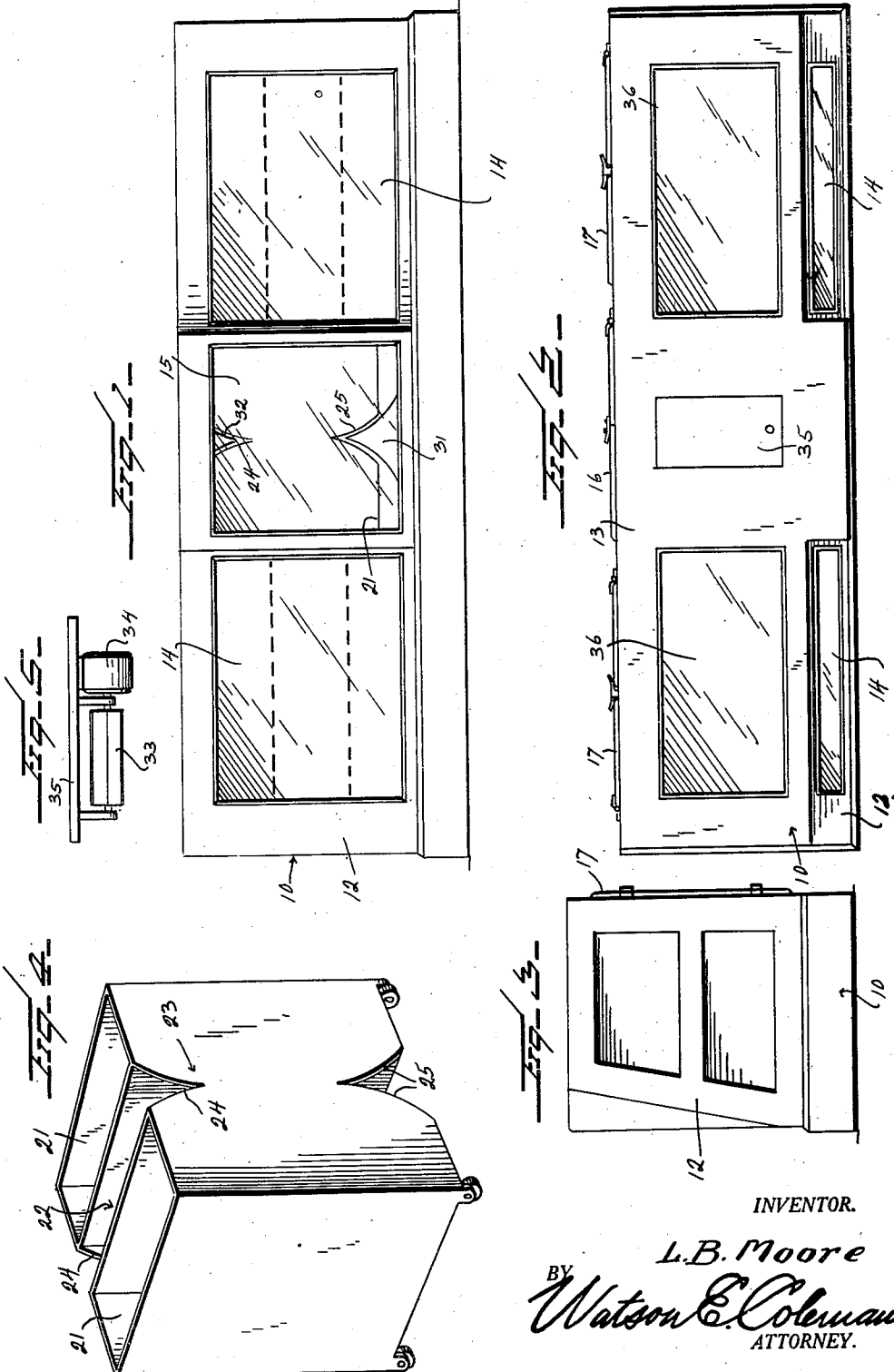
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L. B. MOORE

FREEZER CASE OR REFRIGERATOR

Filed Feb. 2, 1924

2 Sheets-Sheet 1



INVENTOR.

L.B. Moore

BY
Watson E. Coleman
ATTORNEY.

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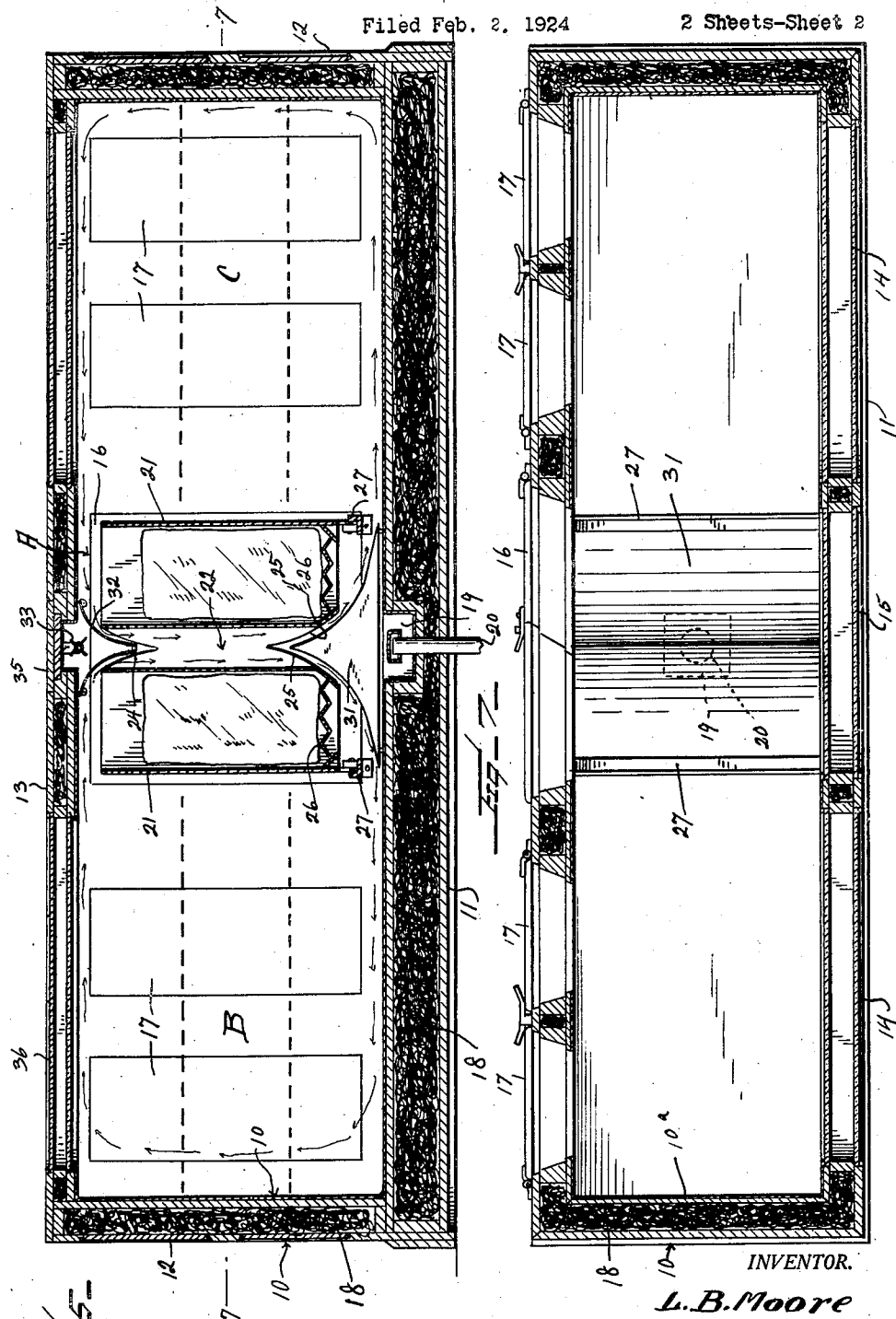
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UNITED STATES PATENT OFFICE.

LOUIS B. MOORE, OF ST. LOUIS, MISSOURI.

FREEZER CASE OR REFRIGERATOR.

Application filed February 2, 1924. Serial No. 690,246.

To all whom it may concern:

Be it known that I, LOUIS B. MOORE, a citizen of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Freezer Cases or Refrigerators, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to refrigerators or ice boxes, and particularly to an ice box or refrigerator of the character used by dealers in meats and other commodities, wherein the refrigerator or freezer has the form of a relatively long and relatively low counter.

The general object of the invention is to provide a construction of this character which is particularly effective in use by reason of the fact that means has been provided for securing a more positive circulation of the air past the ice and over and around the commodities disposed on the shelves of the refrigerator than is the case with any other construction known to me.

A further object is to provide a freezer or refrigerator of this character having means whereby a constant current of air is caused to pass past the ice compartment or compartments beneath the several refrigerating chambers and upward through and back to the ice compartment, the refrigerator being so constructed that there are no pockets or dead places which cause sluggish or stagnant, dead air.

A still further object is to provide a construction of this character having two series of food compartments, means whereby the air in each compartment of the series of compartments is caused to circulate past the ice without any danger of the air from one compartment contaminating or otherwise affecting the air from the other compartment or compartments.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a front elevation of a refrigerator constructed in accordance with my invention;

Figure 2 is a plan view thereof;

Figure 3 is an end elevation thereof;

Figure 4 is a perspective view of the ice compartment;

Figure 5 is a detail view showing the air circulating mechanism;

Figure 6 is an enlarged longitudinal sectional view through the refrigerator;

Figure 7 is a section taken on the line 7—7 of Figure 6, the ice compartment being omitted;

Referring to these drawings, 10 designates an outer casing which may be of any suitable construction and which is shown as rectangular and formed with a base 11, the front, rear and end walls 12, and the top 13. The front walls are shown as provided with two panels, which panels are preferably transparent and designated 14. These panels permit inspection of the contents of the two food compartments. At the middle of the front wall is provided the panel 15 which also may be, if desired, of transparent material and which is disposed opposite the refrigerating or ice compartment. The rear wall of the refrigerator is provided with double doors 16 permitting entrance to the ice compartment and the double doors 17 permitting access to the food compartments.

Referring particularly to Figure 6, which is a longitudinal sectional view, it will be seen that within the outer casing there is an inner casing, designated generally 10*, this inner casing having practically the same form as the outer casing, and between the two casings there is disposed a filling or non-conductive or insulating material 18. I do not wish to be limited to any particular construction for the outer casing or for the inner casing or to any particular filling for these casings, as these details form no part of my invention.

It will be noted from Figure 3 that the front walls of the food compartments are extended downward and forward at an inclination, while the front wall of the ice compartment extends directly downward. This is a mere detail, however. The bottom of the casing 10 is formed with a drainage space 19 from which a drain pipe 20 leads.

Disposed within the casing 10 at the middle of the casing, that is, between the panel 15 and the door 16, there is disposed two more or less conjoined ice compartments 21. These compartments are rectangular in form and are spaced from each other to provide a vertical air passage or chamber 22 between the two compartments. This chamber 22 has its ends closed by the walls 23, the upper ends of these walls being formed with V-shaped notches or cut-away portions 24. The lower ends of these walls are also cut

away to form inverted V-shaped notches 25. The bottoms of the ice compartments 21 are provided with corrugated sheets 26 upon which the ice is supported, and these sheets and supports have openings at intervals whereby the water may trickle out from the ice compartment and pass downward to the drain. These conjoined compartments 21 are supported upon angular braces 27 mounted within the case or box in any suitable manner. The conjoined compartments 21, it will be seen from Figure 6, act to divide the interior of the casing 10 in effect into three compartments A, B, and C as mentioned heretofore, the compartment A being for the ice and the compartments B and C being for the food.

Supported upon the bottom of the main ice chest or refrigerator is a deflector 31. This deflector, as shown particularly in Figure 6, is approximately triangular in cross section but preferably the sides of the triangle are concavely curved and the peak of this deflector extends up into the notches 25 so that the ice in the ice chambers 21 to all intents and purposes rests upon and is supported by this member 31. This member 31 may be made solid or hollow and is preferably made removable and is supported above the floor of the ice chest or refrigerator so as to permit the passage of water into the drainage basin 19 and out through the drainage pipe 20. A triangular deflector 32 is disposed in the inverted V-shaped notches 24 and extends up above the top of the ice compartments 21, as illustrated in Figure 6, and the lateral wings of this triangular deflector extend nearly up to the lower face of the lid of the ice chest.

Disposed immediately above this V-shaped deflector and between the walls thereof is a fan 33 which is formed with longitudinally extending radial blades mounted upon a shaft, this shaft being driven by an electric motor 34 having a very low speed. I do not wish to be limited to an electric motor for driving the fan or to any particular means whereby the speed of the motor may be reduced to the proper speed for the fan. This motor and the fan are supported preferably in bearings carried by a removable lid or door 35 which normally closes an opening in the top of the ice chest.

The circulation of air within this refrigerator will be readily seen from Figure 6. The lower edges of the two side walls of the deflector 32 are not pressed close together but are separated slightly so that the action of the fan is to drive a current of air downward between the side walls of the deflector and downward through the air channel 22. This current of air striking the upper end of the deflector 31 is deflected laterally in two portions or currents, one passing laterally in one direction and the other

laterally in the other direction along the bottom of the chest or refrigerator and beneath the open ends of the compartments B and C. This cold air is forced upward through these compartments and out the top thereof and then travels back again and strikes the deflector 32, being again forced downward into the air channel.

The action of the fan is also to draw this warmed air from over the tops of the compartments B and C and force it downward and thus a constant circulation of air is kept up, this fan acting to increase the circulation of air within the separate provision chambers, forcing the extreme cold air into the upper part of the case by the draft of air being driven down through the central channel, constantly changing the air. I have found by actual experiment that a lower temperature by 10° is secured in my apparatus than in other refrigerators known to me, and in proof of the equalization of the temperature I may say that I have found the temperature on the upper shelf to be the same as the temperature on the lower shelf where the equalizer is operating. Where this equalizing fan and the deflectors are not in use, however, the temperature of the lower shelves is lower than the temperature of the upper shelves. I have found in actual practice that I can obtain a lower temperature by 6° than other devices on the market under equal conditions, that is with an equal number of pounds of ice and with less salt to the hundred pounds of ice, I can secure a temperature lower by 6° than with other devices known to me and preserve the volume of ice for a longer number of hours, thus saving from 10% to 15% on operating. The construction is such that less cleaning is necessary than with the ordinary refrigerator or ice chest and thus saves time and money.

Preferably the ice tanks or receptacles 21 will be mounted upon rollers so that they may be readily rolled into or out of the ice chest to permit the convenient placing of ice therein. With this construction I secure double the amount of refrigeration due to the fact that I utilize the convection from the walls of the air chamber or passage 22 as well as conduction through the outer walls of the ice compartments. It will be seen that with my construction the entire circulation of cold air is directed through one channel, that is laterally through one channel for each lateral compartment, doing away with all broken vents or pockets which cause sluggish or stagnant, dead air, the center air channel 22 causing a draft which has a tendency to draw the returning air from overhead and hasten its descent and re-cool it as it passes through the central chamber 22, to be again driven out into the provision chamber. By using the V-shaped de-

5 flectors, I keep an even, unbroken and unmolested air channel, free of any pockets or air holes, giving the air free passage, the bottom deflector dividing the air equally and
 10 carrying the air entirely into the provision chambers before striking a level, allowing the air to distribute in the provision chamber instead of pocketing under the ice tank. The overhead deflector, extending as it does
 15 down into the central air channel, hastens the circulation of the warm air returning from the farther end of the provision chamber and thus the air which is carried into this downwardly extending channel is at a
 20 lower temperature than if it had been pocketed or sluggishly circulated through the chest. Furthermore, the deflector 31 causes the cold air to confine itself to the walls of the air compartment so that there are really
 25 two streams of air passing down the air channel or compartment 22 and these streams do not mix.

While I have illustrated a construction which I have found to be particularly effective in actual use, as before stated, I do not wish to be limited to the details thereof as it is obvious that many changes might be made in these details and arrangement of parts without departing from the spirit of
 30 the invention.

I claim:—

1. An ice chest of the character described comprising an outer casing, a pair of ice compartments arranged in the middle of
 35 said outer casing, each of said compartments being spaced at its upper and lower ends from the top and bottom of the outer casing and the ice compartments being separated from each other by a vertically disposed
 40 air channel, the channel being open at its upper and lower ends, the remainder of the chest on each side of the ice compartment being formed to provide food compartments, means for directing air from
 45 the air channel laterally across the lower portions of all of said food compartments up through said compartments and back to the upper end of said channel comprising
 50 approximately V-shaped deflecting members disposed respectively at the upper and lower ends of the air channel, the upper deflecting member being hollow and open at its lower end into said air channel, and a motor operated fan disposed above the
 55 upper deflecting member and causing a draft of air downward through said air channel.

2. In a refrigerator, a medially disposed ice chamber, a metallic ice container mounted within said chamber and formed to provide two compartments, the compartments being separated by an air space and the air space being bounded by end walls and the upper ends of the end walls having
 60 downwardly extending V-shaped cut-

away portions and the lower ends of the walls having V-shaped cut-away portions, a deflector supported above the floor of the chest and V-shaped in cross section and having a length equal to the width of the
 70 two ice containers projecting upward into the cut-away portions of the end walls of the air space, a deflector V-shaped in cross section and having its ends disposed in the cut-away portions of the upper ends of the
 75 walls of the air passage, the last named deflector being hollow and having an opening at its lower end, the deflector having its end walls extending above the ice container and into proximity to the top of the ice
 80 chest, the remainder of the ice chest being divided into compartments for food open at the top and bottom, the deflectors acting to cause a circulation of air downward through the air space, laterally in opposite
 85 directions beneath the food compartments, upward through the food compartments, and back to the upper end of the air space, the top of the chest being provided with an opening immediately above the upper de-
 90 flector, and a removable door normally disposed in said opening, a motor, and a fan operated by the motor and carried by said door and normally disposed between the two upwardly divergent walls of the upper
 95 deflector and acting to force air downward between the walls of the upper deflector into the upper end of the air space, and tracks extending transversely across the walls of the refrigerator disposed in proximity to said door, the ice container having
 100 walls engaging said tracks and the ice container being independently movable through the door opening.

3. In an ice chest or refrigerator, an ice
 105 container formed to provide two compartments, the compartments being separated by a vertical air space and the air space being bounded by end walls, the upper and lower ends of the end walls having V-shaped
 110 cut away portions, a deflector supported above the floor of the refrigerator and V-shaped in cross section and having a length equal to the width of the two ice containers and having the cut away portion
 115 of the end walls of the air space accommodating the deflector, a hollow deflector V-shaped in cross section mounted within the refrigerator above the top of the ice container, the V-shaped cut away portion
 120 at the upper ends of the air space accommodating said deflector, and a motor operated fan disposed within the hollow deflector and forcing air downward through the same into the space between the two
 125 ice compartments.

In testimony whereof I hereunto affix my signature.

LOUIS B. MOORE.