

P. A. BAYLESS.
VACUUM REFRIGERATOR.
APPLICATION FILED OCT. 18, 1909.

986,673.

Patented Mar. 14, 1911.

2 SHEETS-SHEET 1.

Fig. 1.

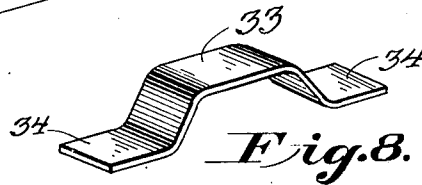
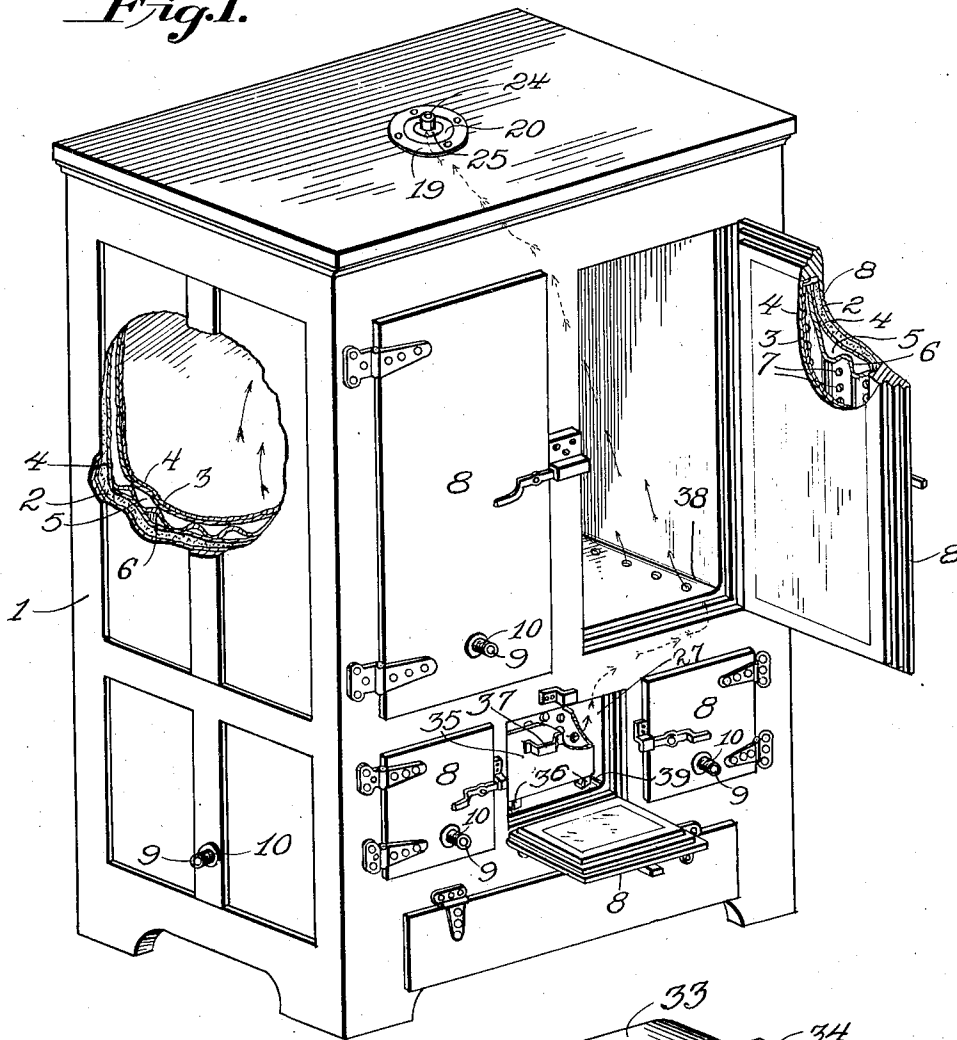


Fig. 8.

Witnesses
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2 SHEETS—SHEET 2.

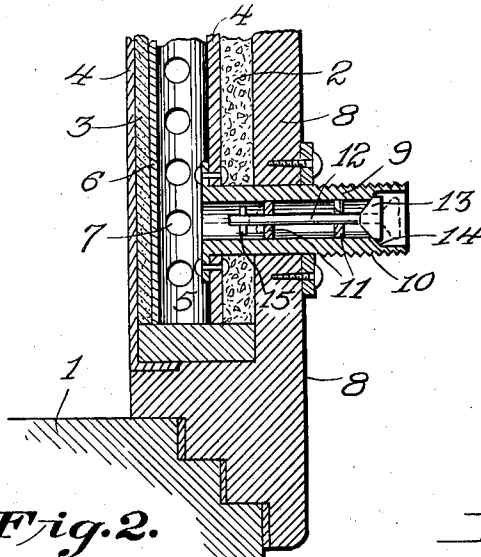


Fig. 2.

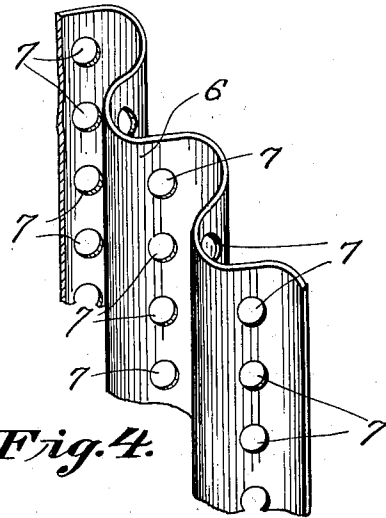


Fig. 4.

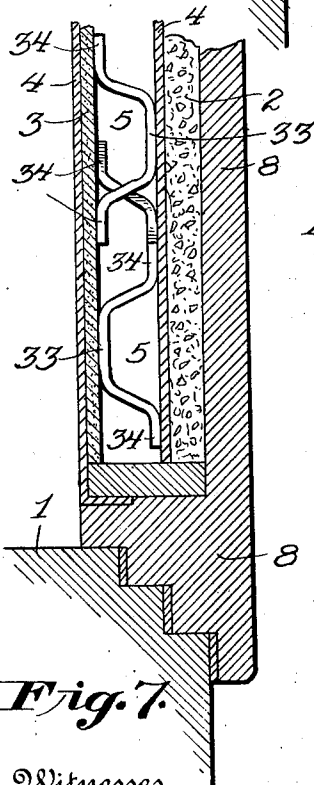


Fig. 7.

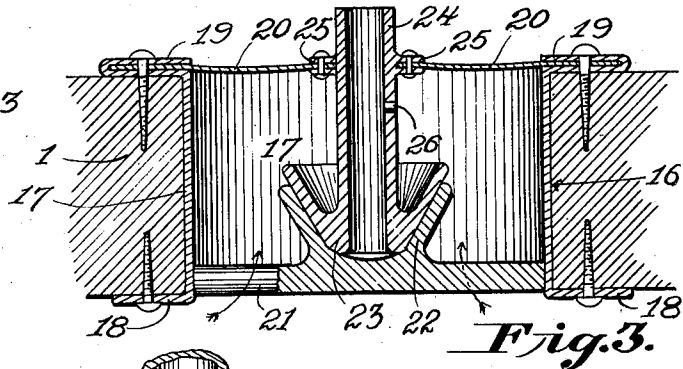


Fig. 3.

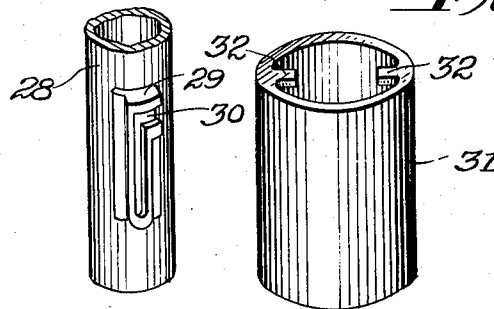


Fig. 5. Fig. 6.

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UNITED STATES PATENT OFFICE.

PATRICK A. BAYLESS, OF OKLAHOMA, OKLAHOMA.

VACUUM-REFRIGERATOR.

986,673.

Specification of Letters Patent.

Patented Mar. 14, 1911.

Application filed October 18, 1909. Serial No. 523,111.

To all whom it may concern:

Be it known that I, PATRICK A. BAYLESS, a citizen of the United States of America, residing at Oklahoma city, in the county of Oklahoma and State of Oklahoma, have invented certain new and useful Improvements in Vacuum-Refrigerators, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to refrigerators, ice boxes, and the like, and the principal object of the same is to provide a structure of the type specified in which the interior thereof is kept at a low temperature by the use of a small amount of ice.

With the above and other objects in view the invention contemplates the employment of a refrigerating structure which is provided with hollow walls, doors, &c., which are lined with heat and cold insulating material and provided with means whereby the air may be exhausted from the same thereby creating a vacuum chamber which entirely surrounds the structure.

The invention also contemplates the employment of novel means for bracing the hollow walls, doors, &c., so that the same will not collapse, and also means whereby the air from the storage chamber may be automatically released, such for instance, as when an inrush of air is caused by suddenly closing a door, and also whereby a limited amount of the air from the storage chambers is permitted to escape to prevent said chambers becoming foul.

In carrying out the objects of the invention generally stated above it will be understood, of course, that the essential features of the same are necessarily susceptible of changes in details and structural arrangements, certain preferred and practical embodiments of which are shown in the accompanying drawings, wherein—

Figure 1 is a perspective view of an ordinary household refrigerator embodying the present invention. Fig. 2 is a fragmentary vertical sectional view of a door thereof showing the vacuum chamber therein, the bracing therefor, and the air-exhausting means. Fig. 3 is a view similar to Fig. 2, showing the automatic air releasing means for the storage chambers. Fig. 4 is a detail perspective view of the preferred type of sheet metal bracing employed for the hollow walls of the vacuum chambers. Fig. 5 is a

detail fragmentary perspective view of the drip pipe for the ice chamber of the refrigerator. Fig. 6 is a similar view of a detachable cap for the drip pipe. Fig. 7 is a view similar to Fig. 2, but showing a modification of the bracing means for the vacuum chambers. Fig. 8 is a detail perspective view of the bracing means shown in Fig. 7.

In the accompanying drawings the invention has been shown embodied in a conventional type of refrigerator, but it is to be understood that the same may be used in connection with refrigerator cars, ice boxes, cold storage receptacles, and various other structures wherein the interior is to be kept at a low temperature.

Referring to said drawings by numerals 1 designates the body of the refrigerator which may be of wood or metal and which is preferably porcelainized. Said body is composed of inner and outer walls, the outer walls being lined with packing material on their inner surface, said packing designated by the numeral 2 being preferably composed of asbestos and cork or sawdust. The outer surface of the inner wall is lined with sheet asbestos 3, and both the sheet asbestos and the packing may be covered with sheet metal 4 which has been porcelainized. This arrangement of insulated inner and outer walls provides a chamber 5 in which bracing material such as corrugated sheet metal plates 6, are placed, said bracing sheets being provided with openings 7 and bearing upon said walls so that the same will be strengthened to resist the pressure of the outside air when a vacuum has been created in said chamber.

The doors 8 of the refrigerator and other parts which control access to the interior of the refrigerator are constructed similar to the described construction of the walls of the body and are also similarly braced by the corrugated sheet metal, hence it is thought that the detailed description of the construction of the walls of the body will suffice for a full understanding of the construction of said doors and other parts.

The walls of the body and the doors are each provided with a pipe 9 the flanged inner end of which is bolted or otherwise fastened to the inner surface of the outer wall, said pipe projecting exteriorly of the refrigerator and being externally threaded, as indicated at 10 by means of which it may be readily attached to a suitable suction pump to withdraw the air from said hollow

walls. Internally, said pipe is provided with guides 11 for the stem 12 of the valve 13 and also with a valve seat 14 adjacent its outer end. The inner end of the valve stem is provided with a pin or key 15 which contacts with the inner guide to limit the outward movement of said stem, the inward movement of the stem being limited by contact of said valve with its seat. The valve opens outwardly, as indicated in dotted lines in Fig. 2 and is opened by the suction of the air withdrawing pump, and closes by the pressure of the outside air when said pump is detached from the pipe 9.

The body of the refrigerator is provided with a chamber 16 in its top which is lined with sheet metal 17. Said chamber is preferably cylindrical and the lining 17 therefor has its lower end outturned to form an annular flange 18 which is bolted or otherwise secured to the undersurface of the top of the body. The upper end of said lining is also outturned and crimped to form clamping jaws 19 which are bolted or otherwise fastened to the outer surface of the said top, said jaws holding the edge of a flexible diaphragm 20, which may be of silk or other suitable material, stretched across the top of said chamber 16. A supporting bar 21 extends centrally across the lower end of said chamber 16 and carries a centrally located upstanding cup-shaped valve seat 22 which normally supports a similar shaped valve 23 carried by the lower end of a hollow valve rod 24 which projects through the central portion of said diaphragm 20 and is provided with an annular clamping flange 25 which is riveted or otherwise fastened to said diaphragm. The valve stem projects well above the diaphragm so that the air discharged therefrom will be delivered away from the same. Said stem and valve are preferably integral and the opening through the stem is continued through the valve and is closed when the valve is seated in the cup-shaped seat as is shown in Fig. 3. A lateral opening 26 is formed through the valve stem, said opening communicating with the central opening of said stem and is located below the diaphragm so that a constant, but small, amount of air is being delivered through the stem to the chamber 16 and from the said chamber to the interior of the refrigerator; said opening also serving as an escape for the foul air from the refrigerator.

The chamber 16 is in communication with the storage chambers of the refrigerator and it will be understood when an abnormal amount of air is forced in said chambers, such as by the sudden closing of the doors, the pressure of said air will expand the diaphragm 20 and thereby lift the valve 23 from its seat 22 and permit said excess air to escape through the hollow valve stem 24.

The ice chamber 27 is provided with a pendent drip pipe 28 (see Figs. 5 and 6) which projects through the lower portion of the body 1 and is provided with side lugs 29 having bayonet slots 30 formed in them by means of which a cap 31 provided with inwardly projecting lugs 32 is detachably supported about the outlet end of said pipe. This cap 31 is adapted to receive the water from the pipe and allow it to overflow into the usual drip pan, not shown, and as will be obvious, may be readily detached so that the sediment which settles therein may be cleaned out.

In Figs. 7 and 8 the bracing means for the hollow walls has been shown as composed of a plurality of strips bent to form a substantially U-shaped body 33 having outturned ends 34. These strips are arranged in staggered relation, as shown in Fig. 7, with their outturned ends bearing against one side of the hollow wall and their body bearing against the opposite side of said wall. This arrangement of strips is provided so that they will not interfere with the air being withdrawn from the hollow walls, the openings 7 of the corrugated sheets 6 being provided for the same purpose.

The ice for the ice chamber is retained in a receptacle 35 having openings formed through it for the escape of the cold air and also for the escape of the meltage, said receptacle being provided with legs 36 so that it will be retained raised from the bottom of said chamber, and also provided with a handle 37 by means of which it may be readily withdrawn from the ice chamber.

Both the provision chamber and the ice chamber have their corners rounded as indicated at 38 and 39, respectively, in Fig. 1 of the accompanying drawings, which obviously greatly facilitates the cleaning of said chambers.

What I claim as my invention is:—

1. A refrigerator comprising a body provided with storage chambers and an upper valve chamber, a flexible diaphragm covering said upper chamber, a hollow valve stem carried by said diaphragm, a valve carried by said rod, a seat for said valve in said chamber, said diaphragm being adapted to be actuated by the excess air of the storage chambers to raise said valve from its seat to permit said excess air to escape through said valve stem.

2. A refrigerator comprising a body provided with storage chambers and an upper chamber in communication therewith, a flexible diaphragm covering said upper chamber, a valve seat in said upper chamber, a valve stem carried by and projecting through said diaphragm, a valve for said stem, said stem and valve having an opening formed through them, whereby when 130

the diaphragm is actuated by the excess air from said storage chambers, the valve will be lifted from its seat to permit said excess air to escape through said valve and stem.

5 3. A refrigerator comprising a body, walls therefor arranged in spaced relation to provide a vacuum chamber, bracing means interposed between said walls, and an insulated lining for one of said walls com-

posed of a mixture of cork and asbestos 10 and a covering of sheet asbestos.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

PATRICK A. BAYLESS.

Witnesses:

MABEL F. PARSONS,
FRANK BAYLISS.