April 11, 1939. A. A. VLCEK 2,153,682

REFRIGERATOR

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FIG-1

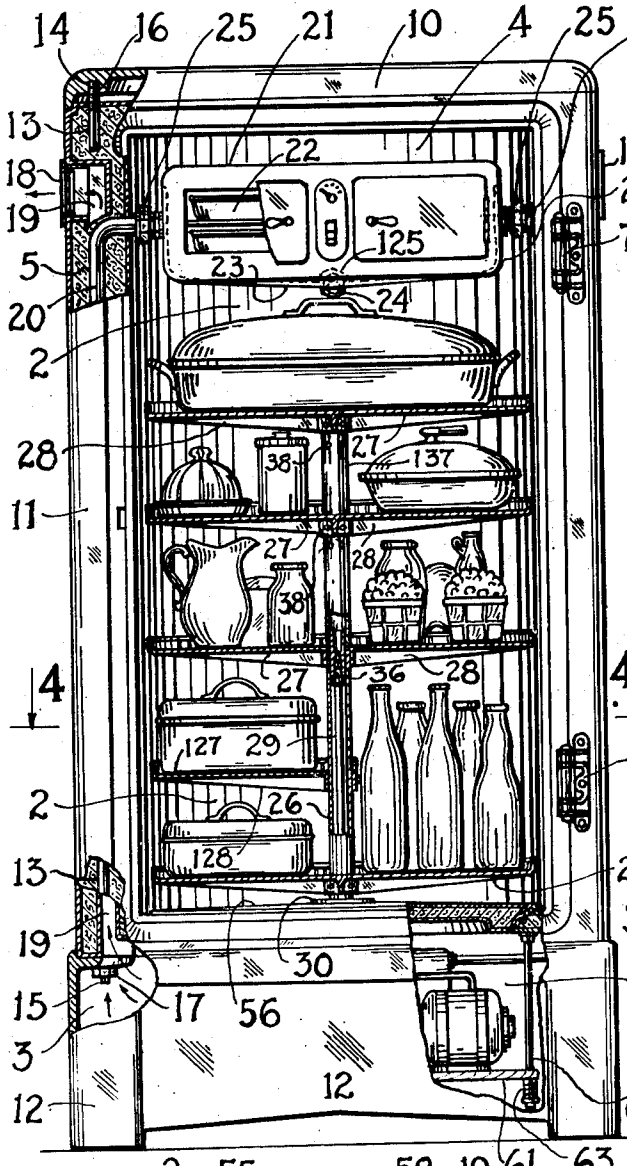


FIG-2

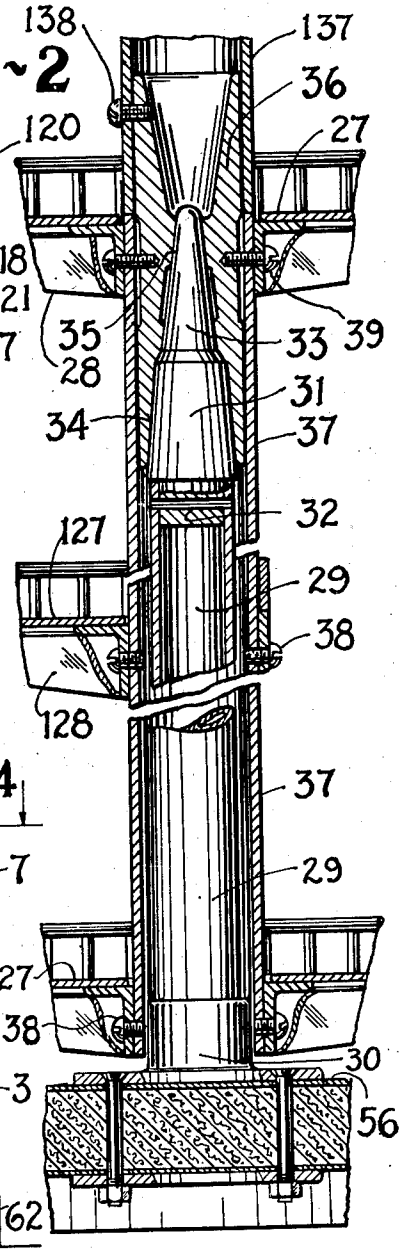
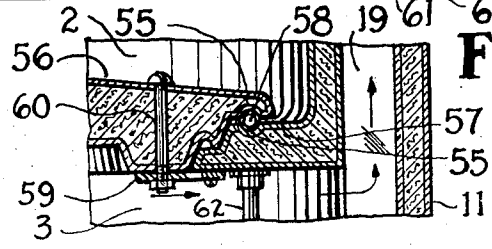


FIG-3



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REFRIGERATOR

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FIG-4

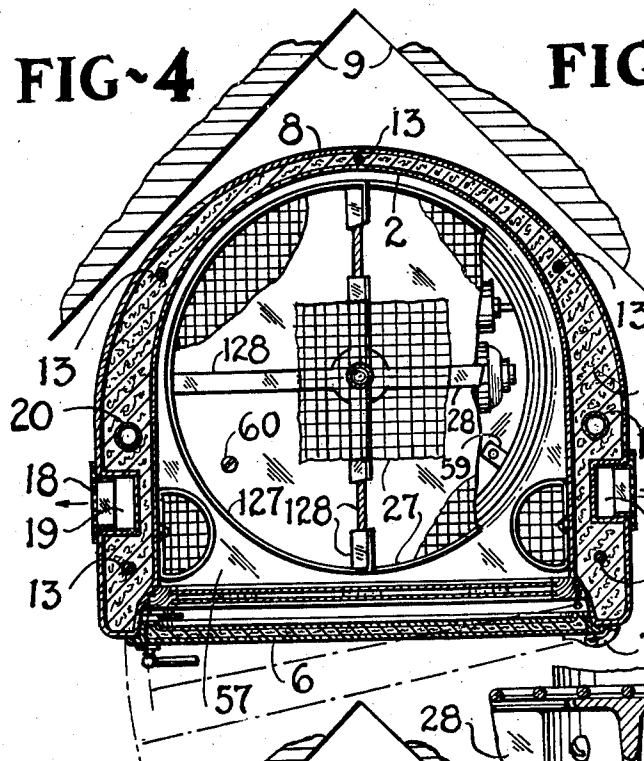


FIG-5

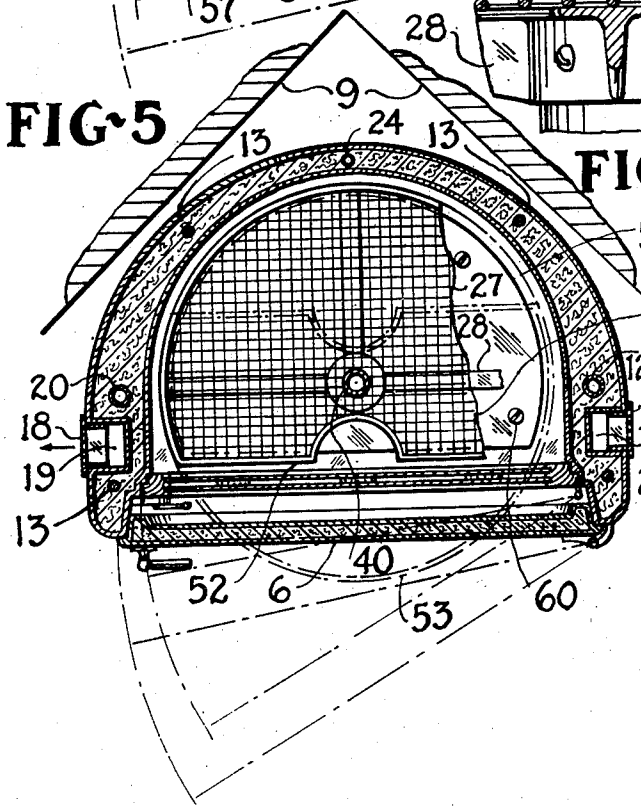


FIG-6

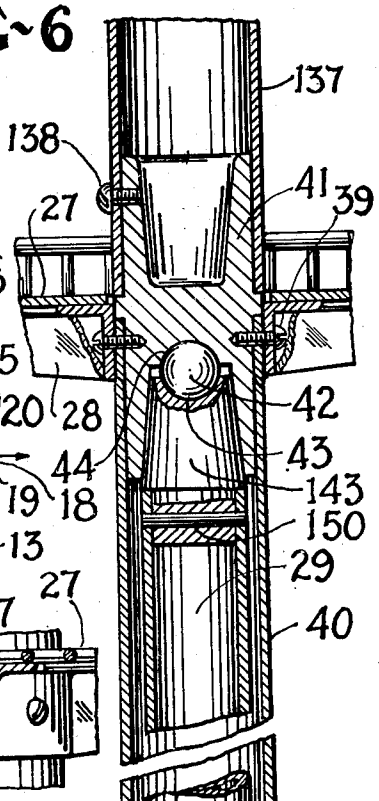


FIG-7

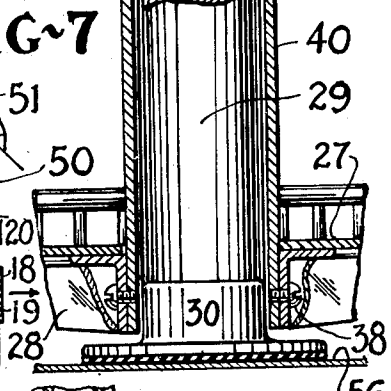


FIG-8



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Patented Apr. 11, 1939 2,153,682

UNITED STATES PATENT OFFICE

2,153,682

REFRIGERATOR

Adolph A. Vicek, Cleveland, Ohio

Application April 30, 1935, Serial No. 18,977

1 Claim. (Cl. 312—183)

My invention is an improvement in refrigerators and relates more particularly to those of the household type.

One of the objects of my invention is to construct a refrigerator which is particularly designed for use in places where available space is limited; such as in the corners of a room.

Another object of the invention is the provision of rotatable shelves within the refrigerator whereby ready access may be had to articles on all parts of the shelves.

A further object is the simplicity of construction and arrangement of parts, and the easy assembly and disassembly of certain parts of the same for cleaning or repair.

Another object is to construct a refrigerator, preferably of the so-called iceless type, in which the refrigerating mechanism is so arranged as to afford a maximum of storage space within the refrigerator.

Other objects and advantages of my invention will become more apparent from the following description of two embodiments thereof, reference being made to the accompanying drawings in which like reference characters are employed to designate like parts throughout the same.

In the drawings:

Figure 1 is a front elevation of one embodiment of my invention, with the door removed and partly in section, and shows the general arrangement of the parts constituting the refrigerating apparatus of the iceless type;

Figure 2 is an enlarged detail elevation of the shelf supporting standard;

Figure 3 is an enlarged section showing the removable bottom or floor of the refrigerator and the manner of fastening it in place;

Figure 4 is a horizontal section through the refrigerator taken on line 4—4 of Figure 1;

Figure 5 is a similar section of a second embodiment of the invention in which the shelves may be rotated to partially extend through the doorway of the refrigerator when the door is open;

Figure 6 is an enlarged elevation of a modified form of shelf support and bearing for rotatably supporting the same;

Figure 7 is a fragmentary detail view of the manner of detachably fixing one of the shelves on the support or standard; and,

Figure 8 is a fragmentary detail section through the door or closure.

In carrying out my invention, I provide a body or container 1 having a food compartment 2, a motor and pump compartment 3 below the compartment 2 and a refrigerating or freezing compartment 4 located in the uppermost part of and within the food compartment.

The walls of the body 1 may be insulated against heat as at 5 in the usual manner, and an insulated door 6 is hinged to the body at 7 to close the opening in the front thereof.

The body 1 is substantially semi-cylindrical or U-shaped in cross section as illustrated in Figure 4, the curved rear wall 8 being so designed to permit the body to fit more snugly in a room corner such as at 9. This is a very desirable feature of the present invention, since a larger refrigerator can thus be used in a room where available space is extremely limited.

It is to be noted that the box or body 1 is constructed primarily in three units, a top unit 10, an intermediate storage and refrigeration unit 11, and a lower supporting unit for receiving the motor, pump and other mechanical units of the refrigerating mechanism. These three units are separable, but are secured together by suitable means. One form of such securing means may consist of tie rods 13 spaced around the body as illustrated more clearly in Figure 4. The ends of the rods are threaded at 14 and 15, the upper ends adapted to be screwed into threaded sockets 16 in the top unit, and for receiving lock nuts 17 on their lower ends which project down into the motor compartment.

The body 1 is also provided with a plurality of vents 18 to carry off the relatively warm air from the motor compartment. These vents communicate with the motor compartment through the conduits 19 provided in the body 1. These conduits are, of course, surrounded by the insulating material 5 and the warm air is thus carried to a higher level through the walls of the box without any deleterious effect on the same. Otherwise this air could not readily escape from the compartment 3 and would under such conditions reduce the efficiency of the unit therein.

Conduit 20 carries the refrigerant from the lower chamber 3 to the refrigerating unit 21 and the conduit 120 carries the spent refrigerant back to the chamber 3.

To avoid the use of drip pans I have provided a unit 21 for housing the refrigerating coils (not shown) and the ice cube trays 22, and which is also provided with downwardly inclined bottom or drain walls 23 which convey the drip to a discharge conduit 24. This conduit may pass downwardly through the box and out at the bottom and have connection with a secondary drain pipe or coil with trap leading to floor drains in-

stalled in homes for refrigerators through a wall of the home to the outside. The refrigerator may thus be defrosted without attending the drip, this being automatically carried off.

The unit 21 is supported in the uppermost part of the compartment 2 and is supported rigidly by the side connections 25 which also serve to connect the refrigerant delivery and discharge conduits and the drip discharge connection 125 in rear.

In the form of my invention shown in Figures 1 to 4, I provide a standard 26 located near the vertical axis of the body 1, and which may be removed readily from the box. This standard carries a plurality of article supporting trays or shelves 27 of disc-like formation and having peripheral retaining flanges 28. In Figure 2 I have illustrated the construction of the standard in more detail, in which the fixed standard section 29 is supported vertically on a base 30 secured to the bottom wall or floor of the box. This section terminates at its upper end in a substantially conical bearing member 31 which is removably fixed in the tube 29 by means of a pin 32. Two conical bearing faces are shown at 31 and 33 and are adapted to engage the internal surfaces 34 and 35 respectively of the bearing unit 36. The surfaces of the male bearing converge upwardly, so that the weight of articles on the shelves 27 will be transmitted through the member 36 to the bearing 31.

The shelf supporting means is preferably composed of sections which are readily assembled into a single unit and which may be quickly disassembled to remove the sections from the interior of the body 1.

The rigid standard 29 is fixed in the floor member 55 of the body and, as explained above, terminates in the bearing members 31 and 33 at its upper end, and constitutes one section of the support. Another section includes the sleeve 37 which removably carries the internal bearing member 36 in its upper end. This section is telescoped over the bearings 31 and 33 and is thus rotatably supported thereon. The shelves 27 on the sleeve 37 are secured thereto by means of the set screws 38.

The upper section comprises a tube 137 which at its lower end fits snugly over the upper end of the internal bearing member 36 and may be secured thereto by means of a set screw 138. The circular shelves 27 on the upper section are held in place by means of the set screws 38 operating in selective openings in the tube 137 and are thus adjustable vertically thereof and are easily removable.

To remove the sections, the upper section is released by removing the screw 138 and the section pulled upwardly to unseat the upper end of the bearing member 36 from the lower end of the tube 137. The intermediate section may next be removed by sliding it upwardly on the fixed standard 29. Of course the various shelves 27 may be removed independently from their axial supports by releasing the set screws 38.

Thus it will be seen the disc-like trays or shelves are freely rotatable on the standard 29 through the bearing 36 and 31, and that this entire assembly may quickly and easily be dismounted for cleaning or repair.

Referring now more particularly to Figure 6, I have shown a modified form of bearing for supporting the sleeve 40 and bearing member 41. The bearing in this instance may be a ball 42 freely rotatable and seated loosely in a depression 43 in the head 143 fixed to the standard 29 by the pin 150. A similar depression 44 is formed in the member 41 and engages the spherical surface of the ball as shown to support the load.

In Figure 5 I have illustrated a second embodiment of my invention which is quite similar to that described in connection with Figures 1 to 4 inclusive but which differs in that the depth of the body 1 is less than the diameter of the trays or shelves 50. The periphery of each of the shelves is circular or curved at 51 throughout the greater extent thereof but is flat or in a substantially straight line as at 52. When the door 6 is closed the shelves will be in the position shown in Figure 5 with the straight edge 52 substantially parallel to the plane of the closed door.

When the door is opened, the operator may have ready access to articles on the rear of the shelves by simply rotating them substantially 180° to the dotted line position at 53. This part of the shelves then intersects the plane of the door, if closed, and thus prevents closing the door until the shelves are returned to the normal position shown in this figure.

In Figure 3 I have shown in larger detail the manner of sealing the floor or bottom in the body 1. An annular seat 55 is formed in the floor section 56 and in the body wall 57 and is adapted to receive a gasket or packing 58. The body wall 57 underlies the floor section and supports it as shown. Suitable clamping straps 59 carried by the bolts 60 and bridging the under surface of the floor and portion 57 are provided at intervals.

The motor, pump and coils in the lower compartment 3 are supported on a baseboard 61 suspended by rods 62 from the body 1. Springs 63 carried by the rods 62 will reduce vibration due to the operation of the motor and pump.

It will be seen that by my invention I have provided an extremely simple and efficient refrigerator construction, which lends itself to low cost of manufacture and high production methods. Furthermore, the utility of the device is increased because of its easy adaptability for use in limited space, as well as for cleaning and repair.

Various changes in the details of construction and arrangement of parts may be made without departing from the spirit of my invention or the scope of the appended claim.

I claim:

In a refrigerator, a cabinet, a shelf support within the cabinet and comprising a non-rotatable standard fixed to the base of the cabinet but free of the cabinet at its upper end, a bearing carried by the standard at its upper end, a tubular shelf carrying member telescoping said standard and said bearing, a removable bearing member adjustably mounted within the tubular member and cooperating with said other bearing to freely and rotatably support the tubular member on the standard, and means for adjustably securing at least one tray, the tubular member and said removable bearing member together as a unit.

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