

Dec. 17, 1957

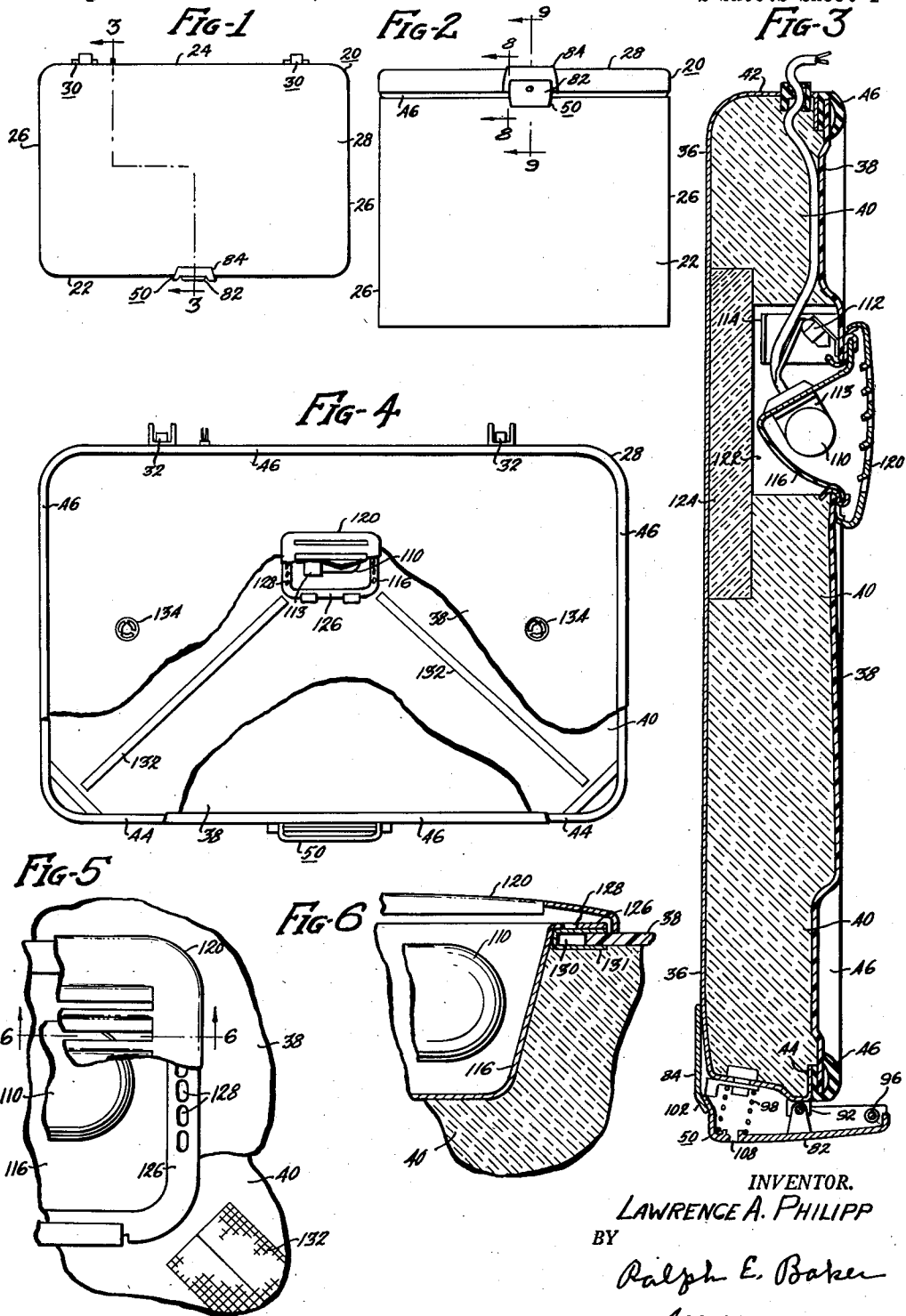
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2,816,318

HINGE FOR LOW-TEMPERATURE CABINETS

Original Filed March 17, 1953

2 Sheets-Sheet 1



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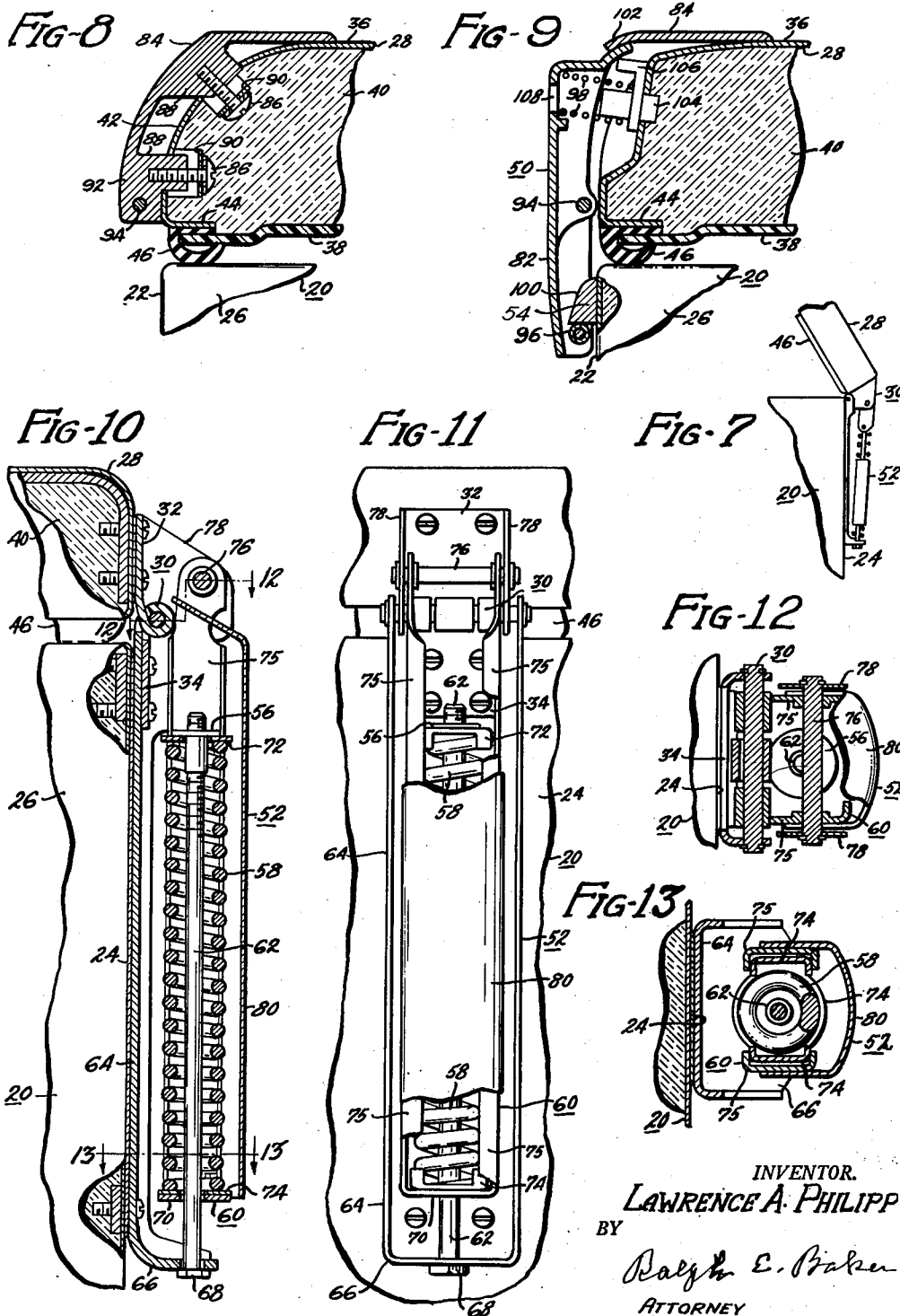
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## HINGE FOR LOW-TEMPERATURE CABINETS

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Original application March 17, 1953, Serial No. 342,911.  
Divided and this application October 27, 1953, Serial No. 388,553

1 Claim. (Cl. 16—190)

This invention relates generally to refrigerating apparatus and particularly to home freezers.

This application is a division of my co-pending application Serial No. 342,911, filed March 17, 1953, for Refrigerating Apparatus, now abandoned.

An object of the present invention is to provide for a home freezer lid, an improved arrangement of a lid counterbalance operable to raise the lid, and a spring loaded lid latch of a character such that a person having both hands occupied, for example, carrying packages to the freezer, may bump the latch in such a way as to release the lid for raising by the counterbalance.

Another object of the invention is to provide an improved arrangement of a home freezer lid counterbalance on the cabinet such that the counterbalance will be efficient without being an obstruction to the user.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred form of the present invention is clearly shown.

In the drawings:

Fig. 1 is a plan view of a home freezer, embodying features of my invention;

Fig. 2 is a front view of the home freezer;

Fig. 3 is a cross-sectional view of the home freezer lid, taken along the line 3—3 of Fig. 1;

Fig. 4 is a bottom view of the lid having parts broken away;

Fig. 5 is an enlarged fragmentary view of a detail of the lid construction;

Fig. 6 is a fragmentary sectional view of the lid, taken along the line 6—6 of Fig. 5;

Fig. 7 is a fragmentary elevational view of the home freezer showing the lid in open position;

Figs. 8 and 9 are fragmentary vertical sectional views of the home freezer, taken respectively along lines 8—8 and 9—9 of Fig. 2;

Fig. 10 is a vertical sectional view of the home freezer and lid counterbalance;

Fig. 11 is a fragmentary rear view of the home freezer and lid counterbalance; and

Figs. 12 and 13 are cross-sectional views of the counterbalance, taken respectively along the lines 12—12 and 13—13 of Fig. 10.

Referring to the drawings by characters of reference, the numeral 20 designates in general a freezer cabinet of the home, food freezer type having a front wall 22, rear wall 24, and end walls 26. An access opening in the top of the cabinet is closed by a lid 28 which is hinged to the cabinet rear wall 24 by spaced hinges 30. Each of the hinges 30 comprises an upper hinge butt 32 which is secured to the rear edge of the lid 28, and a lower hinge butt 34 which is secured to the cabinet rear wall 24.

The lid 28 includes an outer casing 36 and an inner panel 38 which together form a hollow lid structure of generally rectangular shape. Heat insulation 40 is pro-

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vided in the hollow lid 28 to decrease heat seepage into the cabinet. The casing 36 may be made of sheet material such as sheet steel, and the inner panel 38 is preferably made of a low heat conductive sheet plastic material. Around its periphery, the casing 36 has a flange 42 formed with a flange reinforcing portion and seat 44 for the inner panel 38. A seal 46 fits onto a margin of the inner panel 38, and the seal and panel 38 are attached to the casing reinforcing flange portion 44. Sheet metal screws (not shown) or any other suitable means, may be used to attach the panel 38 and seal 46 to the lid casing 36.

In order that access may be conveniently had to the interior of the cabinet 20, I provide a readily releasable latch 50 for the lid and a lid counterbalance in the form of two thrust devices 52 which are adapted to raise the lid to full open position upon release of the latch 50. The counterbalance thrust devices 52 are mounted in spaced relation on the cabinet rear wall and are arranged to act on the lid 28 respectively through the lid hinges 30. The latch 50 is mounted on the front edge of the lid 28 and in latched position cooperates with a keeper 54 which is secured to the cabinet front wall below the latch.

Each of the counterbalance thrust devices 52 comprises in general an abutment or nut 56, a thrust member or coil spring 58, and a force transmitting member or strap 60. The nut 56 is connected to the cabinet 20; the strap 60 is connected to the lid 28; and the spring 58 is under compression between the nut and strap, acting to raise the lid 28. The nut 56 is held to the cabinet by a vertical rod 62 onto the upper end of which the nut is screwthreaded, and by a bracket 64 which in the present construction is integral with and extends downwardly from the hinge leaf 34. At its lower end, the bracket 64 has an outturned leg 66 which is provided with a clearance aperture to receive the rod, and the rod has a head 68 that engages the underside of the leg 66 to limit upward movement of the rod by the spring 58. The strap 60 has a horizontal base or web 70 which is apertured to receive the rod 62 and against which the spring thrust is directed. Upper and lower spring retainers 72 and 74 respectively are preferably provided for the ends of spring 58, the upper retainer 72 preferably being secured such as by welding to the nut 56. Extending upwardly from the strap base 70 are oppositely disposed strap members 75 which are pivotally connected at their upper ends by a pin 76 to spaced rearwardly extending lever arms 78 that are integral with the lid hinge butt 32. As shown, the strap members 75 are channel-shape to give added rigidity to the straps, and the spring retainers 72 and 74 are also channel-shape to fit complementary to the straps so as to prevent turning of the retainers 72 and 74. A sheet metal cover 80 is preferably provided to cover the spring 58 and strap. It will be understood that by turning rod 62, the vertical position of the spring abutment or nut 56 may be changed, thus to change the thrust of the spring 58.

The latch 50 has a latch member 82 which is mounted on the front edge of the lid 28 by a bracket 84. As shown in Fig. 8, the bracket 84 may be a casting, shaped to conform to the rounded front edge of the lid and may be securely held to the lid by screws 86. In the present construction, the bracket 84 is formed with rearwardly extending bosses 88 which project into the lid casing 36 and are held by the screws 86 to sheet metal brackets 90 that may be welded or be otherwise secured to the lid casing. The bracket 84 is recessed in its front face or has horizontal spaced bosses 92 between which the latch member 82 is positioned and to which the latch member is pivotally connected by a horizontal pivot pin 94. As shown in Fig. 9, the latch member 82 carries a catch 96 at its lower end, and a coil spring 98 acts against the upper lever arm of the latch member

82 to urge the catch 96 into holding relation with the underside of the keeper 54. A slanted cam surface 100 on the front of the keeper 54 is engaged by the catch 96 on closing of the lid, and to reduce friction between the parts, a roller type of catch is preferably used. Proper position of the latch member 82 to engage the cam surface 100 on closing the lid is assured by providing a stop 102 on the latch bracket to engage and limit movement of the upper end of the latch member 82 by the spring 98.

Carried by and adjacent the top of the lid is a key operated lock having the usual lock barrel 104 and rotatable lock bolt 106. The lock barrel 104 is secured in and to the front edge of the lid and the bolt 106 is arranged so that when in locked position it engages the upper end of the latch member 82 to prevent release of the latch member from the keeper 54. A key receiving aperture 108 is provided in the latch member 82 in alignment with the key slot of the lock barrel 104. Surrounding the aperture 108 is one end of the spring 98 arranged to abut the latch member 82, and the other end of the spring 98 surrounds the lock barrel 104 and seats against the lock bolt 106. As shown in Fig. 9, the latch member 82 is pivoted substantially midway of its ends to provide suitable leverage in the upper arm such that a user may readily release the latch by bumping against the upper lever arm.

When the latch 82 is released, the potential compression force of the counterbalance springs 58 is released and acts through the hinges 30 to raise the lid 28. The springs exert their maximum force in starting the lifting motion of the lid, but as the springs expend their force and the angularity of the lid changes the leverage and the speed of the lid decreases correspondingly as the lid approaches fully open position. Adjustment to control deceleration of the lid may be made by the spring adjusting rod 62 so that the lid comes to rest with an easy gradual action. Fully open position of the lid is established by the under edges of the lever arms 78 engaging the lower hinge butts 34 as stops.

Within the lid 28 I provide an electric lamp 110, and arrange the lamp to light the interior of the cabinet when the lid is raised. A mercury tilt switch 112 controls the circuit of the lamp 110 and is mounted on a bracket 114 which is secured to the lid panel 38. In the lid panel 38 is an opening which receives a bracket and light reflector 116 that carries a socket 113 for the lamp 110, and attached to the panel 38 over the opening therein is a grille 120. A space 122 free of insulation in the lid is provided to accommodate the reflector 116 and the mercury switch 112, and between the lamp and the casing top, a panel of low heat conducting insulation 124 is provided to compensate for the lack of insulation in the vicinity of the lamp.

With particular reference to Figs. 5 and 6, it will be seen that the lamp reflector 116 has an outturned seating flange 126 which rests on the lid panel 38 around the lamp opening, and in the flange 126 is a plurality of outlets 128 for emission of moisture by diffusion from the lid. Moisture entrained in room air enters the lid because of manufacturing tolerances principally at the latch and hinge mountings and, as is well known, decreases the effectiveness of the insulation. Flow of moisture by diffusion from the lid through outlets 128 is effected by the differential of moisture pressure between the interior of the lid and the cold surfaces of the interior of the storage space. As shown in Fig. 6, the lid panel 38 is provided with a plurality of apertures 130 which register

with the outlets 128 in the reflector flange to establish communication between the interior of the lid and the grille. Cemented to the panel 38 and held against the flange 126 is a pervious material 131 such as fabric to allow passage of moisture laden air from outlets 128 and to retain the insulation 40 within the lid. In order to insure moisture flow from remote points in the lid to the outlets 128, I provide passage forming members 132 in the lid, leading from the front corners of the lid to points adjacent the outlets 128. Preferably screening formed in triangular cross-section is used to form the passages so that moisture may enter the passages at any point along the lengths thereof. In addition, a pair of breather holes 134 is preferably provided in the lid panel 38 to aid in relieving the interior of the lid of moisture laden air for disposal on the cold liner surfaces of the freezer.

From the foregoing description, it will be understood that I have provided for convenient access to the cabinet by arranging for the cabinet lid to be automatically raised upon release of its latch which may be effected by bumping one of its lever arms.

Any suitable refrigerating system may be employed to provide refrigeration for the freezer cabinet. Preferably a coiled refrigerant conduit (not shown) is used to surround the food compartment of the cabinet to freeze the contents of the compartment. This provides for cold wall surfaces in the food compartment immediately below the cabinet lid.

Although only a preferred form of the invention has been illustrated, and that form described in detail, it will be apparent to those skilled in the art that various modifications may be made therein without departing from the spirit of the invention or from the scope of the appended claim.

I claim:

In a refrigerating apparatus having a lid hinged on a cabinet by a hinge having leaves secured to the lid and cabinet, arms formed integral with and extending from the leaf of said hinge secured to said lid, a U-shaped strap having opposite ends pivotally connected to said arms, said strap formed with channel shaped sections in opposed relation, an abutment member extending between and into said channel sections for longitudinal movement therein, a coil spring having one end abutting the web of said U-shaped strap and the other abutting said abutment member, a rotatable rod surrounded by said coil spring having threaded engagement at one end thereof with said abutment member to move the abutment member by rotation of said rod to change the force exerted by said coil spring, a projection formed integrally with and extending from the other leaf of said hinge, apertures in said web and said projection, said rod extending through said apertures and having a head at the lower end thereof for abutment against said projection for holding said rod and abutment member in stationary position for guiding the movement of said strap.

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