Nov. 30, 1948. O. A. LA VALLEE 2,455,182

REFRIGERATOR DRAWER

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FIG. 1.

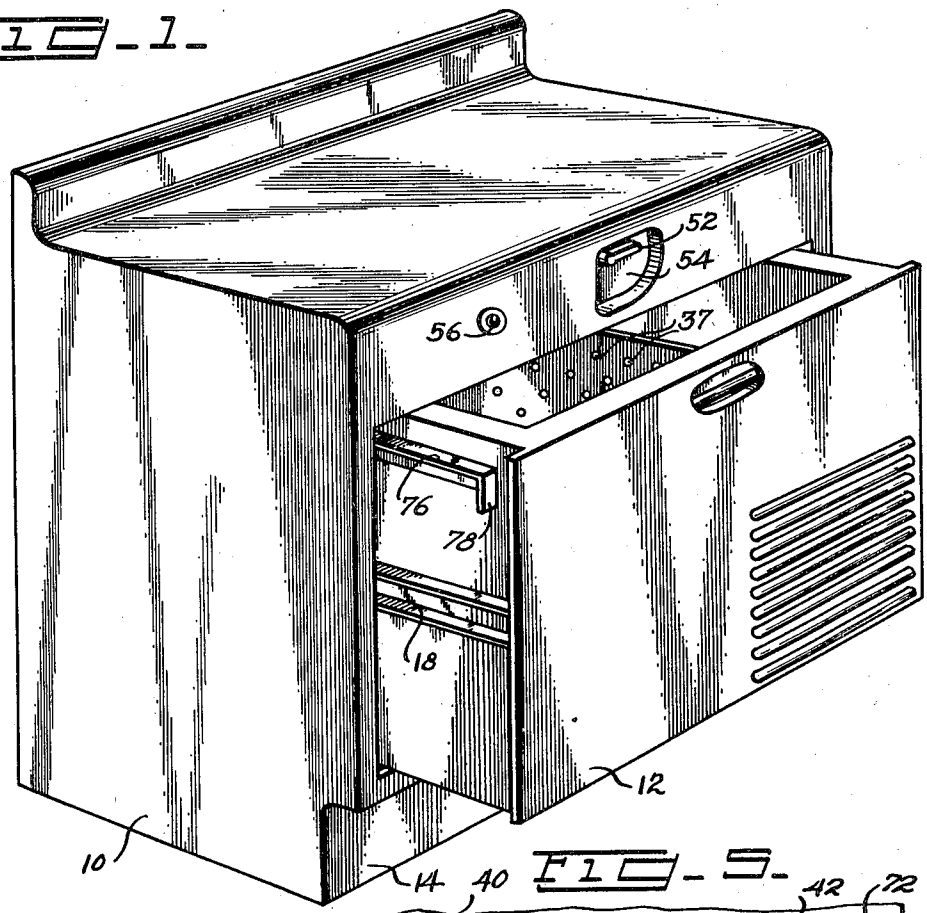


FIG. 5.

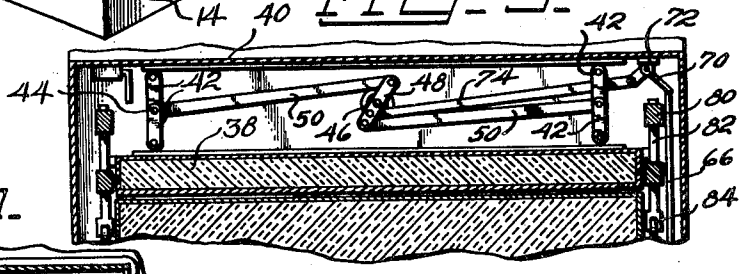
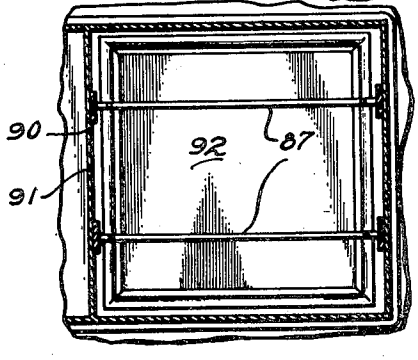


FIG. 9.



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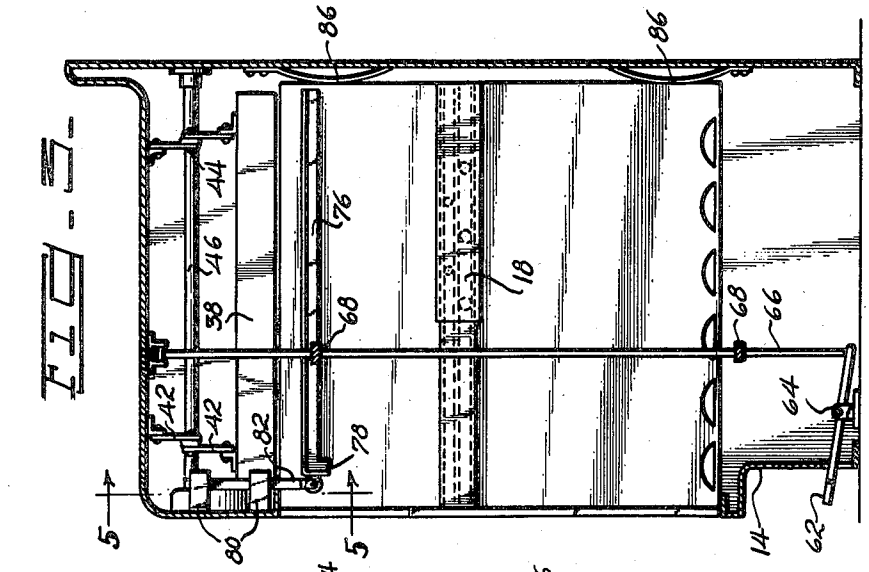
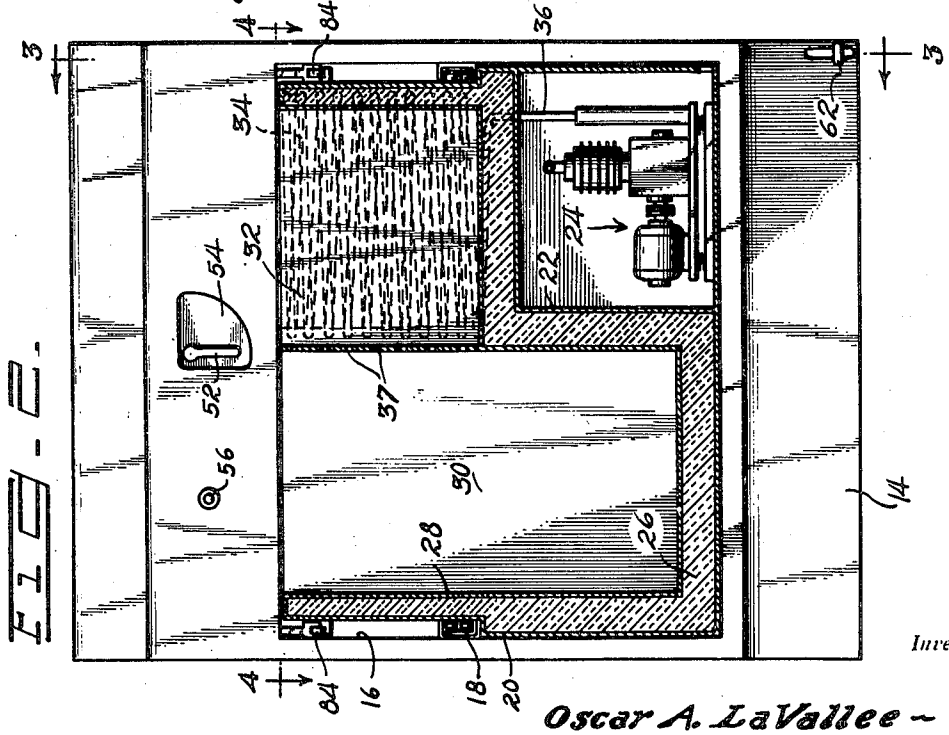


FIG. 2.



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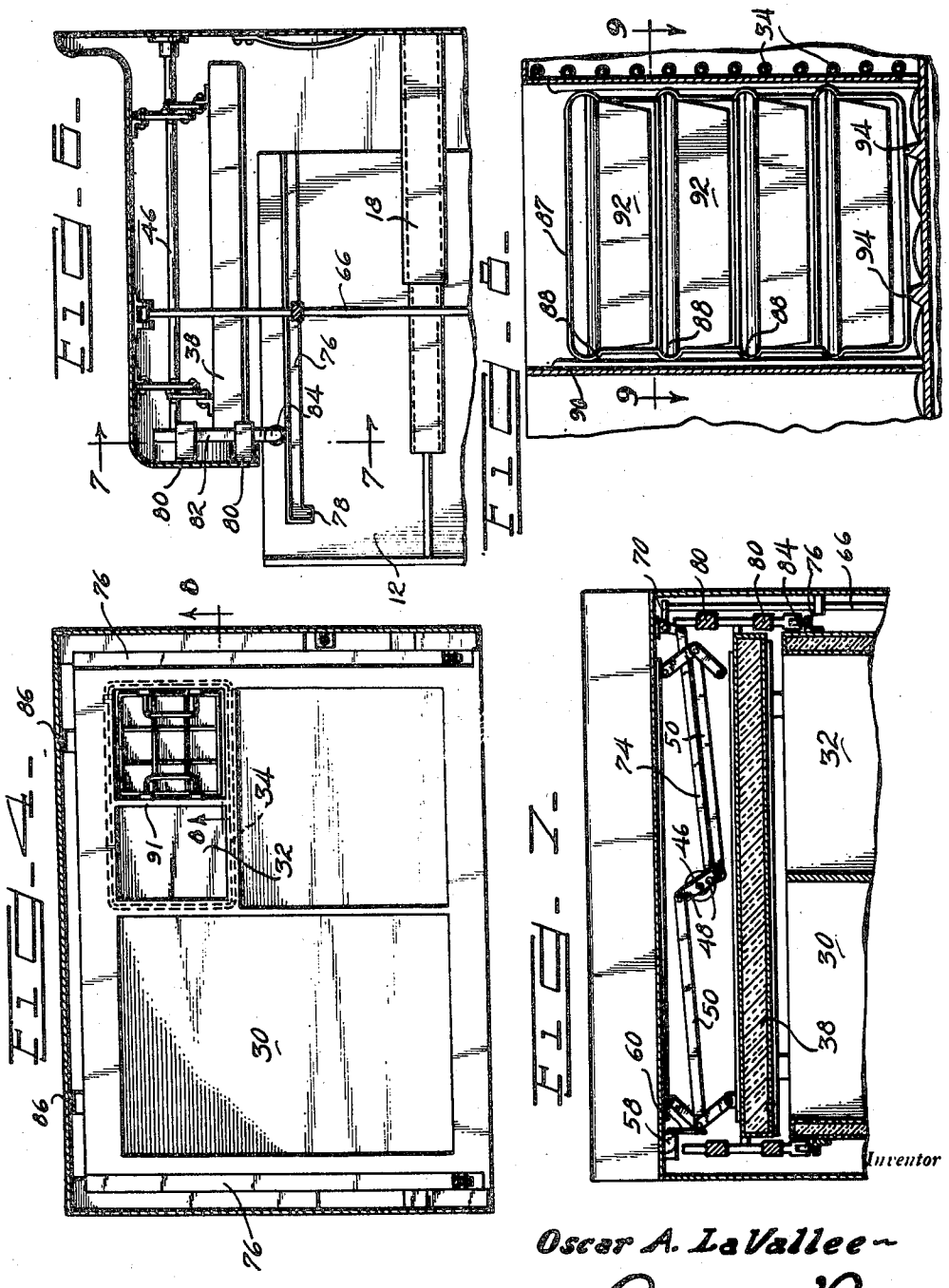
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REFRIGERATOR DRAWER

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2,455,182

UNITED STATES PATENT OFFICE

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REFRIGERATOR DRAWER

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8 Claims. (Cl. 62—116)

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The present invention relates to novel and useful improvements in a refrigerating device and more specifically pertains to a refrigerating and cooling apparatus wherein the storage space and cooling compartments and refrigerating machinery are all disposed in a drawer which is slid laterally from an insulating cabinet.

The principal objects of this invention reside in providing a refrigerating device which is of low over-all height, may be constructed of any suitable shape to fit into the furniture of a kitchen or the like; wherein all of the cooling compartments are contained within a drawer which is slidable laterally from an insulating cabinet; wherein the entire refrigerating system is housed in such a drawer to permit easy accessibility for inspection or repair; wherein a novel and improved insulating and heat sealing means is incorporated into the refrigerator cabinet to permit easy manipulation of the drawer; wherein simultaneous control means are provided for latching or unlatching the slidable drawer and applying or releasing the insulating and sealing closure of the drawer.

These, together with various ancillary objects of the invention, which will later become apparent as the following description proceeds. These ancillary objects envision and include the provision of an insulating and sealing closure for the refrigerator compartments which closure is vertically movable between its open and closed positions together with compact, efficient and dependable mechanism for effecting such movement. The objects set forth are realized by my invention, one embodiment of which has been illustrated by way of example only, in the accompanying drawings, wherein:

Figure 1 is a perspective view of the refrigerating device with the drawer partly open;

Figure 2 is an elevational view of the refrigerator, with the drawer being shown in longitudinal sectional view;

Figure 3 is a transverse vertical sectional view being taken substantially upon the line 3—3 of Figure 2;

Figure 4 is a horizontal sectional view showing the interior of the drawer, and is taken substantially upon the line 4—4 of Figure 2;

Figure 5 is a detail view in transverse vertical section and is taken substantially upon the section line 5—5 of Figure 3;

Figure 6 is a transverse sectional view through the refrigerator and is a view in detail similar to a portion of Figure 3 but showing the open position;

Figure 7 is a vertical sectional detail view being

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taken substantially upon the line 7—7 of Figure 6;

Figure 8 is a detail view in vertical section showing the ice cube trays in the freezing chamber and is taken substantially upon the section line 8—8 of Figure 4; and,

Figure 9 is a horizontal sectional view taken substantially upon the section line 9—9 of Figure 8.

Reference is now made more particularly to the accompanying drawings, wherein like numerals indicate similar parts throughout the several views, and wherein numeral 10 designates a housing or cabinet constituting the outer casing of my improved refrigerator, and which may be formed of any suitable materials and in various preferred shapes, and which receives for lateral sliding movement therefrom a drawer 12. As shown best in Figures 1 and 3, the lower portion of the housing 10 is preferably recessed inwardly as at 14, to provide clearance for purposes which will be apparent. As shown more fully in Figure 2, the housing 10 is provided with a chamber 16 which snugly receives the drawer 12, and which is provided with supporting rails 18 having suitable anti-friction rows and cooperating with the drawer 12 to support the same in an easily movable and guided manner. The drawer is provided preferably with a metallic outer casing 20 and is formed with a chamber 22 at the lower side thereof for the purpose of housing a motor compressor refrigerating unit indicated generally at 24. It will be understood that the refrigerating unit which may be of any desired type, is detachably secured within the compartment 22 and that access thereto for inspection or repairs as necessary may be obtained by suitable openings, not shown.

The casing 20 of the drawer 12 is lined with insulating material 26 in a known manner, and is further provided with an interior lining 28 which may be of metal covered by porcelain or the like, and which interior lining is arranged to provide a storage compartment 30 for receiving chilled food, beverages, frozen produce or the like, and further comprises a freezing compartment 32 which is preferably mounted above the motor compartment 22 and whose insulated walls have embedded therein freezing coils 34 of a known and conventional type and which are connected as at 36 with the refrigerating unit 24. Suitable perforations 37 establish communication between the freezing compartment 32 and the storage compartment 30, to permit circulation of air and the diffusion of cooling air currents therebetween.

In order to completely insulate the chambers

within the drawer 12, and prevent the leakage of heat thereinto, I provide a sealing and insulating means which may be easily applied to and removed from the drawer, when it becomes necessary to obtain access to the latter. For this purpose, a sealing cover of insulating material 38 preferably in the form of a plate of sufficient size to fully cover the top of the drawer, is pivotally and adjustably supported from the top surface 40 of the chamber 16, by means of toggle links 42 pivoted as at 44 intermediate their ends. Figure 5 indicates the position of the mechanism and of the sealing cover 38 when the refrigerator is closed, while Figure 7 indicates their positions when the sealing cover is raised and the refrigerating drawer is open. A control shaft 46 is suitably journaled in the front and rear walls of the housing 10 in any suitable manner, and is provided with crank arms 48 to which are secured connecting links 50 constituting actuating means which are connected to the fulcrums 44 of the toggle links 42, in such manner that rotation of the shaft 46 from the position shown in Figure 5 to that shown in Figure 7 will break the toggle and thereby elevate the sealing cover 38, thus releasing the top surface of the drawer 12 for sliding movement in the casing or housing 10. As shown best in Figure 1, the operating shaft 46 is provided with an operating handle 52 which is preferably oscillatably disposed in a recess 54 in the front of the housing 10 and the signal light 56 is likewise mounted in the front surface thereof for a purpose to be later set forth. Suitable electrical conductors connect the signal light 56 with a control switch 58 mounted within the chamber 16 in a position adjacent to a toggle link pin 44, and the switch is provided with a depending actuating arm 60 so positioned as to be engaged by the pivoted ends of the toggle links 42 when the toggle is broken, as shown in Figure 7. By this means, whenever the actuating mechanism is operated to raise the sealing member 38 the unsealed condition of the drawer will be indicated by the signal light 56.

Attention is now directed to Figure 3 which shows a foot operated means which may be employed as desired, in place of the manual operating means for releasing the sealing engagement of the cover member 38 from the drawer 12. For this purpose, a foot operated lever 62 is suitably mounted upon a fulcrum 64 within the casing 10 and extends through a slot in the front wall of said casing, and is disposed to reciprocate vertically a push rod 66 which is suitably journaled in bearings 68 carried by the frame of the casing 10. At its upper end, as shown best in Figure 5, the push rod 66 engages a bell crank 70 journaled as at 72 upon the upper surface 40 of the casing 16, said bell crank 70 being connected by a link 74 to a crank arm 48 upon the shaft 46. By the foregoing, it will be seen that the crank shaft 46 may be operated either by the manual means 52 or the foot means 62.

Attention is now directed more specifically to Figure 6, and Figure 2, wherein it will be seen that the opposite sides of the drawer 12 are provided with forwardly extending angle iron members 76 constituting supporting ribs upon opposite sides of the drawer, whose upper surfaces constitute roller supporting cam members and provided at their front ends with downwardly extending latch portions 78. Slidably journaled in suitable lugs or brackets 80 secured upon the inner surface of the casing 10 and disposed above the lateral flanges or strip 76, are a pair of support members 82 preferably in the form of rods which are rigidly attached to the sealing cover 38 and whose lower ends carry anti-friction rollers 84 adapted for rolling engagement upon the upper surface of the cam members 76. As will be readily understood, the support rods 82 serve to guide the cover 38 in its vertical movement, and are so positioned that when the roller 84 rides upon the cam member 76, the cover 38 is held in its upward position, while when the roller 84 is disposed beyond the end 78 of the member 76, which position occurs when the drawer is in its closed position as in Figure 3, the latch extension 78 is positioned behind the rollers 84 and the rod 82, whereby the two latter elements constitute a latching means for retaining the drawer in its closed position. As shown best in Figure 3, suitable spring means preferably in the form of resilience steel strips 86 are mounted in any convenient manner upon the back surface of the compartment 16, and pressed against the rear portion of the drawer 12 to yieldingly urge the latter forwardly and out of the casing 10. It will thus be seen that when the cover 38 is raised either by manual operation and handle 52 or foot operation of the pedal 62, the toggle link mechanism elevates the sealing means 38 and with it elevates and retracts the support rod 82 thus disengaging the latching action between the roller 84 and the latch member 78, whereupon the springs 86 urge the drawer forwardly of the housing 10 and the cam surfaces 76 are disposed beneath the roller 84. The opening means whether 52 or 62 may now be released, and the rollers and support rods 84 and 82 rest upon the cam surfaces 76 and prevent lowering of the sealing means 38 until the drawer is again closed, whereupon the latching means 84 will again engage with the latch 78.

Attention is next directed to Figures 8 and 9 which illustrate a suitable form of ice freezing trays which may be disposed in the freezing compartment 32. As shown, a suitable wire frame work 87 is provided which is snugly receivable in the freezing chamber 32 and which is provided with laterally spaced series of semi-circular grooves 88 which are adapted to loosely engage against guide strips 90 formed in an end wall of the compartment 32 and a partition 91 extending vertically therein. A series of ice trays 92 having their upper edges rolled over or beaded are engaged detachably in the semi-circular recesses or seats 88, for support thereby. It will be understood that when the frame work 87 is raised or removed from the freezing compartment, the trays 92 may be removed endwise therefrom. Rubber buttons or the like 94 are provided between the bottom of framework 87 and the bottom of the freezing compartment to prevent one from freezing to the other and to permit the frame to be removed or raised easily.

That portion of the freezing chamber 32 upon the other side of the partition 91 from the ice trays 92 may conveniently be employed as a deep freezing or quick freezing unit for chilling produce or food which it is desired to subsequently store in the compartment 30.

I claim:

1. A refrigerator comprising a housing, a drawer slidable laterally from said housing, a refrigerant liquefying unit housed in a chamber in said drawer, said drawer having an insulating liner in the walls and bottom thereof and partition means defining freezing and food storage compartments, refrigerating coils connected with

said refrigerant liquefying unit and embedded in said insulating liner, a sealing cover of insulating material carried by said housing above said drawer, latch means for retaining said drawer in closed position and means for vertically lowering and elevating said sealing cover for respectively sealing and unsealing said drawer.

2. A refrigerator comprising a housing, a drawer slidable laterally from said housing, a refrigerant liquefying unit housed in a chamber in said drawer, said drawer having an insulating liner in the walls and bottom thereof and partition means defining freezing and food storage compartments, refrigerating coils connected with said refrigerant liquefying unit and embedded in said insulating liner, a sealing cover of insulating material carried by said housing above said drawer, latch means for retaining said drawer in closed position, means for vertically moving said sealing cover for sealing and unsealing said drawer, and cam means carried by said drawer for maintaining said sealing cover in raised position when said drawer is open.

3. A refrigerator comprising a housing, a drawer slidable laterally from said housing, a refrigerant liquefying unit housed in a chamber in said drawer, said drawer having an insulating liner in the walls and bottom thereof and partition means defining freezing and food storage compartments, refrigerating coils connected with said refrigerant liquefying unit and embedded in said insulating liner, a sealing cover of insulating material carried by said housing above said drawer, latch means for retaining said drawer in closed position, means for vertically moving said sealing cover for sealing and unsealing said drawer, cam means carried by said drawer for maintaining said sealing cover in raised position when said drawer is open, support members carried by said sealing means and engageable with said cam means, said support members cooperating with a portion of said cam means to constitute a latch for retaining said drawer in closed position.

4. A refrigerator comprising a housing, a drawer slidable laterally from said housing, a refrigerant liquefying unit housed in a chamber in said drawer, said drawer having an insulating liner in the walls and bottom thereof and partition means defining freezing and food storage compartments, refrigerating coils connected with said refrigerant liquefying unit and embedded in said insulating liner, a sealing cover of insulating material carried by said housing above said drawer, latch means for retaining said drawer in closed position and means for vertically moving said sealing cover for sealing and unsealing said drawer, said last mentioned means including toggle links pivotally supporting said sealing cover above said drawer, and actuating means for operating said toggle links.

5. A refrigerator comprising a housing, a drawer slidable laterally from said housing, a refrigerant liquefying unit housed in a chamber in said drawer, said drawer having an insulating liner in the walls and bottom thereof and partition means defining freezing and food storage compartments, refrigerating coils connected with said refrigerant liquefying unit and embedded in said insulating liner, a sealing cover of insulating material carried by said housing above said drawer, latch means for retaining said drawer in closed position, means for vertically moving said sealing cover for sealing and unsealing said drawer, said last mentioned means including toggle links pivotally supporting said sealing cover above said drawer, actuating means for operating said toggle links, said actuating means including a rotatable crank shaft and connecting rods pivoted to cranks on said crank shaft and to said toggles.

6. A refrigerator comprising a housing, a drawer slidable laterally from said housing, a refrigerant liquefying unit housed in a chamber in said drawer, said drawer having an insulating liner in the walls and bottom thereof and partition means defining freezing and food storage compartments, refrigerating coils connected with said refrigerant liquefying unit and embedded in said insulating liner, a sealing cover of insulating material carried by said housing above said drawer, latch means for retaining said drawer in closed position, means for vertically moving said sealing cover for sealing and unsealing said drawer, said last mentioned means including toggle links pivotally supporting said sealing cover above said drawer, actuating means for operating said toggle links, said actuating means including a rotatable crank shaft, connecting rods pivoted to cranks on said crank shaft and to said toggles, and a foot pedal secured to said housing, and a connecting linkage connecting said pedal to said crank shaft.

7. A refrigerator comprising a housing, a drawer slidable laterally from said housing, a refrigerant liquefying unit housed in a chamber in said drawer, said drawer having an insulating liner in the walls and bottom thereof and partition means defining freezing and food storage compartments, refrigerating coils connected with said refrigerant liquefying unit and embedded in said insulating liner, a sealing cover of insulating material carried by said housing above said drawer, latch means for retaining said drawer in closed position, means for vertically moving said sealing cover for sealing and unsealing said drawer, said last mentioned means including toggle links pivotally supporting said sealing cover above said drawer, actuating means for operating said toggle links, a signal light on said housing and switch means operable by a connecting rod for controlling said signal light in accordance with the position of said toggle mechanism.

8. A refrigerator comprising a housing, a drawer slidable laterally from said housing, a refrigerant liquefying unit housed in a chamber in said drawer, said drawer having an insulating liner in the walls and bottom thereof and partition means defining freezing and food storage compartments, refrigerating coils connected with said refrigerant liquefying unit and embedded in said insulating liner, a sealing cover of insulating material carried by said housing above said drawer, latch means for retaining said drawer in closed position, means for vertically moving said sealing cover for sealing and unsealing said drawer, said last mentioned means simultaneously raising said sealing cover and disengaging said latch means.

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