June 23, 1942. R. E. KING 2,287,622

REFRIGERATOR CABINET

Filed Aug. 27, 1940

Fig. 1.

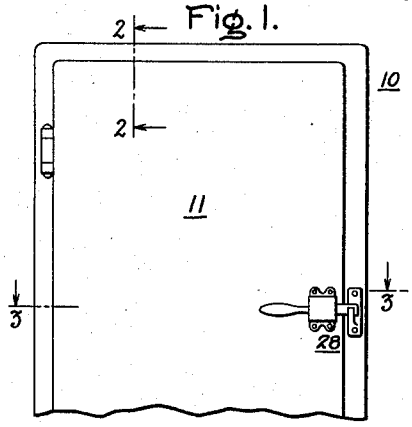


Fig. 2.

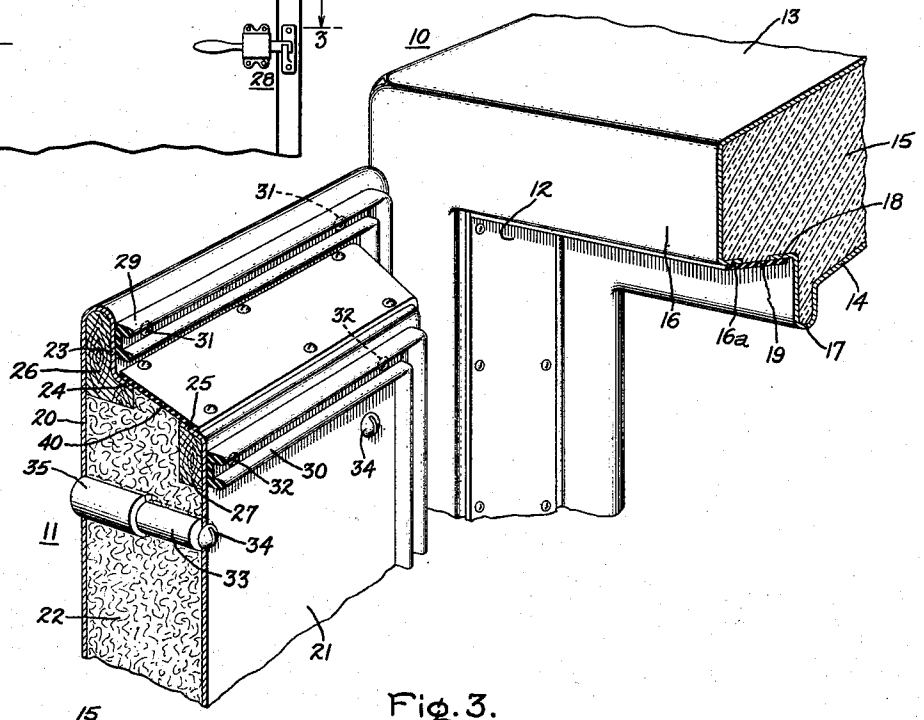
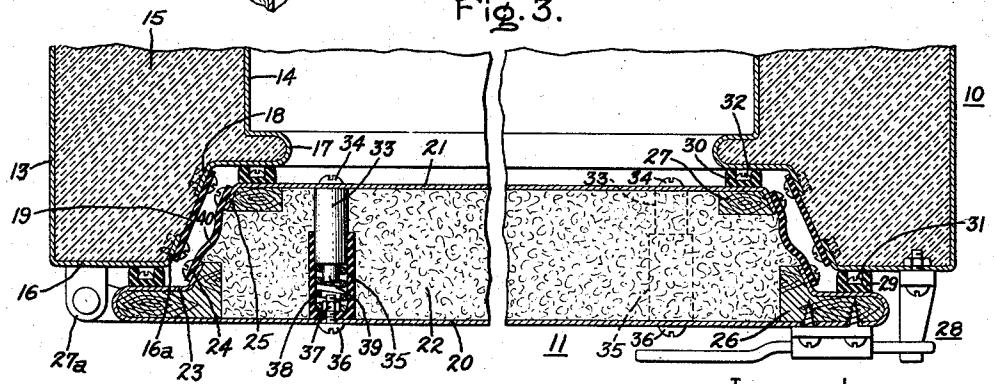


Fig. 3.



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REFIGERATOR CABINET

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4 Claims. (Cl. 20—35)

My invention relates to refrigerator cabinets and more particularly to a door construction for such cabinets.

At the present time attention is being directed to the improvement of refrigerator cabinets designed for relatively low temperatures as, for example, the storage of frozen foods, and farm freezers. Most cabinets designed for such use have had the doors permitting access to the storage compartment located in the top of the cabinet. One of the reasons why the cabinet having vertical doors for low temperature storage has not been used is because of the difficulty of sealing the space between the door and the door opening. Attempts to seal the door by means of a single gasket have not been practical because the gasket path is too short to prevent frosting inside the door adjacent to the gasket. Attempts have been made hitherto to seal the door opening with a double gasket but such arrangements have been short lived since either the inner or the outer gasket tends to take the compression load of the door latch after a few compressions of the gaskets, resulting in an arrangement which is no more effective than a single gasket.

Accordingly, it is an object of my invention to provide a new and improved sealing arrangement for a refrigerator cabinet which is particularly adapted, but not limited, to use in a refrigerator having vertically positioned doors.

It is another object of my invention to provide a new and improved double seal for refrigerator doors.

Further objects and advantages of my invention will become apparent as the following description proceeds and the features of novelty which characterize my invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

For a better understanding of my invention, reference may be had to the accompanying drawing in which Fig. 1 is a partial front elevational view of a refrigerator provided with a door embodying the principles of my invention; Fig. 2 is an enlarged perspective partial view of the cabinet shown in Fig. 1 taken along the line 2—2 of Fig. 1; and Fig. 3 is a horizontal sectional view, partly broken away, of the refrigerator cabinet shown in Fig. 1 taken along the line 3—3 of Fig. 1.

Referring to the drawing, a refrigerator cabinet 10 having thermally insulated walls is provided with a suitably hinged door 11 for closing the opening 12 to a food storage compartment. The storage compartment is cooled by any suitable refrigerating device, not illustrated.

The cabinet walls comprise an outer wall or casing 13 and an inner wall or lining 14 having suitable heat insulation 15 disposed therebetween. The outer casing or shell 13 is provided with inwardly directed flanges 16 and 16a. The inner casing 14 is provided with an inwardly extending loop, as indicated by the numeral 17, and a flange 18, the flanges 16a and 18 being oppositely directed and lying in the same plane.

In order to reduce the conduction of heat into the cabinet, the inner and outer casings are joined by a breaker strip 19 secured in place in any suitable manner, as by means of screws for example. The breaker strips 19 are preferably formed from a non-metallic, non-hygroscopic material, such as one of the resinous products known under the trade names Bakelite, Textolite, etc.

The door 11 comprises an outer metallic wall or portion 20 and an inner metallic wall or portion 21 with suitable heat insulation 22 disposed therebetween. The outer portion is provided with an inwardly directed flange 23 having a laterally extending portion 24. The inner portion 21 is provided with a laterally directed flange 25 arranged in the same plane as portion 24 and lying oppositely disposed with respect thereto. The door 11 may be reinforced by frame members 26 and 27 of suitable material as wood, for example. The door is swingably supported from the cabinet by means of a suitable hinge 27a and is provided with a latch, generally indicated by the numeral 28, for maintaining the door in the closed position thereof. In order to simplify the drawing a simple type of latch has been illustrated but it will be understood that any desired form of latch may be employed.

In order to provide an effective seal for a refrigerator cabinet of the type described, I have provided a pair of sealing members 29 and 30, the outer seal 29 being associated with the outer portion 20 of the door and engaging the flange 16 at the door opening. In the illustrative form of my invention, screws 31 are utilized to retain the sealing member 29 in any suitable location, as on the flange 23 although any suitable fastening means may be provided. It will also be understood that any desired shape of gasket may be employed.

The inner or second sealing member 30 is suitably secured as by means of screws 32 extending through apertures in the inner portion 21 into the frame member 27 for engaging the loop por-

tion 17 of the inner liner 14. Thus, I have provided a multiple seal in which the outer member 29 engages the outer liner on one side, that is the outer side, of the breaker strip, whereas the inner or second seal 30 is arranged to provide a seal on the other side, or inside, of the breaker strip 19.

The inner portion 21 of the door is resiliently supported from the outer portion 20 in order that the inner seal 30 may be urged into sealing engagement by means which is, to some extent, independent of the door latching means. In the form of my invention illustrated in the drawing there is provided a guide 33 suitably secured to the inner portion of the door as by means of a bolt 34 extending through a suitable aperture in the portion or liner 21 into a suitable threaded recess in the guide 33. A sleeve 35 suitably secured to the outer portion or liner 20 as by means of a bolt 36 and nut 37 is provided to receive the guide 33 in telescopic relationship. In order to urge apart or bias the inner and outer portions of the door in opposite directions, there is provided resilient means, illustrated in the form of a spring 38, within the sleeve 35 disposed between the guide member 33 and the outer or closed end of the sleeve 35. The reduced end 39 of the guide member 33 is provided as a guide for the spring 38. In order to minimize the transfer of heat between the inner and outer portions of the door, guide members 33 and sleeve 35 are preferably formed of a material which has relatively poor heat conductivity characteristics. A suitable material for this purpose is that already described for use as the breaker strip 19.

In order to accommodate limited relative movement between the inner and outer portions, I have provided a breaker strip 40 preferably formed from a flexible, thermally-resistant, material, as rubber, for example, for closing the opening between the inner and outer portions 20 and 21. The breaker strip 40 is suitably secured to the inner and outer portions as by means of screws extending through suitable apertures in the metallic liner into the wooden frame members 26 and 27.

The parts of the door are so arranged and constructed that when the door is closed the inner gasket or sealing member 30 first makes contact. As the door is brought into its latching position, the outer gasket or sealing member 29 is forced against the flange 14. Because of the resilient means urging apart the inner and outer portions of the door, the inner gasket 30 is forced tightly against the flange 18 of the inner wall or lining 14 of the cabinet. Thus, I have provided a door assembly having an inner portion yieldingly and resiliently mounted on an outer portion in such a way as to have limited movement toward and away from the outer portion, an arrangement which permits the maintenance of a continuous, yielding, uniform sealing pressure between the inner sealing member or gasket and the portion of the cabinet defining the door opening. Moreover, I have provided a refrigerator cabinet having a double seal or gasket arrangement so constructed and arranged that both sealing members will take load even though one of the gaskets has been compressed or deformed from the original dimensions.

While I have shown a particular embodiment of my invention, I do not desire my invention to be limited to the particular construction shown and described and I intend in the appended claims to cover all modifications within the spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In a thermally insulated refrigerator cabinet having a door opening, a door for closing said opening, means for maintaining said door in the closed position thereof, said door comprising an inner portion and an outer portion, sealing means carried by each of said portions for sealing the space between said door and the walls of said cabinet, a breaker strip of thermally resistant and flexible material closing the opening between said portions, and means extending between said door portions and constructed and arranged for urging apart said portions.

2. In a thermally insulated cabinet of the type having inner and outer liners with thermal insulation disposed therebetween and having the opening between said liners closed by a thermally resistant breaker strip, and a door opening, a door for closing said opening and comprising an inner and an outer portion, means for maintaining said door in the closed position thereof, a pair of sealing members carried by said door for sealing the space between said door and the walls of said cabinet, one of said sealing members being associated with said outer portion and arranged for sealing said door opening on the outside of said breaker strip, the other of said sealing members being associated with the inner portion of said door and arranged for sealing said door opening on the inside of said breaker strip, and means for supporting said inner portion from said outer portion, said means being so constructed and arranged as to urge apart said portions, and a thermally resistant breaker strip closing the opening between said portions, said breaker strip also being flexible for accommodating limited relative movement between said portions.

3. In a thermally insulated cabinet of the type having inner and outer linings with thermal insulation disposed therebetween and having the opening between said liners closed by a thermally resistant breaker strip, and a door opening, a door for closing said opening, means for maintaining said door in its closed position, a pair of sealing members for sealing the space between said door opening and the walls of said cabinet, one of said sealing members being associated with the outer portion of said door and arranged to seal said door opening on the outside of said breaker strip, the other of said sealing members being associated with the inner portion of said door and arranged to seal said opening on the inside of said strip, and means for supporting said inner portion from the outer portion, said means including a guide member of relatively poor heat conductivity and carried by one of said portions, a sleeve of relatively poor heat conducting material carried by the other of said portions and arranged to receive said guide member, resilient means for urging apart said guide member and said sleeve, and a flexible breaker strip closing the opening between said inner and said outer portions.

4. In a thermally insulated cabinet of the type having inner and outer linings with thermal insulation disposed therebetween and having the opening between said liners closed by a thermally resistant breaker strip, a door opening, a door for closing said opening, a pair of sealing members for sealing the space between said door and the walls of said cabinet, means for maintaining

said door in its closed position, one of said sealing members being associated with the outer portion of said door and arranged to seal said door opening on the outside of said breaker strip, the other of said sealing members being associated with the inner portion of said door and arranged to seal said opening on the inside of said strip, and means for supporting said inner portion from the outer portion, said means including a guide member of relatively poor heat conductivity and carried by one of said portions, a sleeve of relatively poor heat conducting material carried by the other of said portions and arranged to receive said guide member and resilient means for urging apart said guide member and said sleeve, and a flexible breaker strip closing the opening between said inner and said outer portions, said maintaining means serving to maintain one of said sealing members in sealing engagement and said resilient means serving to maintain the other of said sealing means in its sealing position when said door is closed.

RALPH E. KING.