

July 18, 1939.

H. D. WHITE

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REFRIGERATOR CABINET CONSTRUCTION

Filed Aug. 6, 1936

2 Sheets-Sheet 1

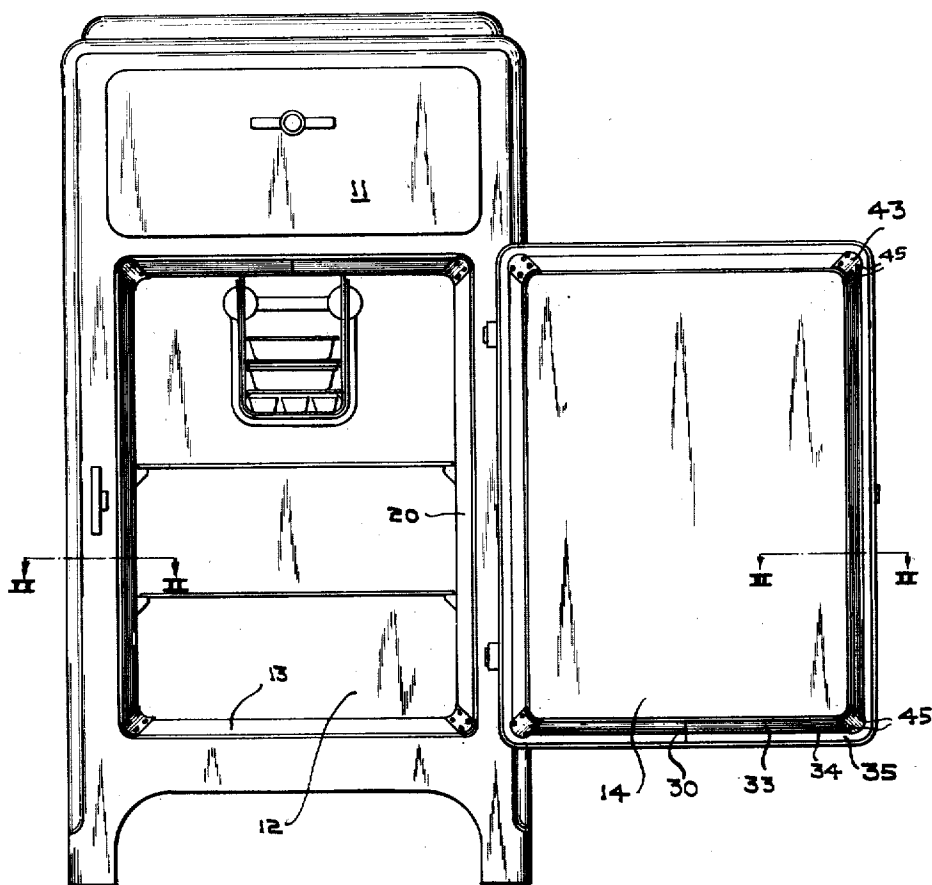


FIG. 1.

WITNESSES:

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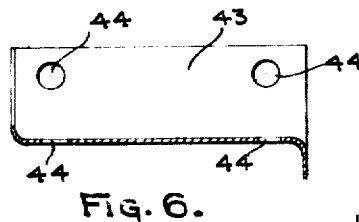
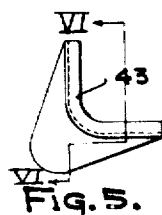
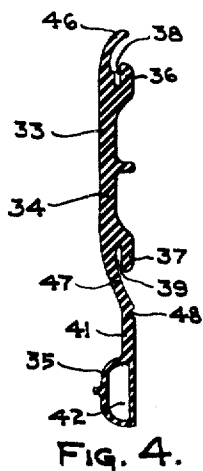
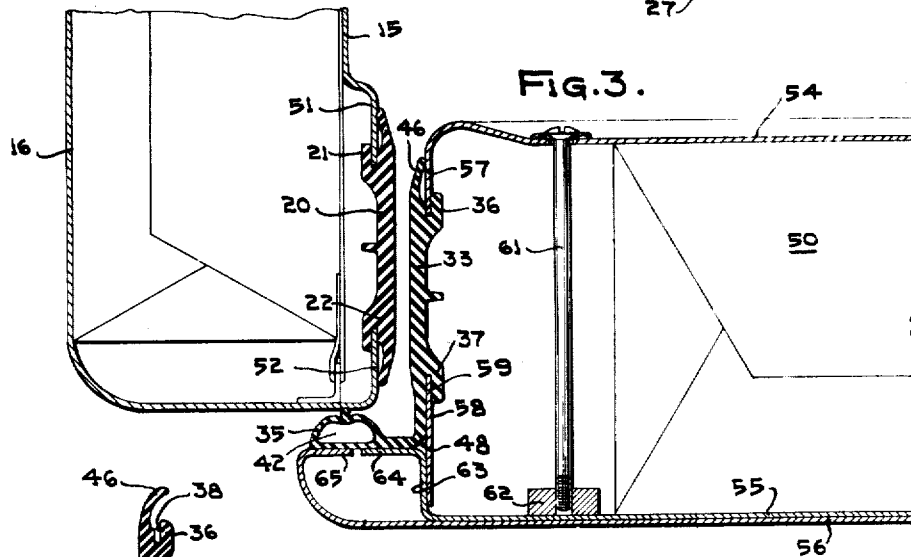
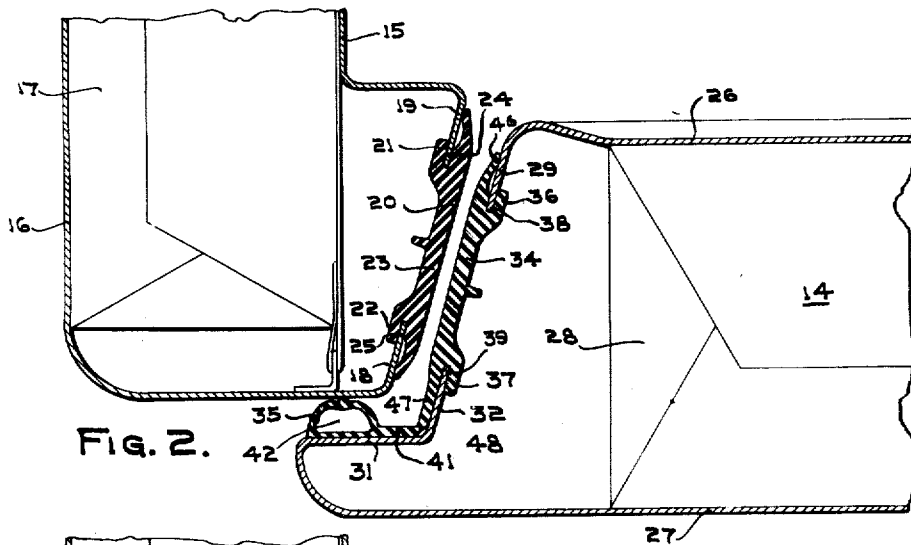
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**2,166,629**

## REFRIGERATOR CABINET CONSTRUCTION

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2 Sheets-Sheet 2



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2,166,629

## REFRIGERATOR CABINET CONSTRUCTION

Howard D. White, Springfield, Mass., assignor to Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., a corporation of Pennsylvania

Application August 6, 1936, Serial No. 94,550

11 Claims. (Cl. 20—35)

My invention relates to a refrigerator cabinet construction and particularly to a combined insulating member and sealing gasket for use with a refrigerator cabinet closure.

5 It is an object of my invention to provide a combined heat insulating member and sealing gasket for a refrigerator cabinet which is formed in one piece from resilient material such as rubber.

10 It is another object of my invention to provide a combined breaker strip and sealing gasket for a refrigerator cabinet in which the breaker strip serves as a wall member between inner and outer metal walls and the gasket provides an air-tight seal between the inside and outside of the refrigerator.

15 It is still a further object of my invention to provide a combined breaker strip and sealing gasket in which the breaker strip is provided with tongue portions which form opposed grooves into which registering edges of inner and outer cabinet walls extend, with the tongue portions engaging the edges, and which is held in place by the aforesaid tongue portions and by suitable means for retaining the inner and outer wall members of the cabinet construction in fixed relative position.

20 It is another object of my invention to provide a cabinet construction in which there is no hygroscopic frame to which the breaker strips are attached and in which non-hygroscopic breaker strips disposed peripherally of the door opening and the door provide a heat insulating connection between the inner and outer metal walls thereof, and in which a sealing gasket is formed integrally with one of the breaker strips and provides an air-tight seal between the inside and the outside of the cabinet.

25 These and other objects are effected by my invention, as will be apparent from the following description and claims taken in connection with the accompanying drawings forming a part of this application, in which:

30 Fig. 1 is a front view of a refrigerator cabinet embodying my invention;

35 Fig. 2 is a view taken on lines II—II of Fig. 1 showing a portion of a door and cabinet with the door in the closed position and embodying a combined breaker strip and gasket as contemplated by one embodiment of my invention;

40 Fig. 3 is a view similar to that shown in Fig. 2, and illustrates a second embodiment of my invention;

45 Fig. 4 is a cross-section of my combined breaker

strip and sealing gasket prior to its assembly on the door;

Fig. 5 is an end view of a corner clip used with the door structure shown in Fig. 2; and

Fig. 6 is a sectional view of the corner clip 5 shown taken on the line VI—VI of Fig. 5.

Referring to the drawings for a detailed description of the first embodiment of my invention, as shown in Figs. 1, 2, and 4, the numeral 11 indicates a refrigerator cabinet provided with a refrigerator food storage compartment 12 having an access opening 13 closed by a door 14. The cabinet, shown partly in section in Fig. 2, includes an inner metal shell 15 and an outer metal shell 16 with heat insulating material 17 therebetween. 10

The outer metal shell 16 includes inwardly projecting edge portions 18 extending around the access opening 13. The inner metal shell 15 has outwardly projecting edge portions 19 aligned with and spaced from edge portions 18. As shown in Fig. 2, a heat insulating, flexible breaker strip 20, preferably formed of extruded rubber, is disposed between the edge portions 18 and 19 and provides a closure for the space therebetween. 25 The breaker strip 20 is provided with tongue portions 21 and 22 arranged, at opposite marginal edges thereof and with a flat body portion 23. The tongues 21 and 22 define grooves 24 and 25, respectively, therebetween. 30

The assembly of the inner metal shell 15, the outer metal shell 16, and the breaker strip 20 is fully described in the copending application of Gregg F. Forsthoefel, Serial No. 32,369, filed July 20, 1935 for Cabinet construction and assigned to the Westinghouse Electric & Manufacturing Company, and no further description of the construction of the cabinet is deemed necessary in this application. 35

The door construction shown partly in section in Fig. 2 includes an inner metal door pan 26 and an outer metal door pan 27 with heat insulating material 28 disposed therebetween. The inner metal door pan 26 is provided with an outwardly extending edge portion 29. The outer metal door pan 27 overlaps the edge of the cabinet 11 at the door opening, being bent back upon itself so as to form a flange 31, and the metal of the flange 31 is then bent inwardly to form an edge portion 32 aligned with and spaced from the edge portion 29 of the inner door pan 26. 40

As shown in Figs. 2 and 4, a combined heat insulating breaker strip and sealing gasket 33 made of a flexible material, such as, for example, relatively soft rubber, which may be economically ex- 45

truded into strips of any desired length and shape, is applied to the door 14. The combined breaker strip and gasket seal comprises a flat body portion 34 and a gasket portion 35. The flat body portion 34 is provided with tongues 36 and 37 disposed at the opposite longitudinal edges thereof. The tongues 36 and 37 form with the flat body portion 34, grooves 38 and 39, respectively. The sealing gasket portion 35 is formed integral with the flat body portion 34 and is connected thereto by a thin section 41 which allows the gasket sealing portion 35 to be easily flexed with respect to the breaker strip portion 34. The gasket embodies a semi-cylindrical hollow tube 42 which is deformed as shown in Fig. 2 when the door is closed to provide an air tight seal between the inside and outside of the refrigerator.

A hygroscopic material has sometimes been used as a backing for the breaker strip. In some cases, screws are used to attach the breaker strip to the hygroscopic material and to position the hygroscopic material properly between the inner and outer walls of the closure. In the cabinet construction embodying my invention, the use of hygroscopic material and screws is not necessary since the breaker strip portion 34 is held in position solely by the coaction of the metal wall members. Thus, by the elimination of the screws and hygroscopic material from my cabinet construction, the possibility of moisture affecting the heat insulating material and thereby reducing its heat insulating value is minimized.

The combined breaker strip and sealing gasket 33 may be formed of one or more pieces but I prefer to form it in a single length, coextensive with the perimeter of the door 14, the ends of which are brought together in abutting relation as shown at 30 in Fig. 1.

In the embodiment shown in Figs. 1 and 2, the inner and outer door pans 26 and 27 are held in fixed relative position by corner clips 43 which may be made of metal and which are shown in detail in Figs. 5 and 6. The corner clips 43 are L-shaped and are provided with four apertures 44. Screws 45 pass through the apertures 44, and enter the inner and outer door pans 26 and 27, thus holding them in fixed relative position at the corners. When the combined breaker strip and gasket is assembled on the door 14, the edge portions 29 and 32 of the inner and outer door pans 26 and 27 enter the grooves 38 and 39, respectively, formed by the tongues 36 and 37. As will be apparent from Figs. 2 and 4, the longitudinal extremities or tongues 46 and 47 of the flat body portion 34 of the breaker strip 33 are formed with a bias toward the tongues 36 and 37. When the edge portions 29 and 32 are engaged in the grooves 38 and 39, this bias will cause a gripping action between tongues 46 and 36 and between tongues 47 and 37, thus holding the breaker strip in position. Although such gripping action is preferred, it is not necessary to the practice of the invention.

In a construction as shown in Figs. 1 and 2 where the breaker strip is formed in one piece and is inclined with respect to the door pans, and is not at right angles with respect thereto, as shown in Fig. 3, the breaker strip must be partially slit at the corners so that it will not bulge. The corner clips 43, therefore, perform the additional function of covering the slits at the corners of the breaker strip.

As the combined breaker strip and sealing gasket is relatively soft and flexible, it may be easily

flexed to conform with the flange 31 of the door 14 as shown in Fig. 2. A notch 48 is provided between the portions 41 and 47 of the combined breaker strip and gasket 33 to facilitate bending of the gasket portion 35 out of alignment with the breaker strip portion 34.

Referring now to the drawings for a detailed description of the second embodiment of my invention as shown in Figs. 3 and 4, the cabinet construction in this embodiment is identical with that shown in the first embodiment with the exception that flanges 51 and 52 are bent at right angles to the inner and outer wall members 15 and 16, and the breaker strip 20 is held therebetween.

As shown in Fig. 3, the door construction 50 in this embodiment comprises an inner door pan 54 and a sub-frame 55, upon which an outer door pan 56 is suspended. The inner door pan 54 is provided with an edge portion 57 bent at right angles thereto, and the sub-frame 55 has attached thereto a ring-like member 58 which forms another edge portion 59 in the same plane as and spaced from the edge portion 57. The edge portions are retained in fixed relative positions by a screw 61 extending between the inner door pan 54 and the sub-frame 55, interiorly of the door 50, a tapped block 62 being welded to the sub-frame 55 to receive the threaded end of the screw 61.

The sub-frame 55 is provided with an intumed flange 63 and also a flange 64 extending parallel to the sub-frame 55. The outer door pan 56 is provided with a portion 65 bent upon itself and spaced from and aligned with the flange 64 on the sub-frame 55, the bent portion 65 overlapping the door opening peripherally thereof.

The combined breaker strip and gasket 33 is attached to the edge portions 57 and 59 in the same manner as shown in Fig. 2, except that the breaker strip is disposed at right angles to the inner and outer door pans, and corner clips are not necessarily used for this reason. The gasket portion 35 of the combined breaker strip and gasket 33 is bent at right angles to the breaker strip portion 34 at the notch 48 and the gasket 35 closes the space between the flange 64 of the sub-frame 55 and the bent portion 65 of the outer door pan 56. The hollow tube 42 of the gasket 35 is disposed between the front of the outer cabinet shell 16 peripherally of the door opening, and the overlapping portion 65 of the door and is deformed when the door 50 is closed, thus providing an air-tight seal between the inside and outside of the cabinet.

It will be apparent from the foregoing that, by my invention, I have provided a combined breaker strip and sealing gasket for a refrigerator cabinet which is made from a non-hygroscopic flexible material and which is held in position by engagement of flexible tongues provided thereon, thereby making it unnecessary to use a hygroscopic backing material and screws to fasten the combined breaker strip and sealing gasket in position.

While I have shown my invention in several forms, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various other changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are imposed by the prior art or as are specifically set forth in the appended claims.

What I claim is:

1. The combination of a cabinet and door con-

struction embodying members having spaced edges extending toward each other, and a combined breaker strip and door gasket of non-hygroscopic material which comprises a substantially flat wall portion and an integral gasket sealing portion, and laterally extending tongues provided at opposite longitudinal edges of said flat wall portion and forming outwardly opening grooves for receiving said spaced edges, said tongues adapted to engage said edges, said flat portion providing a closure for the space between said edges, and said gasket sealing portion providing a seal between the door and the cabinet at the door opening.

2. The combination of a cabinet construction embodying a door having members provided with edge portions extending toward and spaced from each other peripherally of said door, and a combined breaker strip and door gasket formed of non-hygroscopic flexible material which comprises a substantially flat wall portion and an integral gasket sealing portion, and laterally extending tongues provided at opposite longitudinal edges of said flat wall portion and forming outwardly opening grooves for receiving said spaced edges, said tongues adapted to engage said edges to hold the combined breaker strip and door gasket in position, said flat portion providing a closure for the space between said edges, and said gasket sealing portion providing a seal between the door and the cabinet at the door opening.

3. The combination of a cabinet, a door for the cabinet having members extending at an angle to the face of the door, said members being spaced from each other, said door also embodying a flange portion overlapping said cabinet peripherally of the door and extending outwardly in the same direction as the face of the door, and a combined breaker strip and door gasket formed of a flexible non-hygroscopic material which comprises a substantially flat wall portion, an integral gasket sealing portion and laterally extending tongues provided at opposite longitudinal edges of said flat wall portion and forming outwardly opening grooves for receiving said spaced edges, said tongues adapted to engage said edges to hold the combined breaker strip and door gasket in position, said flat portion providing a closure for the space between said edges, and said gasket sealing portion providing a seal between the door and the cabinet at the door opening and being bent at an angle to said flat wall portion and conforming with said overlapping flange.

4. A refrigerator cabinet having a door comprising an inner wall having an outwardly extending edge portion, an outer wall spaced from said inner wall and having an inwardly extending edge portion spaced from and aligned with the edge portion of said inner wall, heat insulation between the walls, another wall formed of flexible material provided with laterally extending tongues which form opposite outwardly extending grooves to engage said edge portions, said latter wall forming a closure for the space between said inner and outer walls, and a gasket seal flexibly connected to said wall of flexible material to provide an air-tight seal between the inside and outside of the cabinet.

5. A refrigerator cabinet construction embodying an access opening and a door for closing the access opening, said door comprising an inner metal pan and an outer metal shell, said inner pan having an outwardly extending flange dis-

posed peripherally of the door, said outer shell also having a flange disposed peripherally of the door and extending toward said first flange, said door being formed to overlap the cabinet peripherally of the access opening, a non-hygroscopic connection between the inner pan and outer shell for retaining them in fixed relation with the edges of the respective flanges in spaced relation with each other, a breaker strip of heat insulating non-hygroscopic material for connecting the flanges, said breaker strip embodying tongue members on opposite lateral edges thereof which form inwardly opening grooves for engaging the respective flanges and retaining the breaker strip in fixed position, and a gasket member formed integrally with the breaker strip and cooperating with the overlapping portion of the door and the cabinet to provide a seal between the inside and outside of the cabinet.

6. A refrigerator cabinet construction embodying an access opening and a door for closing the access opening, said door comprising an inner metal pan and an outer metal shell, said inner pan having an outwardly-extending flange disposed peripherally of the door, said outer shell also having a flange disposed peripherally of the door and extending toward said first flange, a non-hygroscopic connection between the inner pan and outer shell for retaining them in fixed relation with the edges of the respective flanges in spaced relation with each other, a breaker strip of heat insulating non-hygroscopic material for connecting said flanges, said breaker strip embodying tongue members on opposite marginal edges thereof to form inwardly opening grooves for engaging the respective flanges and retaining the breaker strip in fixed position, and a gasket member formed integrally with the breaker strip and cooperating with the door and the cabinet to provide a seal between the inside and the outside of the cabinet.

7. A refrigerator cabinet having a door comprising an inner metallic wall, a metallic door frame, a ring-like member attached to said door frame and extending peripherally of the door, an outer metallic wall supported by said door frame, said inner metallic wall and said metallic door frame being spaced from each other and having heat insulation therebetween, and a flexible heat insulating member embodying a wall portion extending between said inner wall and said ring-like member to form a closure for the space therebetween and a gasket seal formed integrally with said heat insulating member to provide an air-tight seal between the inside and outside of the refrigerator.

8. A combined breaker strip and gasket seal formed of non-hygroscopic material comprising a substantially flat wall portion provided with laterally-extending tongues which form outwardly-extending grooves and a sealing portion formed integrally with said flat portion and extending from one of the lateral extremities thereof.

9. An article of manufacture comprising a combined breaker strip and a hollow sealing member formed of a flexible non-hygroscopic material, said hollow sealing member being connected with said breaker strip at one of the lateral extremities thereof, said breaker strip having laterally extending tongues which form outwardly extending grooves disposed on the same side of said breaker strip, said hollow sealing portion being disposed on the opposite side of said breaker strip from said grooves.

10. A refrigerator cabinet provided with a door

comprising an inner wall having an edge portion, an outer wall spaced from said inner wall and also having an edge portion, heat insulation between the walls, another wall formed of flexible material provided with tongues which form grooves to engage said edge portions, said latter wall forming a closure for the space between said inner and outer walls, and a gasket seal flexibly connected to said wall of flexible material to provide an air-tight seal between the inside and the outside of the cabinet.

11. A refrigerator cabinet having a storage chamber therein provided with a door for closing the chamber, said door comprising an inner wall having an edge portion, an outer wall spaced

from said inner wall and also having an edge portion, heat insulation between the walls, a breaker strip forming another exposed wall member and providing a closure for the space between said inner and outer walls, said breaker strip being provided with at least one flexible tongue near an edge thereof in which a groove is formed to engage the edge portion of one of said walls, means for fastening the other edge of the breaker strip to the other wall, and a gasket seal flexibly and integrally connected to said breaker strip to provide an air-tight seal for said storage chamber when the door is closed.

HOWARD D. WHITE. 15

### DISCLAIMER

2,166,629.—*Howard D. White*, Springfield, Mass. REFRIGERATOR CABINET CONSTRUCTION. Patent dated July 18, 1939. Disclaimer filed January 12, 1940, by the inventor; the assignee, *Westinghouse Electric & Manufacturing Company*, consenting.

Hereby disclaims claims 10 and 11 of the above patent.  
[*Official Gazette February 6, 1940.*]

comprising an inner wall having an edge portion, an outer wall spaced from said inner wall and also having an edge portion, heat insulation between the walls, another wall formed of flexible material provided with tongues which form grooves to engage said edge portions, said latter wall forming a closure for the space between said inner and outer walls, and a gasket seal flexibly connected to said wall of flexible material to provide an air-tight seal between the inside and the outside of the cabinet.

11. A refrigerator cabinet having a storage chamber therein provided with a door for closing the chamber, said door comprising an inner wall having an edge portion, an outer wall spaced

from said inner wall and also having an edge portion, heat insulation between the walls, a breaker strip forming another exposed wall member and providing a closure for the space between said inner and outer walls, said breaker strip being provided with at least one flexible tongue near an edge thereof in which a groove is formed to engage the edge portion of one of said walls, means for fastening the other edge of the breaker strip to the other wall, and a gasket seal flexibly and integrally connected to said breaker strip to provide an air-tight seal for said storage chamber when the door is closed.

HOWARD D. WHITE. 15

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