June 15, 1937. J. L. KNIGHT 2,084,204

REFRIGERATOR CABINET

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Fig. 1.

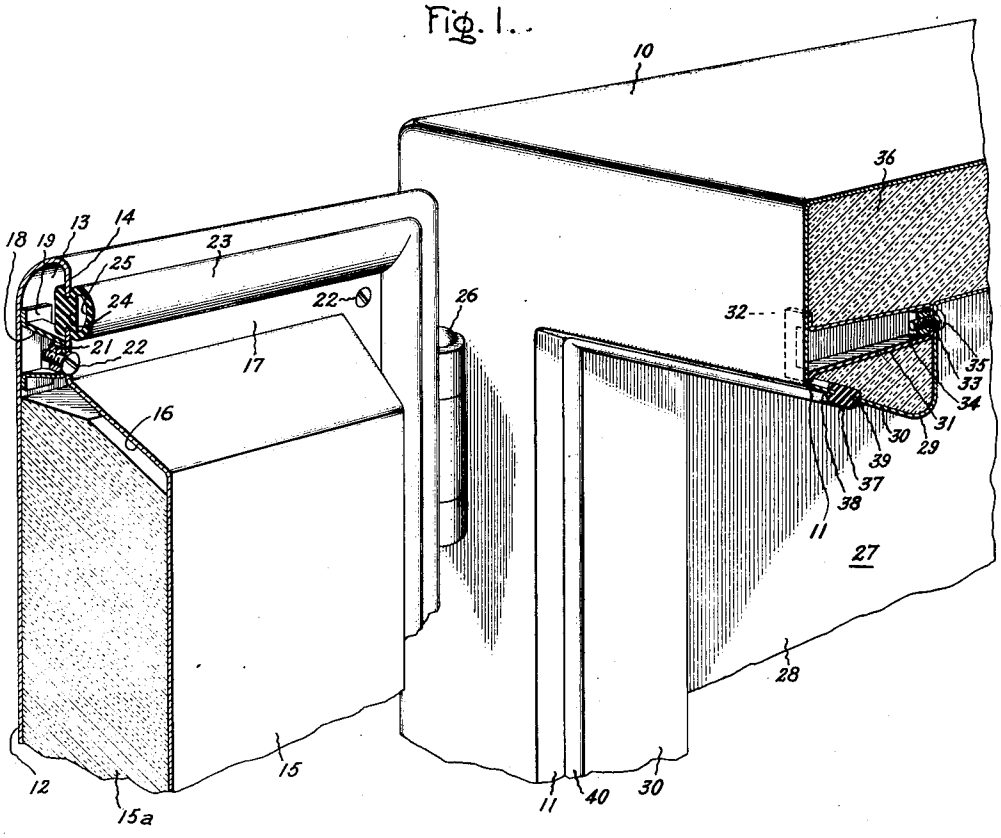
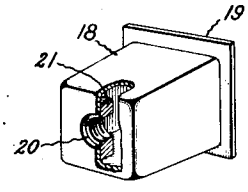


Fig. 2.



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REFRIGERATOR CABINET

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3 Claims. (Cl. 220—15)

My invention relates to refrigerator cabinets, and more particularly to an improved and simplified arrangement for minimizing the leakage of heat from the exterior of the cabinet to the interior thereof.

Refrigerator cabinets such as those designed for household use are ordinarily provided with inner and outer walls which are arranged in spaced relation. A barrier of heat insulation is placed between the inner and outer walls, since the interior of the cabinet is maintained considerably below the temperature prevailing outside the cabinet. The marginal portions of the walls about the edge of the door and door openings of the cabinet should be joined together in such manner as to provide a strong rugged construction which will at the same time conduct a minimum of heat between the walls.

It is an object of my invention to provide a refrigerator cabinet construction including inner and outer walls and an improved arrangement for securing the walls together in spaced relation to form a strong rugged construction in which the flow of heat between the inner and outer walls is minimized.

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 an accompanying drawing in which Fig. 1 is a perspective view partly in section of a portion of a refrigerator cabinet of the household type embodying my invention, and Fig. 2 is a detailed perspective view partly in section of one of the spacers included in the refrigerator cabinet door shown in Fig. 1.

Referring to the drawing, I have shown in Fig. 1 a portion of a refrigerator cabinet of the household type, the outer walls of which are formed by a rectangular sheet metal shell 10 made of steel or the like, having a rectangular opening in the front wall thereof forming a door opening. An inwardly extending peripheral flange 11 extends entirely about the sides of the opening formed in the front wall of the shell 10.

The door opening in the cabinet is closed by a heat insulated door embodying my invention. The outer wall of the door is formed by a rectangular sheet of metal 12 made of steel or the like and having a peripheral U-shaped flange 13 extending entirely about the same. The flange 13 includes a flat inner portion 14 which lies substantially parallel to the main body portion of the outer wall 12. The inner wall of the door is formed by a rectangular sheet of metal 15 preferably made of steel, the inner and outer walls being arranged in spaced relation throughout the extent thereof and separated by heat insulation 15a. The inner wall 15 is provided with an angularly disposed marginal portion 16 which extends entirely about the inner wall 15 and toward the outer wall 12. An integral peripheral flange 17 extends entirely about the marginal portion 16 of the inner wall 15, the peripheral flange 17 being arranged in alinement with the portion 14 of the flange 13 and in spaced relation thereto.

The inner and outer walls 12 and 15 are secured together by a series of cup-shaped spacers 18 having a relatively low heat conductivity. The body portions of the spacers 18 are of the general shape of a truncated pyramid. The cup-shaped spacers 18 are preferably made of thin stainless steel or similar metal having a comparatively low heat conductivity. If the spacers 18 are made of drawn stainless steel, a thickness of about .010 inch gives sufficient strength and at the same time only a small amount of heat is conducted through the spacers because of their small cross-section. The spacers 18 are arranged at intervals about the marginal portions of the door and extend between the peripheral flange 17 on the inner wall 15 and the adjacent portion of the outer wall 12 and in abutting relation thereto. The body portions of the spacers 18 are provided with flat rectangular peripheral flanges 19 extending entirely about the open ends thereof. The flanges 19 are welded, brazed, or otherwise rigidly secured to the adjacent portions of the inner side of the outer wall in face engagement therewith. The closed ends of the spacers 18 are provided with holes 20 therein and nuts 21 are welded or otherwise rigidly secured to the inner sides of the closed ends of the spacers 18 with the threaded opening in the nuts registering with the holes 20 in the closed ends of the spacers. The inner wall 15 of the door is secured in position by a series of bolts 22 which pass through suitable holes formed in the peripheral flange 17, the inner ends thereof being threaded in the nuts 21.

The space between the adjacent edges of the peripheral flanges 13 and 17 of the inner and outer walls 12 and 15, respectively, of the door is closed by a resilient sealing gasket 23 made of soft rubber or the like. The gasket 23 is provided with the dovetail portion 24 retained between the adjacent edges of the flanges 14 and 17 and a hollow striking portion 25. The hollow striking portion 25 of the gasket 23 extends entirely about the edge of the inner wall 15 of the door and when the door is closed it is pressed firmly against the adjacent surfaces of the front wall of the cabinet. The entrance of warm air from the exterior of the cabinet into the interior thereof between the adjacent portions of

the door and outer wall of the cabinet is thus prevented.

In assembling the door construction described above the spacers 18 are positioned on the outer wall 12 and welded thereto. The heat insulation 15 is then positioned on the outer wall 12 and the inner wall 15 is placed thereon. The bolts 22 are then screwed into the nuts 21 thus securing the inner wall 15 in position on the outer wall 12. The sealing gasket 23 is then inserted in its proper position between the alined edges of the peripheral flanges 14 and 17. The door thus formed is supported on the outer shell of the cabinet by suitable hinges 26.

The main portion of the cabinet is also constructed in accordance with my invention. The inner walls of a food storage compartment 27 within the cabinet are formed by a rectangular sheet metal inner liner 28 made of steel or the like. The inner liner 28 is provided with a rectangular opening in the front wall thereof which registers with the somewhat larger rectangular opening formed in the outer shell 10. An angularly disposed marginal portion 29 of the inner liner 28 extends entirely about the opening formed in the front wall thereof and in alinement with the front wall of the shell 10. The marginal portion 29 of the inner liner 28 is provided with a peripheral flange 30 extending entirely about the same. The peripheral flange 30 is flared outwardly and is arranged in alinement with the peripheral flange 11 formed on the outer shell 10, the edges of the flanges 11 and 30 being arranged in spaced relation. The outer shell 10 and inner liner 28 are arranged in spaced relation throughout their extent.

The outer shell 10 and the inner liner 28 are secured together by a series of cup-shaped spacers 31 extending therebetween and in abutting relation thereto. The spacers 31 have a low heat conductivity, preferably being made of thin stainless steel. The spacers 31 are similar to the spacers 18 described above, except that the truncated pyramidal body portions thereof are somewhat more elongated. Rectangular peripheral flanges 32 extend entirely about the open ends of the spacers 31 and are welded or otherwise rigidly secured to the adjacent portions of the inner side of the front wall of the outer shell 10 in face engagement therewith. The closed inner ends of the spacers 31 are provided with holes 33, and nuts 34 are welded to the inner ends of the spacers 31 with the threaded apertures therein registering with the holes 33. Bolts 35 pass through suitable holes formed in the marginal portion 29 of the inner liner 28 and the inner ends thereof are threaded in the nuts 34. The outer shell 10 and inner liner 28 are thus rigidly secured together in spaced relation. Heat insulation 36 is arranged between the outer shell 10 and the inner liner 28.

The space between the adjacent edges of the flanges 11 and 30 formed on the outer shell 10 and inner liner 28, respectively, is closed by a resilient sealing gasket 37 made of soft rubber or the like. The gasket 37 is held in position by the edges of the flanges 11 and 30, which engage grooves 38 and 39 formed in the sides of the gasket. The rounded inner sealing portion 40 of the gasket 37 extends entirely about the door opening of the cabinet, and when the door is closed, the sealing portion 40 of the gasket 37 is pressed firmly against the marginal portion 16 of the inner wall of the door. The gasket 37 thus aids the gasket 23 in further preventing the entrance of warm air into the cooling compartment 27 between the adjacent portions of the door and cabinet.

The sealing gaskets 23 and 37 also prevent the entrance of air into the space between the inner and outer walls of the door and cabinet, respectively. It is necessary to prevent the entrance of air into these spaces since the heat insulation supported therein is usually made of a dry fibrous material, the insulating properties of which are radically reduced when soaked with moisture. If any outside air enters the space between the inner and outer walls, the moisture carried thereby will be condensed on the heat insulation, because of the relatively low temperature of the inner walls of the cabinet and door. Consequently, it is necessary to provide against the entrance of outside air into the spaces in which the insulation is arranged.

Although I have shown a particular embodiment of my invention in connection with the refrigerator cabinet of the household type, I do not desire my invention to be limited to the particular construction shown and described, and I intend in the 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. A refrigerator cabinet construction comprising inner and outer sheet metal walls arranged in spaced relation substantially throughout the extent thereof, heat insulation arranged between said walls, means including a cup-shaped metallic spacer of relatively low heat conductivity extending between said walls for securing said walls together in spaced relation, said cup-shaped spacer being provided with a peripheral flange extending about the open end thereof, said flange being welded in face engagement to one of said walls, and means for securing the closed end of said cup-shaped spacer to the other of said walls.

2. A refrigerator cabinet construction comprising inner and outer sheet metal walls arranged in spaced relation substantially throughout the extent thereof, heat insulation arranged between said walls, and means including a cup-shaped stainless steel spacer extending between said walls for securing said walls together in spaced relation, said cup-shaped spacer being provided with a peripheral flange extending about the open end thereof, said flange being welded in face engagement to one of said walls and means including a bolt for securing the closed end of said cup-shaped spacer to the other of said walls.

3. A refrigerator cabinet construction comprising inner and outer sheet metal walls arranged in spaced relation substantially throughout the extent thereof, heat insulation arranged between said walls, and means including a cup-shaped stainless steel spacer extending between said walls for securing said walls together in spaced relation, said cup-shaped spacer being provided with a peripheral flange extending about the open end thereof and a nut welded to the closed end thereof, said flange being welded in face engagement to one of said walls and said nut being adapted to receive a bolt passing through the other of said walls.

JAMES L. KNIGHT.