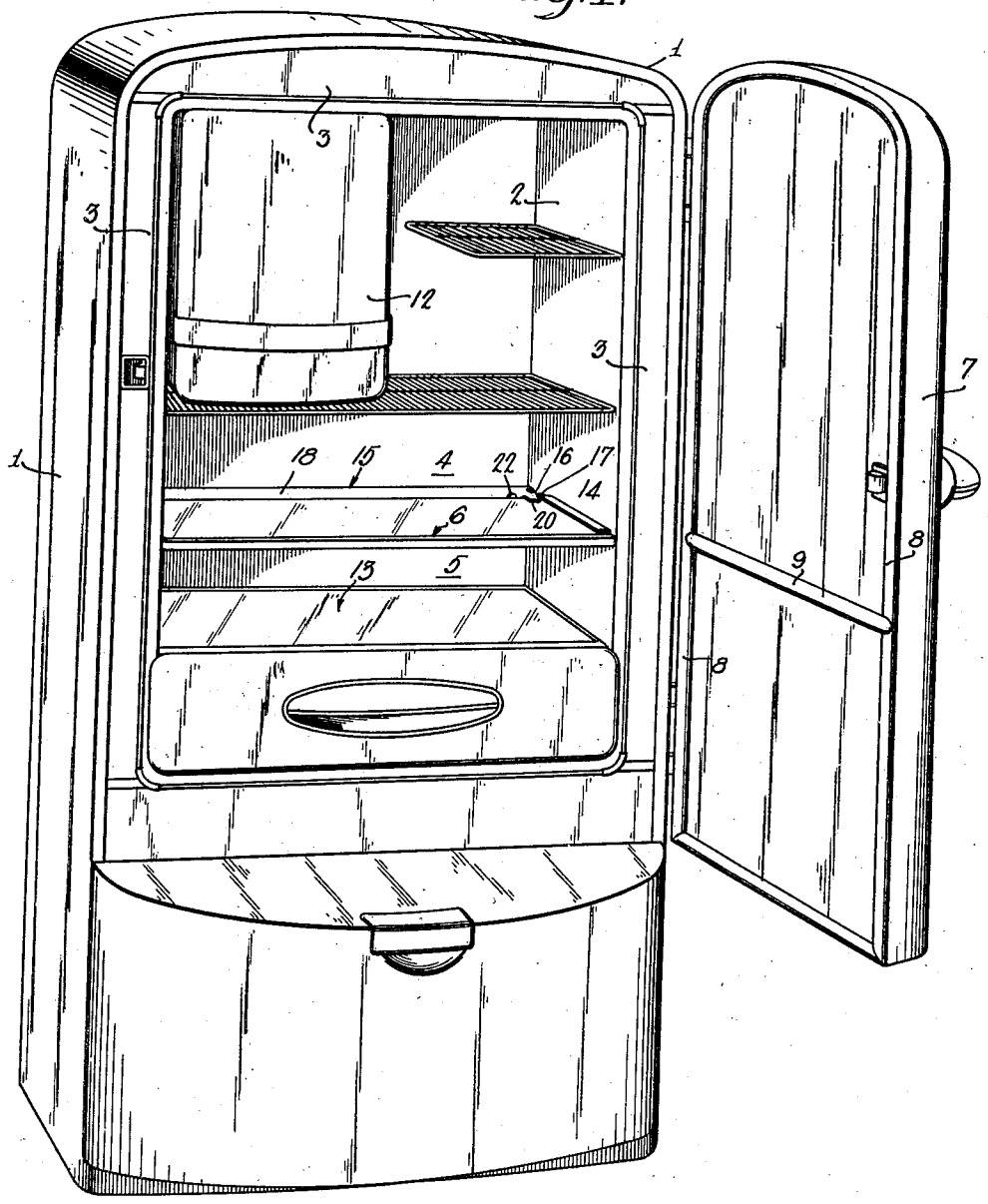
Feb. 9, 1943. T. W. RUNDELL 2,310,872

REFRIGERATOR

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Fig. 1.



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Fig. 2.

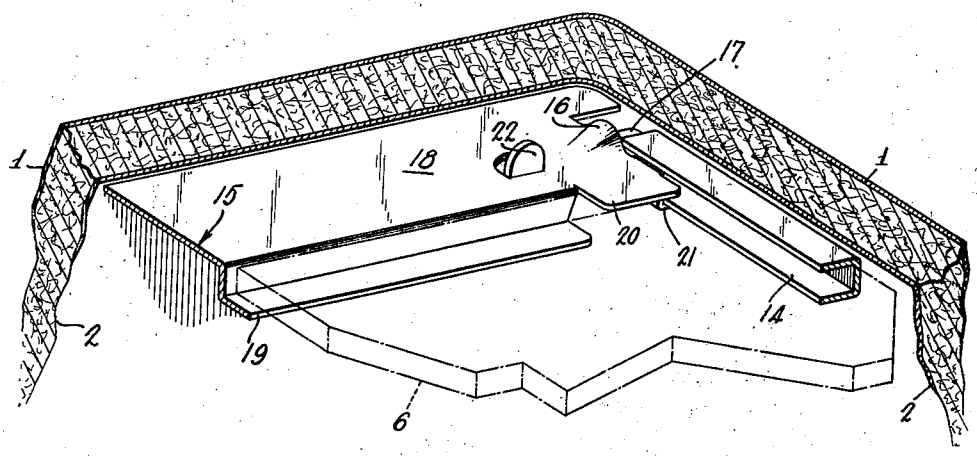
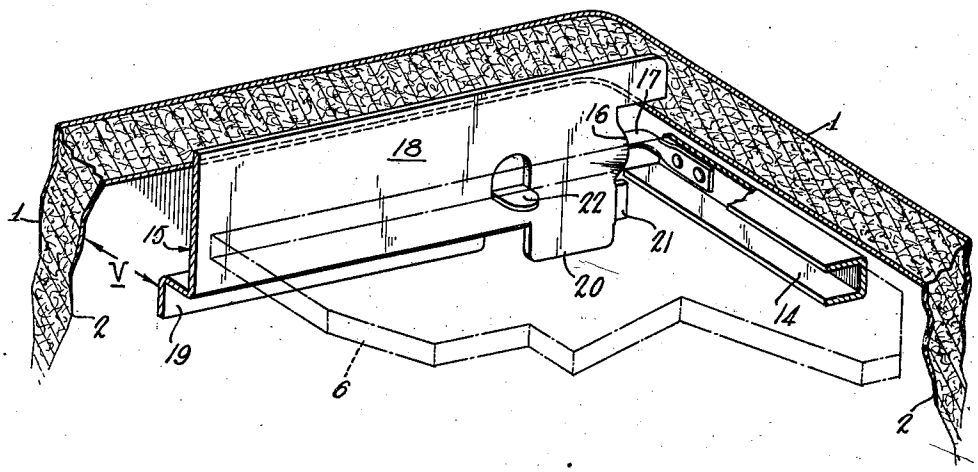


Fig. 3.



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REFRIGERATOR

Theodore W. Rundell, Abington, Pa., assignor to Philco Corporation, Philadelphia, Pa., a corporation of Pennsylvania

Application November 6, 1941, Serial No. 418,082

8 Claims. (Cl. 62—89)

This invention relates to new and useful improvements in domestic refrigerators and more particularly to domestic refrigerators of the type provided with two food storage compartments which are adapted to be cooled and respectively maintained at different conditions of temperature and humidity.

Domestic refrigerators of the type here involved are generally provided with a unitary liner, the interior of which is divided into upper and lower food storage compartments by means of a horizontal partition or shelf. One of these two food storage compartments is usually cooled by an evaporator which is maintained at a temperature below 32° F. for freezing purposes, while the other compartment is cooled by means maintained at a temperature above 32° F. to provide a high humidity zone so that foodstuffs therein, such as fresh fruits, vegetables and the like, will not become dehydrated but will retain substantially their normal moisture content and hence remain relatively fresh and crisp.

The partition or shelf which divides the liner into the upper and lower food storage compartments is substantially imperforate so as normally to prevent the circulation of air between the two compartments. It frequently occurs, however, that moisture content of the air in the higher temperature food storage compartment becomes excessive, and in such cases it is desirable that some limited air circulation between the two compartments be permitted so that dry air from within the colder compartment will absorb some of the excess moisture in the warmer compartment and thereby prevent the foodstuffs in the latter from becoming soft and soggy. On the other hand, on occasions where the moisture content in the warmer compartment is not excessive, or is insufficient, then it is desirable that communication or circulation between the two compartments be substantially prevented.

Accordingly, and with the foregoing in mind, the principal object of the present invention is to provide in a domestic refrigerator of the type set forth, a food compartment partition member which is constructed and arranged to provide a vent for the limited circulation of air between the two food storage compartments when desired and which embodies also a closure member operable to close the vent and thereby prevent the circulation of air between said two compartments.

Another object of the invention is to provide a food compartment partition and vent closure structure of the stated character wherein the vent closure member is constructed and arranged to interlock with the partition in both the closed and open position of said closure member whereby the latter may be secured in either closed or open positions.

A further object of the invention is to provide a partition and vent closure member construction of the type described wherein the said closure member, when in open vent position, serves as a guard member to prevent articles on the partition from dropping through the vent into the lower food storage compartment.

A still further object of the invention is to provide a novel partition and vent closure member of the stated character which is relatively simple and inexpensive to manufacture yet which is efficient, easy to operate and not cumbersome or space consuming.

These and other objects of the invention and the various features and details of the construction and operation thereof are hereinafter fully set forth and described, and shown in the accompanying drawings, in which:

Figure 1 is a view in perspective of a domestic refrigerator embodying the present invention.

Figure 2 is an enlarged fragmentary view in perspective showing the partition and its vent closure member in closed position; and

Figure 3 is a view similar to Figure 2 showing said vent closure member in open position.

Referring now more particularly to the drawings, there is illustrated a domestic refrigerator of the mechanical type comprising a cabinet having the usual outer shell 1 and an inner liner or shell 2 spaced inwardly and insulated from the outer shell 1 by means of insulation and the usual thermal breakerstrip 3.

As shown in Figure 1 of the drawings, the food liner 2 is sub-divided into an upper food storage compartment 4 and a lower food storage compartment 5 by means of a horizontally disposed substantially imperforate partition member 6 which serves also as a shelf. The front access opening to the food liner 2 is provided with a single hinged door or closure 7 having about its inner peripheral surface the usual resilient sealing gasket 8 and also a horizontal resilient gasket member 9 that is disposed at the level or height of the horizontal partition or shelf 6 and arranged, when the door is closed, to engage and seal against the front edge of said partition or shelf 6 and thus prevent the passage of air between the food storage compartments 4 and 5 past the forward edge thereof. The construction and arrangement of the door and its gaskets 8 and 9 preferably is in accordance with the dis-

closures in my co-pending applications Serial No. 343,489, filed July 1, 1940, and Serial No. 415,462, filed October 17, 1941.

Any suitable refrigeration system and equipment may be used to cool the two food storage compartments 4 and 5 and in the refrigerator illustrated in the drawings, the upper compartment 4 is shown as cooled by a suitable evaporator 12, while the lower compartment is cooled by means of a suitable evaporator 13 which may be a cold shelf as illustrated. In refrigerators of the type here involved the cooling means 12 for the upper food storage compartment 4 preferably is maintained at a temperature below 32° F., and the cooling means 13 for the lower food storage compartment 5 is maintained at a temperature above 32° F.

As shown in Figures 2 and 3 of the drawings, the partition or shelf 6 is removably mounted horizontally within the inner liner or shell 2 of the refrigerator with its opposite side edges slidably engaging channel members 14 which are secured to the opposite interior side surfaces of said liner or inner shell 2 by means of screws or the like. These channels 14 do not extend entirely to the rear wall of the inner liner or shell 2 and the partition or shelf 6 likewise has a depth somewhat less than the depth of said liner 2 so that when said partition or shelf 6 is positioned within the liner 2, the rear edge of the partition or shelf 6 is spaced a relatively short distance from the rear wall of said liner thereby providing an opening or vent V for the passage and circulation of air between the upper and lower food storage compartments 4 and 5 respectively.

In order that this opening or vent V may be closed or opened as desired, a suitable closure member 15 is provided and, as shown in the drawings, this closure member 15 is provided at its opposite ends with sockets or the like 16 in which are rotatably received inwardly projecting spindles or the like 17 secured respectively to the inner ends of the channels 14 at opposite sides of the liner or inner shell 2. By this construction the closure member 15 is mounted for pivotal movement within the space or vent V between the rear edge of the partition or shelf 6 and the rear wall of said liner or inner shell 2.

The closure member 15 comprises a body portion 18 that extends the full width of the liner or inner shell 2 and has a depth substantially equal to the depth of the vent V provided between the partition rear edge and the liner rear wall when the said partition is inserted into the liner to the extent permitted by the channels 14.

The forward edge of the body portion 18 of the closure member 15 terminates in an offset projecting parallel flange portion 19. This offset flange portion 19 does not extend entirely to the opposite ends of the body portion 18 of the member 15 and there is thus provided at each end of the body portion a coplanar forwardly projecting tongue portion 20. In addition, this tongue 20 is provided with an endwise projecting and offset spaced parallel tab 21 which extends into the path of the adjacent channel 14 and is arranged to engage the underside of said channel 14 and serves as a position-limiting stop when the closure 15 is in closed position with the body portion 18 thereof horizontally within the liner 2 as shown in Figure 2 of the drawings.

The previously mentioned offset projecting flange 19 at the forward edge of the body portion 18 of the closure member 15 is disposed parallel to and spaced from the plane of the tongue 20 and body portion 18 a distance substantially equal to the thickness of the partition or shelf 6 so that when said closure member 15 is in the vent closing position shown in Figure 2 of the drawings the rear edge of said partition or shelf 6 may be received and engaged between said flange portion 19 and the tongue portions 20, as shown, thereby providing a suitable support for the rear edge of the partition or shelf 6 and serving also to secure the closure 15 in such vent closing position.

In order to move the closure member 15 to and from open or closed position, it is necessary, of course, that the partition or shelf 6 be slid forwardly and outwardly of the liner 2 at least a distance sufficient to permit the projecting portions of the closure 15, such as the tongue 20 to clear the rear edge of said partition or shelf 6, after which the partition or shelf 6 may be moved inwardly of the liner 2 and its rear edge engaged with said closure member 15.

For the purpose of securing said closure 15 in its open position, as shown in Figure 3 of the drawings, there is pressed or stamped out from the body portion 18 of the closure 15 one or more lugs or the like 22. These lugs 22 are disposed at right angles to the plane of the body portion 18 and are positioned with respect thereto so as to engage under the rear edge of the partition or shelf 6 when the closure 15 is in the open position in the manner shown in Figure 3.

It will be observed that in the open position of the closure member 15 shown in Figure 3 the body portion 18 thereof projects upwardly adjacent and along the rear edge of the partition or shelf 6 to a height somewhat above the plane of the top surface thereof, and by this construction it will be seen that when the vent V is open to permit of the circulation of air between the upper and lower food storage compartments 4 and 5 respectively, this upwardly projecting portion of the body portion 18 of the closure member 15 serves as a guard rail or member to prevent foodstuffs and other articles from being pushed off the rear edge portion of the partition or shelf 6 and falling or dropping down through the vent V into the lower food storage compartment 5.

From the foregoing it will be seen that the present invention provides for domestic refrigerators of the type here involved a partition or shelf construction embodying a novel circulation vent closure member that is operable at will either to open the vent and permit limited circulation of air between the two food storage compartments, or to close the vent and thereby prevent the circulation of air between the two food compartments. The invention further provides a novel vent closure member that is constructed and arranged to interlock with the partition in both the closed and open positions thereof and which, in the open position, functions also as a guard member to prevent articles on the partition from being pushed therefrom and dropped through the vent into the lower food storage compartment. The invention further provides a construction that is relatively simple and inexpensive to manufacture, yet which is highly efficient, easy to operate and not cumbersome or space-consuming.

While a particular embodiment of the invention has been illustrated and described herein, it is not intended that the invention be limited to said disclosure but that changes and modifi-

cations may be made within the scope of the annexed claims.

I claim:

1. In a domestic refrigerator having a food liner sub-divided into upper and lower food storage compartments by a horizontal substantially imperforate slidably mounted partition of less depth than said food liner to provide a vent at the rear of said partition for the circulation of air between said upper and lower compartments, a member for closing the vent pivotally mounted in the food liner and having a substantially imperforate body portion arranged when the member is in one position substantially to close said vent and in another position thereof to leave the vent substantially unobstructed, means at the forward edge of said member arranged for engagement by the rear edge of the partition when the member is in vent closing position thereby to secure said member in closed position, and means projecting from the body portion of the member arranged to engage under the partition rear edge when said member is in open vent position thereby to secure the member in open position.

2. In a domestic refrigerator having a food liner sub-divided into upper and lower food storage compartments by a horizontal substantially imperforate slidably mounted partition of less depth than said food liner to provide a vent at the rear of said partition for the circulation of air between said upper and lower compartments, a member for closing the vent pivotally mounted in the food liner and having a substantially imperforate body portion arranged when the member is in one position substantially to close said vent and in another position thereof to leave the vent substantially unobstructed, means at the forward edge of said member arranged for engagement by the rear edge of the partition when the member is in vent closing position thereby to secure said member in closed position, and means projecting from the body portion of the member arranged to engage under the partition rear edge when said member is in open vent position thereby to secure the member in open position, the construction and arrangement of said member being such that when in closed position its body portion is horizontally disposed in the plane of the partition and when in open position said body portion is disposed vertically adjacent the partition rear edge and extends above the latter to provide a guard for preventing articles on said partition from being pushed off the rear edge thereof and falling through the vent into the lower food storage compartment.

3. In a domestic refrigerator having a food liner subdivided into upper and lower food storage compartments by a horizontal substantially imperforate slidably mounted partition of less depth than said food liner to provide a vent at the rear of said partition for the circulation of air between said upper and lower compartments, a member for closing the vent pivotally mounted in the food liner and having a substantially imperforate body portion arranged when the member is in one position substantially to close said vent and in another position thereof to leave the vent substantially unobstructed, relatively spaced tongue and offset flange portions at the forward edge of said member between which the partition rear edge is received and engaged when the member is in vent closing position thereby to secure said member in closed position, and at least one lug projecting from the body portion of the member arranged to engage under the partition rear edge when said member is in open vent position thereby to secure the member in open position.

4. In a domestic refrigerator having a food liner subdivided into upper and lower food storage compartments by a horizontal substantially imperforate slidably mounted partition of less depth than said food liner to provide a vent at the rear of said partition for the circulation of air between said upper and lower compartments, a member for closing the vent pivotally mounted in the food liner and having a substantially imperforate body portion arranged when the member is in one position substantially to close said vent and in another position thereof to leave the vent substantially unobstructed, relatively spaced tongue and offset flange portions at the forward edge of said member between which the partition rear edge is received and engaged when the member is in vent closing position thereby to secure said member in closed position, and at least one lug projecting from the body portion of the member arranged to engage under the partition rear edge when said member is in open vent position thereby to secure the member in open position, the construction and arrangement of said member being such that when in closed position its body portion is horizontally disposed in the plane of the partition and when in open position said body portion is disposed vertically adjacent the partition rear edge and extends above the latter to provide a guard for preventing articles on said partition from being pushed off the rear edge thereof and falling through the vent into the lower food storage compartment.

5. In a domestic refrigerator having a food liner subdivided into upper and lower food storage compartments by a horizontal substantially imperforate partition of less depth than said food liner to provide a vent at the rear of said partition for the circulation of air between said upper and lower compartments and means for slidably supporting said partition in the food liner, a member for closing the vent pivotally mounted in the food liner and having a substantially imperforate body portion arranged when the member is in one position substantially to close said vent and in another position thereof to leave the vent substantially unobstructed, means at the forward edge of said member arranged for engagement by the rear edge of the partition when the member is in vent closing position thereby to secure said member in closed position, means projecting from the body portion of the member arranged to engage under the partition rear edge when said member is in open vent position thereby to secure the member in open position, and other means projecting from said member arranged to engage the partition supporting means when the member is in closed position and thereby provide a position limiting stop for the closed position of said member.

6. In a domestic refrigerator having a food liner subdivided into upper and lower food storage compartments by a horizontal substantially imperforate partition of less depth than said food liner to provide a vent at the rear of said partition for the circulation of air between said upper and lower compartments and means for slidably supporting said partition in the food liner, a member for closing the vent pivotally mounted in the food liner and having a substantially imperforate body portion arranged when the member is in one position substantially

to close said vent and in another position thereof to leave the vent substantially unobstructed, means at the forward edge of said member arranged for engagement by the rear edge of the partition when the member is in vent closing position thereby to secure said member in closed position, means projecting from the body portion of the member arranged to engage under the partition rear edge when said member is in open vent position thereby to secure the member in open position, and other means projecting from said member arranged to engage the partition supporting means when the member is in closed position and thereby provide a position limiting stop for the closed position of said member, the construction and arrangement of said member being such that when in closed position its body portion is horizontally disposed in the plane of the partition and when in open position said body portion is disposed vertically adjacent the partition rear edge and extends above the latter to provide a guard for preventing articles on said partition from being pushed off the rear edge thereof and falling through the vent into the lower food storage compartment.

7. In a domestic refrigerator having a food liner subdivided into upper and lower food storage compartments by a horizontal substantially imperforate partition of less depth than said food liner to provide a vent at the rear of said partition for the circulation of air between said upper and lower compartments and means for slidably supporting said partition in the food liner, a member for closing the vent pivotally mounted in the food liner and having a substantially imperforate body portion arranged when the member is in one position substantially to close said vent and in another position thereof to leave the vent substantially unobstructed, relatively spaced tongue and offset flange portions at the forward edge of said member between which the partition rear edge is received and engaged when the member is in vent closing position thereby to secure said member in closed position, at least one lug projecting from the body portion of the member arranged to engage under the partition rear edge when said member is in open vent position thereby to secure the member in open position, and other means projecting from said member arranged to engage the partition supporting means when the member is in closed position and thereby provide a position limiting stop for the closed position of said member.

8. In a domestic refrigerator having a food liner subdivided into upper and lower food storage compartments by a horizontal substantially imperforate partition of less depth than said food liner to provide a vent at the rear of said partition for the circulation of air between said upper and lower compartments and means for slidably supporting said partition in the food liner, a member for closing the vent pivotally mounted in the food liner and having a substantially imperforate body portion arranged when the member is in one position substantially to close said vent and in another position thereof to leave the vent substantially unobstructed, relatively spaced tongue and offset flange portions at the forward edge of said member between which the partition rear edge is received and engaged when the member is in vent closing position thereby to secure said member in closed position, at least one lug projecting from the body portion of the member arranged to engage under the partition rear edge when said member is in open vent position thereby to secure the member in open position, and other means projecting from said member arranged to engage the partition supporting means when the member is in closed position and thereby provide a position limiting stop for the closed position of said member, the construction and arrangement of said member being such that when in closed position its body portion is horizontally disposed in the plane of the partition and when in open position said body is disposed vertically adjacent the partition rear edge and extends above the latter to provide a guard for preventing articles on said partition from being pushed off the rear edge thereof and falling through the vent into the lower food storage compartment.

THEODORE W. RUNDELL.