

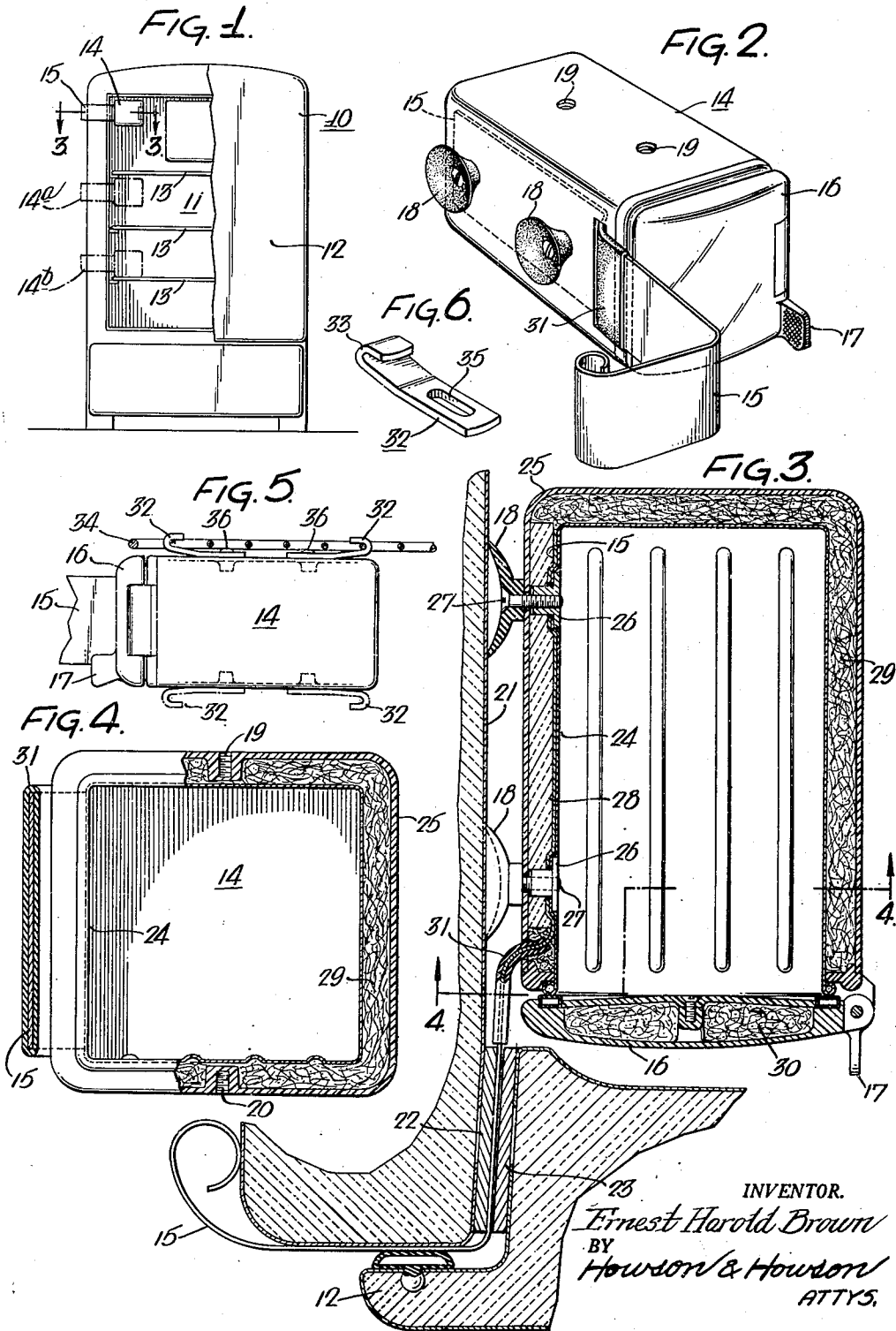
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REFRIGERATOR APPARATUS

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REFRIGERATOR APPARATUS

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4 Claims. (Cl. 62-89)

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This invention relates to refrigerators and more particularly to refrigerators having an auxiliary compartment, within the usual refrigerated compartment, for storage of butter and the like.

It is well known that a compartment for storage of butter and like articles must be maintained at a higher temperature than that of the usual refrigerated compartment of a refrigerator, and in the past various arrangements have been proposed for this purpose. One way of maintaining the desired temperature in such an auxiliary compartment is to provide for the transfer of heat from the outside to the auxiliary compartment. However, prior arrangements which have sought to utilize this general principle have been relatively complicated and expensive in that they have required special construction or modification of the refrigerator cabinet structure.

The principal object of the present invention is to provide an arrangement for the above-stated purpose which is simple, inexpensive and efficient, and which does not require any special construction or modification of the refrigerator cabinet.

Another object of this invention is to provide a unitary device which may be readily inserted in an existing refrigerator for storage of butter and like articles.

Other objects and features of the invention will be apparent from the following detailed description with reference to the accompanying drawing in which:

Fig. 1 is a small-scale front elevational view of a refrigerator having the invention applied thereto, a portion of the refrigerator door being broken away to disclose the interior;

Fig. 2 is a perspective view, on a substantially larger scale, of a unitary device according to the present invention, which device is present in the refrigerator of Fig. 1;

Fig. 3 is a relatively large scale sectional view taken along line 3-3 of Fig. 1;

Fig. 4 is a sectional view taken along line 4-4 of Fig. 3;

Fig. 5 is a small-scale side elevational view of a unitary device according to the invention employing a different form of fastening means; and

Fig. 6 is a perspective view of one of the fastening elements employed in the device of Fig. 5.

In accordance with the present invention, an auxiliary compartment is provided within the usual refrigerated compartment of a conventional refrigerator, for storage of butter and like

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articles, and the temperature within the auxiliary compartment is maintained at a desired level above the temperature in the refrigerated compartment by the provision of heat transfer means which extends from the auxiliary compartment through the door opening of the refrigerator to the exterior of the refrigerator cabinet, such means serving to transfer heat from the outside to the auxiliary compartment. Preferably, the auxiliary compartment and the heat transfer means are assembled into a unit which may be readily inserted within the refrigerated compartment of a refrigerator or removed therefrom. The provision of such a unitary device makes it possible to provide an existing refrigerator with an auxiliary storage compartment, whether or not such refrigerator is already provided with an auxiliary storage compartment. In this connection it should be borne in mind that an additional storage compartment for butter and like articles is sometimes desirable. However, the invention contemplates any utilization of the above-mentioned combination comprising the auxiliary compartment and the associated heat transfer means adapted to extend from such compartment through the door opening of a refrigerator. Thus, a unitary device comprising this combination may be permanently secured as a part of the refrigerator, either during or after manufacture of the refrigerator, or the combination may be built into the refrigerator during manufacture thereof as an integral part of the refrigerator.

Referring to Fig. 1 of the drawing, there is shown a conventional refrigerator 10 within which there is a refrigerator compartment 11 closed by door 12. Within the refrigerated compartment 11 are the usual shelves 13. In accordance with the present invention, a storage device 14 is provided within the refrigerated compartment 11, and this device includes heat transfer means which may be in the form of a heat conductive member 15. This member may be formed of suitable sheet metal and it extends through the door opening of the refrigerator to the outside air. In the illustration of Fig. 1 the device is in the form of a unit which may be readily inserted within an existing refrigerator, and such unit may be supported within the refrigerator in various ways. In Fig. 1 it is shown mounted on the side wall of the refrigerator in the upper left-hand corner thereof, and in the dot-and-dash illustrations at 14a and 14b the device is represented as being mounted on the bottom or top of a shelf.

Referring now to Fig. 2, the device 14 is in

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the form of an enclosure equipped with a door 16 which may be provided with an operating handle 17. For attachment to a wall of the refrigerator, the device may be provided with suction cup members 18. For attachment to a shelf of the refrigerator, the device may be provided with threaded apertures 19 to enable securement of shelf-mounting members as herein-after described. As may be seen in Fig. 4, similar threaded apertures 20 may be provided in the bottom of the device for use when it is desired to mount the device on top of a shelf.

Fig. 3 shows the device mounted in association with the door opening of the refrigerator. In this illustration, the device is mounted by means of the suction cup members 18 on the side wall 21 of the refrigerator, and it will be noted that the heat conducting member 15 extends across the breaker strip 22, the said member being in the form of a thin, flat strip so that it does not interfere with the operation of the door 12. It will be seen that when the door is closed, as shown, the member 15 is disposed between the breaker strips 22 and 23. In common practice, there is enough clearance between the breaker strips to enable such disposition of the member 15. Of course if necessary the breaker strips could be recessed to accommodate the member 15. In the form shown the outer end of the heat conductive member 15 is curled or looped, with the inner portion thereof engaging the outside of the refrigerator wall. This eliminates exposure of any sharp end, and it also presents a substantial portion of the member to the outside air and, furthermore, with this arrangement the member may serve additionally as a spring clamp embracing the refrigerator wall. It may also pick up some heat from the refrigerator wall.

Figs. 3 and 4 show a mechanical construction of the device, it being understood that the details of construction are unimportant and may be modified as desired. Preferably, the device 14 comprises a metallic liner 24 which is thermally insulated from the refrigerator compartment, and the heat conducting member 15 preferably engages the liner 24 to conduct heat directly thereto. In the illustrated structure, the liner 24 is surrounded by an outer shell 25 which is in spaced relation to the liner, and on one wall screw-receiving members 26 are provided to receive screws 27 for attachment of the vacuum cupped members 18. Within the same wall a heat insulating plate 28 is provided and serves to hold the heat conducting member 15 flat against the liner 24, said member extending over substantially the entire side wall of the liner. Within the other walls suitable thermal insulation material 29 is provided. The door 16 is also provided with thermal insulation material 30.

In the arrangement shown, the heat conducting member 15 extends from the side wall of the device, and in order to prevent said member from being substantially affected by the temperature within the main refrigerator compartment, a sleeve 31 is provided on the portion of said member which would otherwise be exposed within the refrigerator compartment. This sleeve may be formed of rubber or other suitable material having low heat conductivity.

When it is desired to mount the device on a shelf of the refrigerator, this may be done by means of mounting members such as shown at 32 in Figs. 5 and 6. Each mounting member is in the form of a strip having a bent or hooked end 33 to engage a rod of the shelf 34, and also

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having an elongated aperture 35 to receive a fastening screw 36. It will now be seen that the purpose of the threaded apertures 19 and 20 previously mentioned is to accommodate the screws 36. Fig. 5 shows the device suspended from a shelf 34. When it is desired to mount the device on top of a shelf, mounting elements may be secured to the bottom of the device as shown in dot-and-dash outline in Fig. 5.

While a preferred embodiment of the invention has been illustrated and described, it is to be understood that the invention is not limited thereto but contemplates any utilization of the combination hereinbefore mentioned. Moreover, the structure may be variously modified without departing from the invention. For example, the device 14 could be adapted for mounting on the refrigerator door. Also the heat transfer means might comprise flattened conduit members for conveying warm air from outside into the auxiliary storage compartment and for conveying cool air to the outside.

I claim:

1. In a refrigerator including a refrigerated compartment having a door-closed opening and a breaker strip thereabout, a thermally insulated auxiliary compartment within said refrigerated compartment, and heat transfer means extending from said auxiliary compartment through said door opening and across said breaker strip to the exterior of said cabinet for transferring heat from the outside to said auxiliary compartment, whereby to maintain a temperature in said auxiliary compartment above the temperature in said refrigerated compartment and suitable for preserving butter and the like.

2. In a refrigerator including a refrigerated compartment having a door-closing opening and a breaker strip thereabout, a thermally insulated auxiliary compartment within said refrigerated compartment, said auxiliary compartment having a metal liner, and a heat conducting member extending from the liner of said auxiliary compartment through said door opening and across said breaker strip to the exterior of said cabinet for conducting heat from the outside to said auxiliary compartment, whereby to maintain a temperature in said auxiliary compartment above the temperature in said refrigerated compartment and suitable for preserving butter and the like.

3. A device for use in conjunction with a refrigerated compartment of an existing refrigerator having a door opening with a breaker strip and an associated door, said device comprising a storage enclosure adapted to be inserted within said refrigerated compartment to be cooled thereby, and heat transfer means extending from said enclosure and arranged to extend through said door opening and across said breaker strip to the outside without interfering with the operation of the refrigerator door, whereby sufficient heat is conducted from the outside to said enclosure to maintain the inside temperature of the enclosure above the temperature of said refrigerated compartment and within a range suitable for preservation of butter and the like.

4. A device for use in conjunction with a refrigerated compartment of an existing refrigerator having a door opening with a breaker strip and an associated door, said device comprising a storage enclosure adapted to be inserted within said refrigerator compartment to be cooled thereby, said enclosure including a heat-conductive liner surrounded by a heat insulation medium, and a heat-conductive member extending from

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said liner and arranged to extend through said door opening and across said breaker strip to the outside without interfering with the operation of the refrigerator door, whereby sufficient heat is conducted from the outside to said enclosure to maintain the inside temperature of the enclosure above the temperature of said refrigerated compartment and within a range suitable for preservation of butter and the like.

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