The present invention relates to refrigerating apparatus and more particularly to a hinge arrangement between a refrigerant evaporator and a door therefor.

It is an object of the invention to provide in a refrigerating apparatus having a refrigerant evaporator, an improved hinge arrangement that will assure self-alignment of the door gasket and form an effective seal therewith.

It is another object of the present invention to provide an improved hinge for evaporator doors that will permit the opening and the closing of the door without compressing, rolling or distorting the gasket secured around the door opening, particularly the strip of gasket lying adjacent the line of pivot of the door.

It is a further object of the present invention to provide an improved hinge arrangement for evaporator doors that are durable in use, highly efficient in operation, and economical in manufacture.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred form of the invention is clearly shown.

In the drawings:

Fig. 1 is a fragmentary front view of a refrigerator cabinet with parts broken away illustrating the invention applied;

Fig. 2 is an enlarged view taken along the line 2—2 of Fig. 1 with parts broken away and parts shown in section;

Fig. 3 is a fragmentary view similar to Fig. 2 with the invention shown in open position;

Fig. 4 is a fragmentary view in cross section taken along line 4—4 of Fig. 2;

Fig. 5 is a fragmentary view in cross section taken along line 5—5 of Fig. 2.

Shown in the drawing is a refrigerator cabinet 12 having a food storage compartment 14. A door 16 closes the opening to the compartment. The cabinet is formed with an outer shell 18 enclosing in spaced relation an inner liner 20 which forms the walls of the food storage compartment. Heat insulation material 22 is placed between the liner 20 and shell 18.

Suspended within the food storage compartment 18 is an evaporator 24 having a compartment 26. The evaporator 24 is formed of a metal sleeve 28 which comprises the top, bottom, and side walls for the compartment 26. One end of the sleeve is closed by a panel (not shown) to form a rear wall of the compartment, the opposite or front end is closed by a door 30. A tubing 29 is continuously wrapped about the sleeve 28 through which is adapted to flow refrigerant to effect cooling of the compartment 26, and the cooling of the circulating air in the food storage compartment 14.

A gasket 32, secured to evaporator 24, is provided to extend about the opening to the compartment 26 against which the door 30 engages to provide an airtight seal to prevent air circulation between the compartments. The gasket 32 is formed with an enlarged section 34 and an extended thin section 36. The enlarged section 34 is secured in a pocket 38 formed on the sleeve 28 adjacent to and extending peripheral to the opening to compartment 26. The thin section 36 of the gasket extends forwardly and beyond the edge of the sleeve 28 for engagement with the inner face of the door 30. The gasket 32 extends about the perimeter of the evaporator 24 and opening to compartment 26.

Secured to opposite side walls of the door 30 are hinge leaves 40 that form with a respective bracket arm 42 a hinge. As a hinge is located at each side of the door, and as each is identical in construction, a description of one is believed sufficient. Secured in the pintle or hinge leaf 40 is a hinge pin 44 that extends into and through slot 46 formed in the bracket arm 42. The bracket arm 42 is secured by screws 43 to a side wall of the liner. The hinge leaf is formed with a cam face edge 48 that extends concentric about the hinge pin 44 and adapted to be engaged by cam follower or stud 50 secured in bracket arm 42. One end of the cam 48 terminates in a recess 52 and its opposite end is provided with a limit stop or abutment 54. A coil spring 56 is provided to assist in closing of the door, one end of the spring is secured to the hinge leaf and the opposite end to a stud 58 secured in the liner 20.

Normally the stud 50 will lie in the recess 52 of the cam when the door is in closed position. As the door is opened the initial opening action will cause the cam face 48 of the hinge leaf to ride the stud 50 moving the door in a linear line outwardly away from engagement with the gasket 32. The outward movement of the door is guided by the hinge pin 44 sliding in the slot 46. Upon the disengagement of the door from the gasket it will swing on the axis of hinge pin 44 until the stud 50 abuts against the limit stop 54.

During the opening and closing action of the door the tension of spring 56 will maintain the cam 48 in contact with the stud 50. This arrangement maintains the door in a spaced relation away from the gasket while it is swinging on its axis. In moving to closing position the door is held in a spaced relation until a near vertical position is reached whereupon the recess 52 aligns with the stud 50 allowing the spring to move the door in a linear line into sealing engagement with the gasket 32. It will be noted that the movement of the door will never crimp, roll or compress the gasket, particularly that portion of the gasket that lies adjacent the line of pivot of the door in either its opening or closing action. Thus there is provided a hinge arrangement that will permit the door and gasket to maintain an airtight sealing engagement at all times.

Though the present invention is arranged to illustrate its use with a drop type door swinging on a horizontally arranged axis permitting the door to be used as a shelf in open position, it will be apparent that the invention may be readily arranged for use with doors swinging on a vertical axis with the same objects and advantages hereinafore described.

Although only a preferred form of the invention has been illustrated, and that form described in detail, it will be apparent to those skilled in the art that various modifications may be made therein without departing from the spirit of the appended claims.
3. I claim:

1. In a refrigerator, a refrigerant evaporator member including a compartment having an access opening and a hinge edge, a closure member closing said opening having a hinge edge, a seal interposed between said members and carried by one of them, a hinge connecting said hinge edges together having a pintle movable rectilinearly toward and away from the plane of the access opening, yieldable means urging said hinge edges together, and a cam operable to move the hinge edge of said closure member away from the hinge edge of said evaporator by and as said closure member is pivoted toward open position.

2. In a refrigerator, a refrigerant evaporator member including a compartment having an access opening and a hinge edge, a closure member closing the opening having a hinge edge, a displaceable seal interposed between said members and carried by one of them, a pintle carried by one of said members and pivoted on the other, said pintle connecting the hinge edges of said members together and being movable toward and away from the plane of said opening substantially normal thereto, resilient means urging the hinge edges of said members together, and a cam having its center of eccentricity in the same plane as the plane of rectilinear movement of said pintle and operable on opening of said closure member to move said hinge edges apart.

3. In a refrigerator, a refrigerant evaporator member including a compartment having an access opening and a hinge edge, a closure member closing the opening having a hinge edge, a seal of displaceable material interposed between said members and carried by one of them, said seal including a strip portion extending along and displaced by the hinge edges when said closure member is closed, a pintle in a plane with said strip portion substantially normal to the plane at the access opening, said pintle being rectilinearly movable in said first plane toward and away from said strip portion on opening of said closure member, yieldable means urging said hinge edges together, and a cam having its center of eccentricity in said first plane operable by and on opening of said closure member to move said pintle away from said strip portion.

4. In a refrigerator having a compartment access opening closed by a closure member engaging against a seal around the opening, a hinge for said closure member comprising, a fixed hinge member, a second and pivotal hinge member, a slot in one of said hinge members, a pintle on the other of said hinge members engaging and movable longitudinally in said slot, said pintle being biased toward one end of the slot, a cam on one of said hinge members, and a follower on the other of said hinge members on the other side of said cam from said pintle cooperating with said cam to move the pintle toward the other end of said slot on pivotal movement of said second hinge member in one direction.

5. In a refrigerator having a compartment access opening closed by a pivotal closure member engaging a seal around the opening, a hinge for the closure member comprising, a hinge member to be fixed relative to the closure member, a second hinge member to be attached to and movable with the closure member, a slot in one of said hinge members, a pintle on the other of said hinge members engageable in and movable along said slot, a cam follower on the other of said hinge members in the same plane with said pintle, said pintle being biased toward one end of said slot, and a cam on said one hinge member between and in the same plane as said pintle and follower cooperating with the latter on pivoting of said pivotal hinge member in one direction to move said biased pintle toward the other end of said slot.

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