Sept. 26, 1944. W. PEGLOW 2,359,150

LATCH CONSTRUCTION

Filed July 10, 1941 3 Sheets-Sheet 1

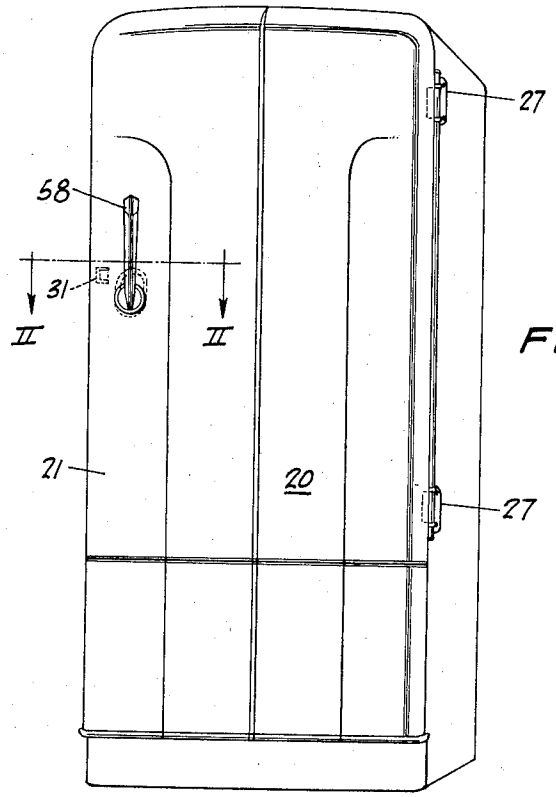

FIG. 1.

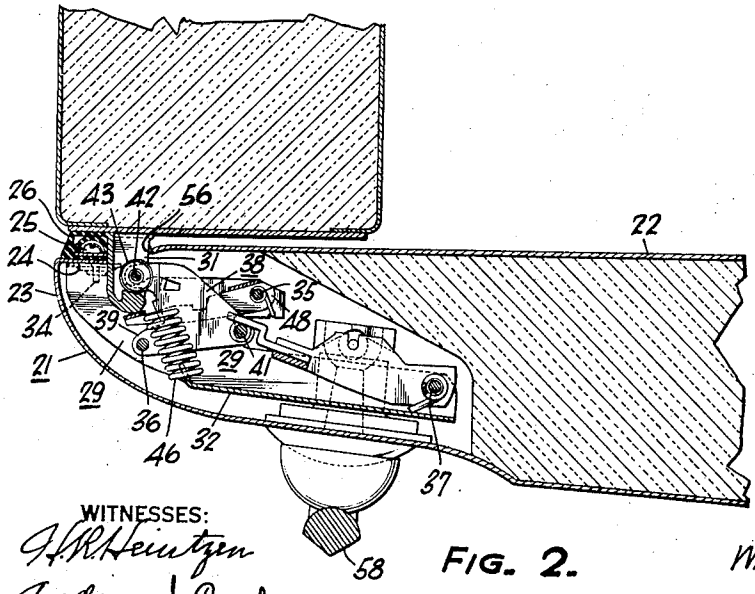

FIG. 2.

WITNESSES:

J. R. Heintzen

Andrew F. Cook

INVENTOR

WALTER PEGLOW

BY Wasteign

ATTORNEY

Sept. 26, 1944. W. PEGLOW 2,359,150

LATCH CONSTRUCTION

Filed July 10, 1941 3 Sheets-Sheet 2

FIG. 3.

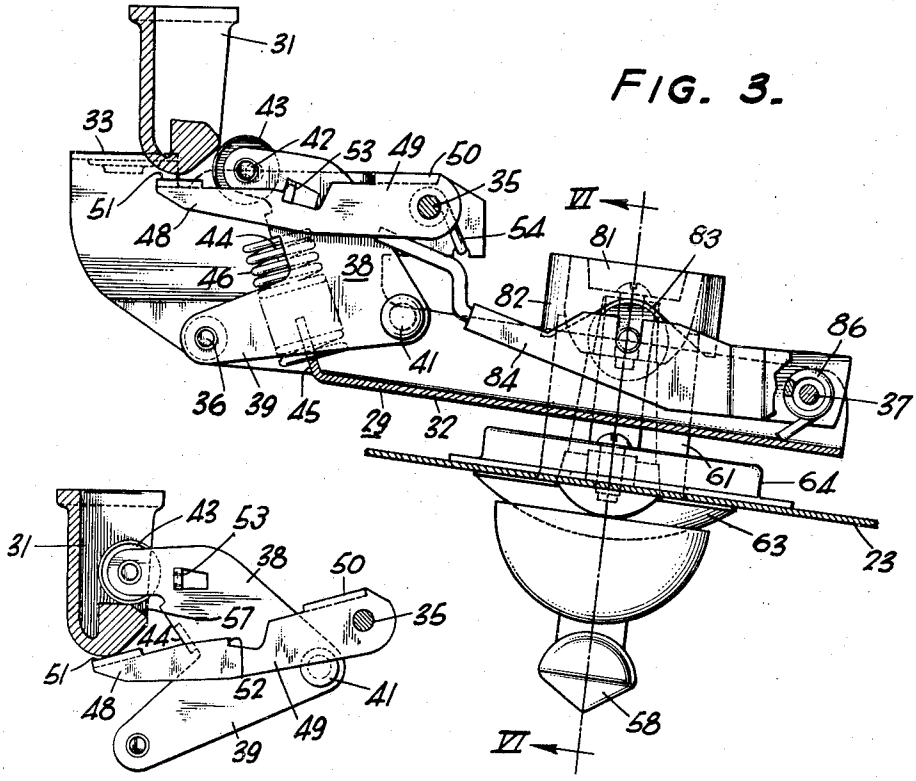

FIG. 4.

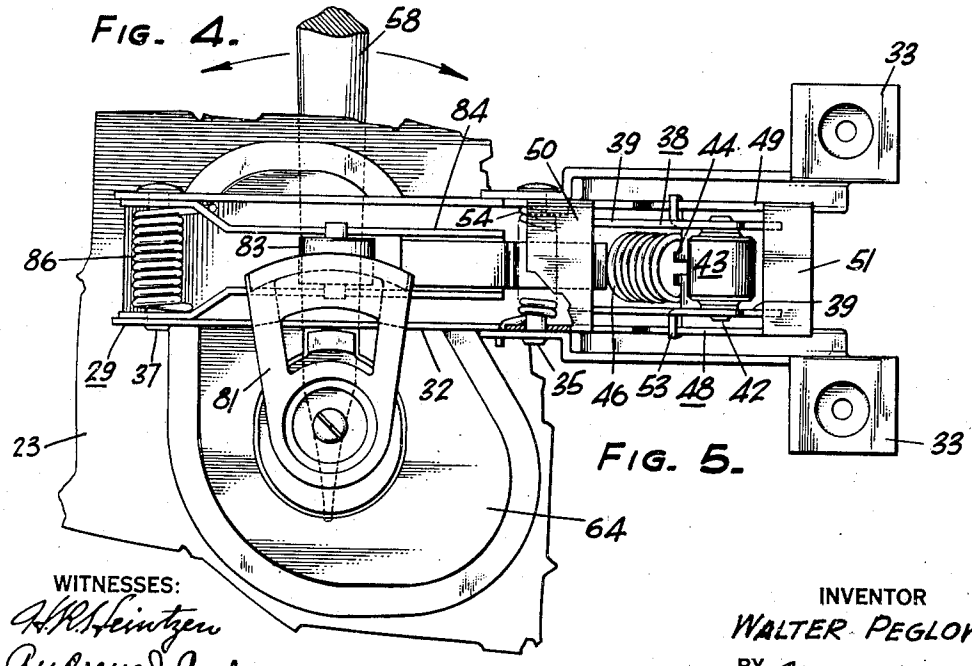

FIG. 5.

WITNESSES:
H. R. Steintzen
Andrew J. Cook

INVENTOR
WALTER PEGLOW
BY Wastegr
ATTORNEY

Sept. 26, 1944. W. PEGLOW 2,359,150

LATCH CONSTRUCTION

Filed July 10, 1941 3 Sheets-Sheet 3

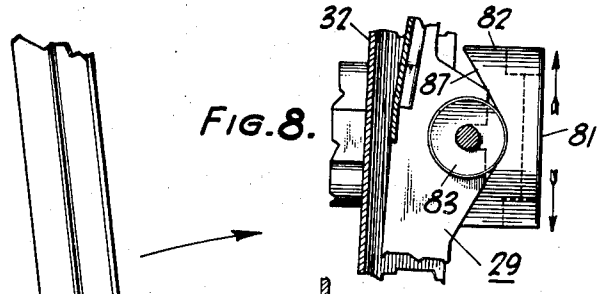

FIG. 8.

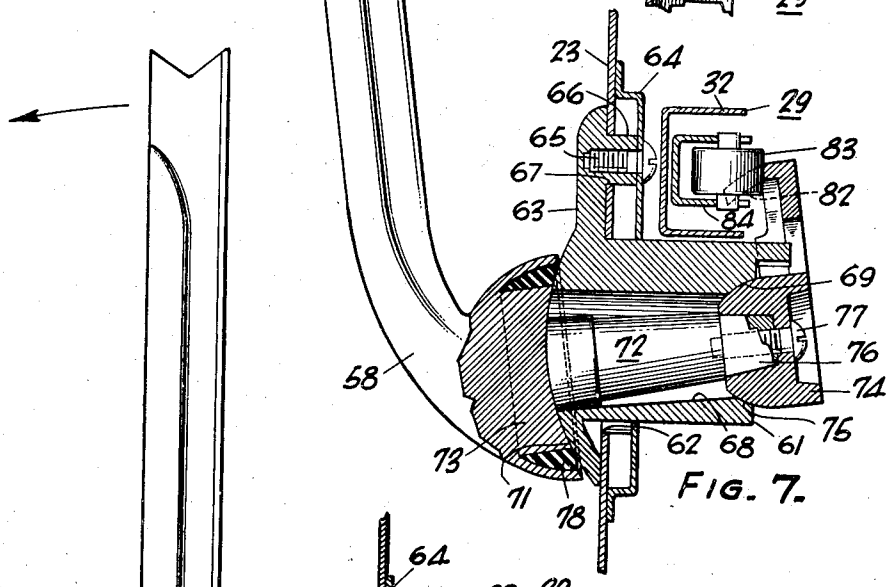

FIG. 7.

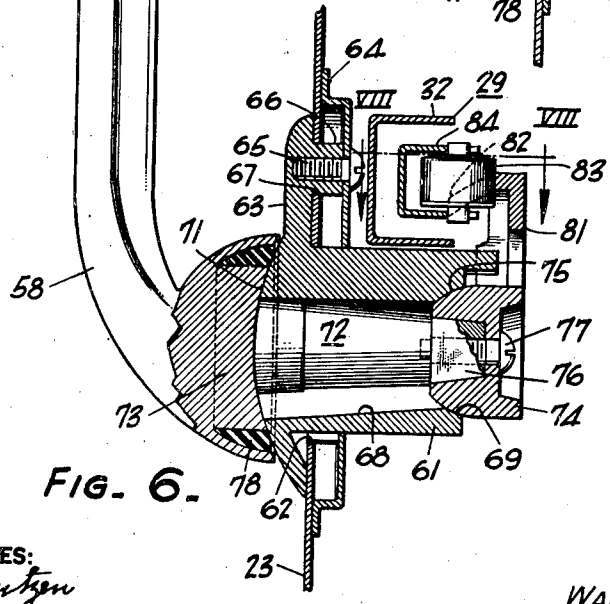

FIG. 6.

WITNESSES:

J. H. Leinbach

Andrew J. Cook

INVENTOR

WALTER PEGLOW

BY Walter Peglow

ATTORNEY

Patented Sept. 26, 1944

2,359,150

UNITED STATES PATENT OFFICE

2,359,150

LATCH CONSTRUCTION

Walter Peglow, Mansfield, Ohio, assignor to Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., a corporation of Pennsylvania

Application July 10, 1941, Serial No. 401,696

6 Claims. (Cl. 292—336)

This invention relates to a door latch and more especially to a door latch for a refrigerator.

One object of the invention is to provide a door latch mechanism adapted to extend through an opening in a wall and seal said opening.

Another object of the invention is to provide a latch-operating lever which extends through and effects a sealing engagement with a wall, which lever is adapted to move in a plurality of directions.

A further object of the invention is to provide an operating linkage for a door latch, which linkage is responsive to a plurality of movements of an operating lever.

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:

Fig. 1 is a perspective view of a domestic refrigerator cabinet embodying the invention;

Fig. 2 is a sectional view on the line II—II of Fig. 1;

Fig. 3 is an enlarged view of the mechanism of Fig. 1, but with the latch held in the retracted position and the trigger about to strike the latch keeper;

Fig. 4 is a sectional view of the latch keeper and of the latch and the trigger showing their relative position when the door is closed;

Fig. 5 is a rear view of the latch mechanism;

Fig. 6 is a sectional view taken on the line VI—VI of Fig. 3;

Fig. 7 is a view similar to Fig. 6, but with the lever tilted to retract the latch; and,

Fig. 8 is a sectional view on the line VIII—VIII of Fig. 6.

The structural features of the latch described in this application are also shown in the application of Martin G. Sateren, Serial No. 360,537, filed October 10, 1940, and assigned to the assignee of this invention.

Referring now more specifically to the drawings, the reference numeral 20 designates a refrigerator cabinet having a door 21 comprising an inner panel 22 and a metal outer shell 23 with turned edges 24. The edges of the inner panel 22 and the edges 24 of the outer shell 23 are joined together with screws 25 which also engage a sealing gasket 26 in place at the edges of the door 21. The door 21 is hinged adjacent a vertical edge of the refrigerator cabinet on hinges 27. The outer shell 23, together with the gasket 26 forms a vapor-tight structure to prevent air and the water vapor carried by it from entering the door structure when the door 21 is closed. If water vapor were permitted to enter the door structure when the door 21 is closed, it would condense on the cold surfaces of the inner structure of the door and the resulting moisture would cause rapid deterioration of these structures.

A trigger latch mechanism 29 is provided adjacent the edge of the door 21 opposite the hinges 27, and a latch keeper 31 is secured to the front face of the cabinet 20. The trigger latch mechanism 29 comprises a sheet metal casing 32 located between the inner panel 22 and the outer panel 23 of the door 21. The casing 32 has two outwardly-turned lugs 33 which are fastened by flush-headed bolts 34 to the edges 24 of the outer shell 23. Three pins 35, 36, and 37 are secured in the side walls of the casing 32 and span the interior thereof.

A latch member 38 comprising two spaced-apart and approximately V-shaped plates 39 is pivoted at one extremity of the legs of the plates 39 on the pin 36. The plates 39 are held in spaced relationship by a pin 41 and a second pin 42, which forms a bearing for a roller 43 located between the plates 39. Lugs 44 are formed on the latch 38 and a lug 45 is formed on the casing 32, which lugs 44 and 45, respectively, engage the ends of a compression spring 46 which biases the latch 38 for counterclockwise rotation, as viewed in Figs. 2 and 3.

A trigger 48 is pivoted on the pin 35 in the casing 32 and comprises a rectangular frame-like metal stamping, two opposite sides 49 of which are bent at right angles to the other two sides 50 and 51. The trigger 48 straddles the latch 38 and extends between the latch 38 and the casing 32. The two sides 49 of the trigger frame 48 are notched to provide shoulders 52 which engage two lugs 53 cut from the side plates 39 of the latch 38 and bent outwardly to lie at right angles thereto. The trigger 48 is biased by a coil spring 54 on the pin 35 in a clockwise direction, as viewed in Figs. 2 and 3. The lugs 53 and the shoulders 52 are so arranged that when the latch 38 is moved in a clockwise direction, as viewed in Figs. 2 and 3, the shoulders 52 will engage the lugs 53 on the latch 38 and hold the same against the bias of the compression spring 46.

The latch keeper 31 projects from the front edge of the cabinet, and an opening 56 is provided in the inner panel 22 of the door 21 adjacent the latch 38, which opening 56 receives

the latch keeper 31 when the door is closed. The portion of the keeper 31 which enters the opening 56 comprises a surface 57 slightly inclined to the front surface of the cabinet 20. The roller 43 engages the surface 57 of the keeper 31 when the door 21 is closed, and is forced along said surface by the compression spring 46 to bias the door 21 and its sealing gasket 26 into close engagement with the front surface of the cabinet 20, thereby slightly compressing the gasket 26.

The side 51 of the trigger 48 lies near the roller 43 when the latch 38 is retained by the trigger 48 in the retracted position. When the door 21 approaches its closed position on closing, the side 51 strikes the latch keeper 31, moves the trigger 48 in the counterclockwise direction as viewed in Figs. 2 and 3, and releases the latch 38 when the roller 43 is near the inclined surface 57 for engagement therewith.

The lever 58 is secured to the door 21 by a sleeve or bushing 61 which projects through an opening 62 in the outer shell 23 of the door 21. The sleeve 61 is attached to the outer shell 23 by a flange 63 overlying the outer surface of the shell 23 and by a cupped plate 64 on the inner side of the door shell 23, which plate 64 is fastened to the flange 63 by a screw 65 engaging a lug 66 on the flange 63 of the sleeve 61. The lug 66 projects through a second opening 67 in the outer shell 23. The sleeve 61 has a central horizontal bore 68, a concave spherical socket 69 at the inner opening of the bore 68, and a convex spherical bulge 71 adjacent the outer opening thereof and concentric with the spherical socket 69.

The lever 58 comprises an axis-like pin 72 extending through the bore 68 and a collar 73 which has a concave surface overlying the convex spherical bulge 71 on the outer surface of the sleeve 61. The lever 58 normally is in the erect position. The pin 72 projects from the central portion of the collar 73 into the central bore 68 of the sleeve 61, and a member 74 having a convex spherical surface 75 which cooperates with the concave spherical socket 69 is secured to the end of the pin 72 by a square mortise and tenon joint 76 and a screw 77.

The bore 68 in the sleeve 61 is oblong to provide for downwardly-pivoting action of the pin 72 on the socket 69 but the sides of the oblong bore 68 prevent a corresponding sidewardly-pivoting action. The lever 58 when pulled forwardly, pivots on the socket 69 and, when moved sidewardly, rotates on the axis of the pin 72.

A circular groove is formed on the concave surface of the collar 73 to accommodate a sealing gasket 78 consisting of a synthetic rubber such for example as that known by the trade name "neoprene." The sealing gasket 78 is oil-resistant, so that the engagement between the convex bulge 71 and the concave collar 73 may be lubricated to render the engagement vapor-tight and to prevent friction. A second vapor-tight joint is formed between the sleeve 61 and the member 74, the ball and socket engagement between these two members being rendered vapor-tight by a lubricant. The joints between the flange 63 of the sleeve 61 and the outer shell 23 of the door 21 are likewise rendered vapor-tight by a suitable sealing compound (not shown), so that the entire assemblage of the latch mechanism on the outer shell 23 is vapor-tight as regards the passage of vapors through the openings 62 and 67 in the outer shell 23. This is essential in order to prevent moist air from the exterior of the refrigerator from entering the space between the inner panel 22 and the outer shell 23, the moisture of which air would condense on the cool surfaces in the interior of the door 21.

The operative connection between the lever 58 and the latch 38 is as follows: The member 74 comprises an upwardly-extending arm 81 and an inwardly-facing cam 82 on the upper end thereof, which cam 82 straddles a roller 83. The roller 83 is pivoted in a latch-retracting lever 84 at approximately its mid point. The lever 84 is pivoted at one end on the pin 37, and, at its other end, engages the pin 41 on the latch 38. The lever is biased for clockwise rotation, as viewed in Figs. 2 and 3, by a spring 86 on the pin 37.

The latch 38 may be retracted by pulling the lever 58 forwardly and/or sidewardly. The forward pull on the lever 58 causes the lever 58, the pin 72 and the cam 82 to pivot on the socket 69 and the cam 82 forces the roller 83 into the casing 32. This movement of the roller 83 causes the latch-retracting lever 84 to rotate in the counterclockwise direction, as viewed in Figs. 2 and 3, and engage the pin 41 to force the latch 38 to pivot on the pin 36 in a clockwise direction, as viewed in Figs. 2 and 3, thereby disengaging the roller 43 from the latch keeper 31. This action is best illustrated by Fig. 7.

It will be apparent from Figs. 3, 5, and 8 that a sideward pull on the lever 58 in either direction depresses the lever 84 in the same manner as when the lever 58 is pulled forwardly. A sideward pull on the lever 58 rotates the pin 72 on its axis and moves the cam 82 sidewardly so that either of the two inclines 87 of the cam 82 depress the roller 83 which in turn depresses the lever 84.

It will be evident from the above description that this invention provides a door latch mechanism which is adapted to extend through an opening in a wall and seal said opening against the passage of vapors therethrough. The invention further provides an operative connection between a latch and a lever whereby the latch may be actuated by a plurality of movements of the lever.

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

What I claim is:

1. In a latch mechanism for a door, the combination of a sleeve adapted to extend through a wall of said door and effect a vapor-tight joint with said wall, said sleeve having an opening extending therethrough, a concave spherical surface on said sleeve at one end of said opening, a convex spherical surface concentric with said concave spherical surface on said sleeve at the other end of said opening, a pin extending through said opening, a collar on said pin providing a concave spherical surface contiguous with said convex spherical surface of said sleeve, a knob on said pin providing a convex spherical surface contiguous with said concave spherical surface of said sleeve, said contiguous surfaces, said pin, and the opening in said sleeve being formed to afford tilting of said pin in one plane, at least one of said spherical surfaces forming

a vapor-tight seal with the spherical surface contiguous therewith.

2. In a latch mechanism for a door, the combination of a sleeve adapted to extend through a wall of said door and effect a vapor-tight joint with said wall, said sleeve having an opening extending therethrough, a concave spherical surface on said sleeve at one end of said opening, a convex spherical surface concentric with said concave spherical surface on said sleeve at the other end of said opening, a pin extending through said opening, a collar on said pin providing a concave spherical surface contiguous with said convex spherical surface of said sleeve, a knob on said pin providing a convex spherical surface contiguous with said concave spherical surface of said sleeve, said contiguous surfaces, said pin, and the opening in said sleeve being formed to afford rotation of said pin and tilting thereof in one plane, at least one of said spherical surfaces forming a vapor-tight seal with the spherical surface contiguous therewith.

3. In a latch mechanism for a door, the combination of a sleeve adapted to extend through a wall of said door and effect a vapor-tight joint with said wall, said sleeve having an opening extending therethrough, a concave spherical surface on said sleeve at one end of said opening, a convex spherical surface concentric with said concave spherical surface on said sleeve at the other end of said opening, a pin extending through said opening, a collar on said pin providing a concave spherical surface contiguous with said convex spherical surface of said sleeve, a knob on said pin providing a convex spherical surface contiguous with said concave spherical surface of said sleeve, said contiguous surfaces, said pin, and the opening in said sleeve being formed to afford rotation of said pin and tilting thereof in one plane, at least one of said spherical surfaces forming a vapor-tight seal circumferentially of said pin with the spherical surface contiguous therewith.

4. In a latch mechanism for a door, the combination of a sleeve adapted to extend through a wall of said door and effect a vapor-tight joint with said wall, said sleeve having an opening extending therethrough, a concave spherical surface on said sleeve at one end of said opening, a convex spherical surface concentric with said concave spherical surface on said sleeve at the other end of said opening, a pin extending through said opening, a collar on said pin providing a concave spherical surface contiguous with said convex spherical surface of said sleeve, a knob on said pin providing a convex spherical surface contiguous with said concave spherical surface of said sleeve, said contiguous surfaces, said pin, and the opening in said sleeve being formed to afford rotation of said pin and tilting thereof in one plane, and a ring-shaped gasket at the concave spherical surface of said collar and contacting the concave spherical surface of said sleeve to provide a vapor-tight seal between said pin and said sleeve circumferentially of said pin.

5. In a latch mechanism for a door, the combination of a sleeve adapted to extend through a wall of said door and effect a vapor-tight joint with said wall, said sleeve having an opening extending therethrough, a concave spherical surface on said sleeve at one end of said opening, a convex spherical surface concentric with said concave spherical surface on said sleeve at the other end of said opening, a pin extending through said opening, a collar on said pin providing a concave spherical surface contiguous with said convex spherical surface of said sleeve, a knob on said pin providing a convex spherical surface contiguous with said concave spherical surface of said sleeve, said contiguous surfaces, said pin, and the opening in said sleeve being formed to afford rotation of said pin and tilting thereof in one plane, and a ring-shaped gasket adjacent one of said spherical surfaces and contacting a spherical surface contiguous thereto circumferentially of said pin to effect a fluid-tight seal therewith.

6. In a latch for a door having inner and outer walls, the combination of a sleeve extending through the outer wall of said door and effecting a vapor-proof joint with said wall, said sleeve having an opening extending therethrough, a concave spherical surface on said sleeve at one end of said opening, a convex spherical surface concentric with said concave spherical surface on said sleeve at the other end of said opening, a pin extending through said opening, a collar on said pin providing a concave spherical surface contiguous with said convex spherical surface of said sleeve, a knob on said pin providing a convex spherical surface contiguous with said concave spherical surface of said sleeve, said contiguous surfaces, said pin, and the opening in said sleeve being formed to permit rotation of said pin and tilting thereof in one plane, at least one of said spherical surfaces forming a vapor-tight seal circumferentially of said pin with the spherical surface cooperating therewith.

WALTER PEGLOW.