July 11, 1961 B. A. CARIDEO 2,991,904

COVER VENTING MEANS AND LOCK

Filed Feb. 5, 1960

Fig. 1.

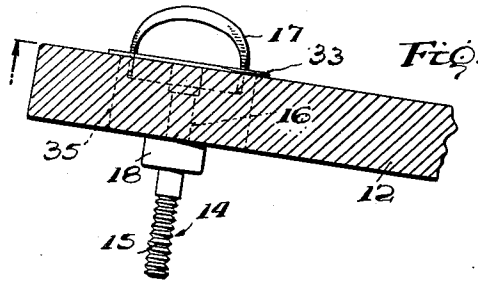


Fig. 2.

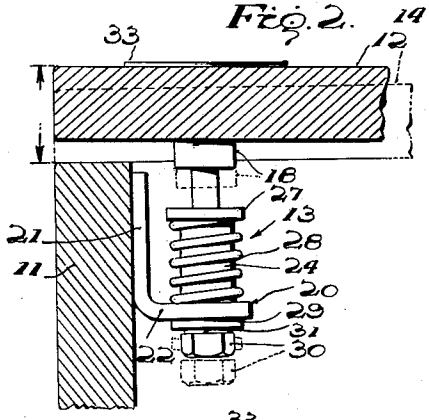


Fig. 3.

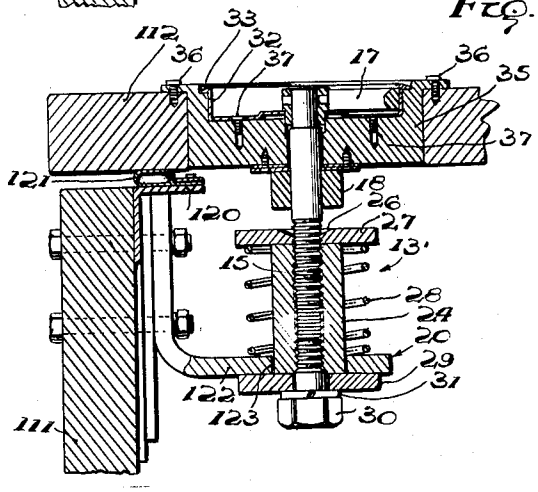


Fig. 4.

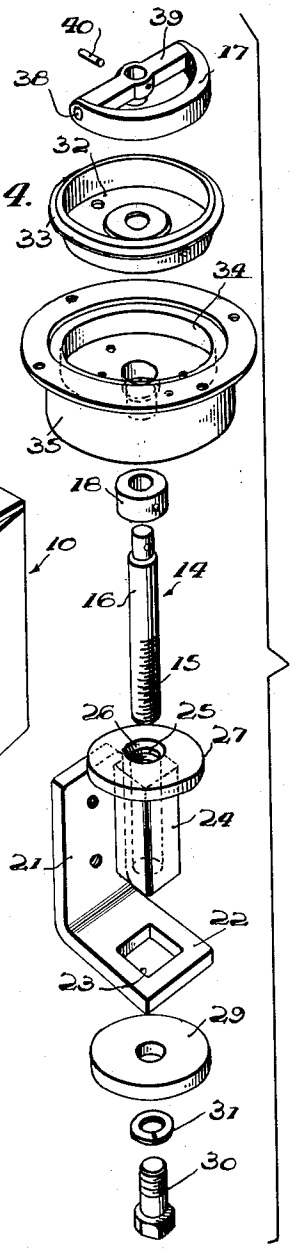
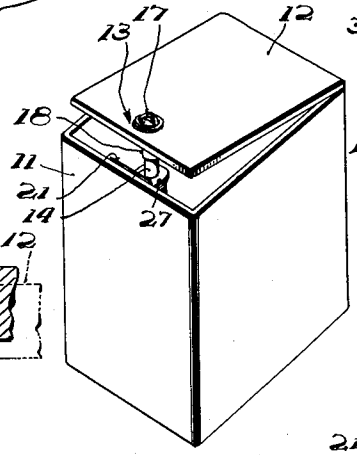


Fig. 5.



INVENTOR

Blaise A. Carideo.

BY W. J. Eccleston.

ATTORNEY

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COVER VENTING MEANS AND LOCK

Blaise Alfred Carideo, Natick, Mass., assignor to the United States of America as represented by the Secretary of the Army

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12 Claims. (Cl. 220—44)
(Granted under Title 35, U.S. Code (1952), sec. 266)

The invention described herein, if patented, may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

The invention relates to means for securing a closure for a container in any of a variety of positions ranging from a closed position to any of a plurality of partially open or venting positions. While the invention undoubtedly has other uses, it is particularly useful in connection with a proofing cabinet for bread dough. Such cabinets must be vented to a greater or lesser degree which can readily be determined by temperature, humidity or the type of dough being proofed. Moreover, such venting openings must be extremely accurate to permit an infinite range of openings from almost imperceptible cracks to relatively wide and readily discernable openings. Such a range of adjustments can be achieved by cams or screw-threaded means. Prior devices had the disadvantage that the closure once it had been pre-set to a selected venting position could not be temporarily closed without destroying the pre-setting and requiring re-setting when once more opened. Also, a slightly open closure and/or the venting means might well be damaged if accidently struck. Most proofing cabinets provide the venting closure in the front of a hinged lid for the cabinet which when imperceptibly open to a venting position might have a heavy load applied thereto so as to damage the parts. Also, cams and screws used alone are susceptible to backlash whereby it is difficult to achieve an accurate pre-setting.

With the foregoing in view, it is an object of the invention to provide improved means for securing a closure in any of a range of positions from a closed position to any of a plurality of partially open or venting positions.

A further object is to provide such a means which includes resilient means which yieldably secures the closure in each partially open position but which permits temporary closing of said closure under pressure and causes the closure to return to the pre-set position upon removal of the pressure.

Other objects and advantages reside in the particular structure of the invention, the structure of the several elements of the same, combinations and subcombinations of said elements with each other and/or with a container and a closure for a container opening, all of which will be readily apparent to those skilled in the art upon reference to the attached drawing which illustrates one embodiment of the invention and to the following specification wherein the invention is described and claimed.

In the drawing:

FIGURE 1 is a fragmentary vertical sectional view showing the venting connection with the parts in the separated position;

FIGURE 2 is a like view but showing the parts in one of the venting positions;

FIGURE 3 is a fragmentary diametrical vertical sectional view of a slightly modified form of the venting connection, the parts being shown in the closed position;

FIGURE 4 is an exploded perspective view of the several parts of the venting connection of FIGURE 3; and

FIGURE 5 is a perspective view on a reduced scale of a container having the venting connection of the invention applied thereto, the parts being shown in one venting position.

Referring specifically to the drawing wherein like reference characters designate like parts in all views, and referring at first to FIGURE 5, 10 designates generally any suitable container which may be a dough proofing cabinet of any suitable form. The cabinet 10 includes a front wall 11 and a lid or closure 12 for the top opening. Lid 12 is hinged to the container at the rear by any suitable hinge means, not shown. The lid 12 is secured in the closed position or in any of a plurality of partially open or venting positions by the novel venting means 13 now to be described.

The venting means or venting connection 13 comprises a bolt 14 which includes a screw-threaded lower end 15 and an unthreaded upper portion 16. Such unthreaded upper portion is rotatably mounted in the lid or closure 12 in any suitable manner as by being lightly clamped between the handle 17 which is pivotally secured to the upper end of the bolt and a collar 18 which is pinned or otherwise secured to the bolt. This arrangement allows the threaded lower end 15 of the bolt 14 to project below the lid 12 and into the container 10 whenever the lid is entirely closed or is in any of the venting positions. Handle 17 arises from a flush cup 33 having a handle-receiving recess 32. Flush cup 33, in turn, may be seated in a recess 34 of a handle retainer 35 and secured thereto by screws 37. Retainer 35 is secured in an opening through the lid 12 in any suitable manner as by the screws 36. Obviously, the handle could be mounted in other ways. The opposite ends of the handle 17 are pivoted by pivots 38 to opposite ends of a cross piece 39 which, in turn is fixed to the upper end of bolt 14 by pin 40. When the parts are in the FIGURE 1 position, the lid 12 may be fully opened to permit access to the interior of the container 10 or it may be lowered to the closed position or any of the venting positions where it is normally connected to a keeper 20, now to be described.

The keeper 20, in the embodiment illustrated, comprises an L-shaped bracket comprising a leg 21 and a foot 22. Leg 21 is secured to the interior of the front wall 11 by any suitable fastener means such as wood or like screws, not shown, so that the foot 22 projects substantially horizontally therefrom and in alignment with the bolt 14 as the latter moves with the lid 12 to the closed or venting positions. Foot 22 is formed with a non-circular opening 23 therethrough. Such opening 23 is complementary to the cross sectional shape of a stem 24 of a bolt keeper which has a loose sliding fit therein. Stem 24 has an interiorly screw-threaded bore 25 the upper end of which is preferably formed with an enlargement or countersink 26 to facilitate the entry of the lower end 15 of the bolt 14. The upper end of the stem 24 is formed with an annular flange or like means 27 which provides an upper stop or abutment for a coil spring 28 which surrounds the stem 24. The foot 22 provides a bottom stop or abutment for the spring 28 whereby the latter maintains the stem 24 in an elevated position. At the same time, the spring 28 permits the stem 24 to slide downwardly relative to the foot 22 to the limit of the spring's compression. Upward movement of the stem 24 relative to the foot 22 is limited by a removable stop washer 29 which seats on the stem 24 below the foot 22 and which is secured in place by any suitable means such as the screw bolt 30 which is threaded into the lower end of the bore 25 and secured therein by the lock washer 31.

In operation, as the lid is lowered, the lower end 15 of the bolt 14 is guided into the bore 25 of stem 24 by the

countersink 26. Bolt 14 is now rotated by its handle 17 to establish a threaded connection between the former and the stem 24. It should be noted that the aforesaid loose sliding fit of stem 24 in opening 23 permits the former to tilt enough to receive the bolt 14 and to gradually straighten up as the bolt is turned down. When the bolt is screwed down to the limit, as shown in FIGURE 2 in broken lines, the lid 12 is secured in the closed position. However, to vent the container 10, bolt 14 is backed off any suitable number of turns or part turns to elevate lid 12 to any of an infinite number of venting positions, as the position shown in full lines in FIGURE 2. As handle 17 is pivoted to the cross piece 39 it may now be lowered into its recess 32 of the flush cup 33 to provide a substantially flush surface on the lid 12. Thus, if force or a load such as a dough pan or the like is temporarily laid atop the lid 12 the latter merely closes to the closed position against the action of spring 28. The latter returns the lid to the proper venting position as soon as the load or force is lifted. No re-setting of the venting connection is necessary.

In the slight modification of FIGURE 3, the foot 122 of the keeper mount is elongated somewhat and the front wall 111 is provided with a bracket 120 on which is mounted any suitable gasket 121 which enables the lid 112 to form a hermetic seal when the bolt 14 is turned down to the fully closed position shown.

From the foregoing, it is obvious that the invention is capable of positively locking the lids 12 and 112 in the fully closed positions and may also pre-set the same in any of an infinite number of venting positions. When in the last named positions, the lids may be temporarily forced closed without damage to the parts and without altering the pre-set venting position to which the lids return as soon as the same are released. The spring 28 absorbs any backlash which might arise from a simple threaded connection or cam arrangement whereby extremely accurate setting in accordance with existing temperature, humidity conditions and/or according to the requirements of the type of dough being proofed. Also, it is apparent that the invention is readily applicable to standard containers without any difficult or expensive modification thereof. In this connection it is understood that an operator knows in advance the size opening created by each reverse turn or part turn of bolt 14. Also, if desired a scale or instruction sheet (not shown) may be associated with the lids 12 or 112 to guide the user.

Moreover, while there has been shown and described what are now considered to be the preferred embodiments of the invention, it is understood that the same is susceptible of other forms and expressions. Thus, the invention is not considered as being limited to the precise structures shown and described hereinabove but only as hereinafter claimed.

I claim:

1. The combination with a container including a cover, lid or the like capable of being opened and closed; of a combined lock and venting means for said cover, said venting means comprising at least one bolt carried by said cover and extending inwardly of said container, a keeper for said bolt carried by said container and movable relative thereto axially of said bolt, said keeper lockingly receiving said bolt in any of a plurality of locking positions, said locking positions securing said cover in a range of positions from a fully closed position through a plurality of partially open venting positions, resilient means mounting said keeper, and said resilient means being yieldable inwardly of said container axially of said bolt to permit the cover to be temporarily closed against the action of said resilient means when said cover is in any of said venting positions without changing the locking position of said bolt relative to said keeper.

2. The combination of claim 1, wherein said bolt is screw-threaded and wherein said keeper is complementarily screw-threaded.

3. The combination of a container including a cover, or the like capable of being opened and closed; of a combined locking and venting means for said cover, said venting means comprising a screw-threaded bolt rotatably mounted on said cover and extending inwardly thereof, a screw-threaded keeper complementary to said bolt for threadedly receiving the same, a keeper mount fixed to said container inwardly thereof, means mounting said keeper on said mount for sliding movement relative thereto axially of said bolt, spring means operatively associated with said mount and keeper and normally holding said keeper in an elevated position, said bolt being threaded into said keeper an infinite number of distances to provide a range of positions for said cover from a fully closed position to an infinite number of venting positions, and said spring means permitting said cover to be temporarily fully closed against the action of said spring from any of said venting positions.

4. The combination of claim 3, wherein said keeper is non-circular in cross section, and said keeper mount being formed with a non-circular opening therethrough slidably receiving said keeper therein.

5. The combination of claim 4, wherein said keeper includes upper and lower stop means above and below said keeper mount limiting said sliding movement of said keeper relative to said keeper mount.

6. The combination of claim 5, wherein said spring means comprises a coil spring encircling said keeper between said upper stop and said keeper mount.

7. The combination with a container including a venting opening and a closure for the same, there being means mounting said closure on said container for movement from a closed position to any of a plurality of venting positions; of a venting means for said closure; said venting means including a connection between said closure and container, said connection being pre-settable in any of a range of positions from said closed position to any of a plurality of venting positions, said connection including spring means holding said closure in each selected venting position, said closure being freely movable from any selected venting position to said closed position against the action of said spring means, said spring means comprising means automatically operative to return said closure toward said selected pre-set position, and said connection including stop means preventing return movement of said closure past said selected pre-set position.

8. The combination of claim 7, wherein said connection comprises a screw-threaded element carried by said closure, a complementary screw-threaded element connectable therewith and carried by said container, and said spring means being operatively connected to one of said screw-threaded elements.

9. The combination of claim 8, wherein said spring means is operatively connected to said screw-threaded element carried by said container.

10. The combination of claim 9, wherein said container includes means mounting said last named screw-threaded element for sliding movement axially of the same.

11. The combination with a container including a venting opening and a closure for the same, there being means mounting said closure on said container for movement from a closed position to any of a plurality of venting positions; of a venting means for said closure said venting means including pre-set means for setting said closure at any selected venting position, said venting means including resilient means resiliently holding said closure in any pre-set venting position, said closure being freely movable under a load from any selected venting position to said closed position against the action of said resilient means, said resilient means comprising means automatically returning said closure toward said pre-set position upon removal of said load, and said pre-set means

including means limiting the return movement of said closure to said pre-set position.

12. The combination with a container including a venting opening and a closure for the same, there being means mounting said closure on said container for movement from a closed position to any of a plurality of venting positions; of a venting means for said closure, said venting means including a screw threaded connection between said closure and container, said connection being threadedly pre-settable in any of a range of positions from said closed position to any of a plurality of venting positions, said connection including spring means holding said closure in each selected venting position, said connection as a whole being freely movable with said closure against the action of said spring means as said closure moves from any selected venting position to said closed position, said spring means comprising means operative

automatically to return said closure and connection toward said pre-set venting position, and stop means preventing return movement of said closure past said pre-set venting position.

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