May 3, 1949. W. B. JOHNSON 2,468,758

RETAINING MEANS FOR CLOSURE CAPS

Filed Oct. 11, 1944

Fig. 1

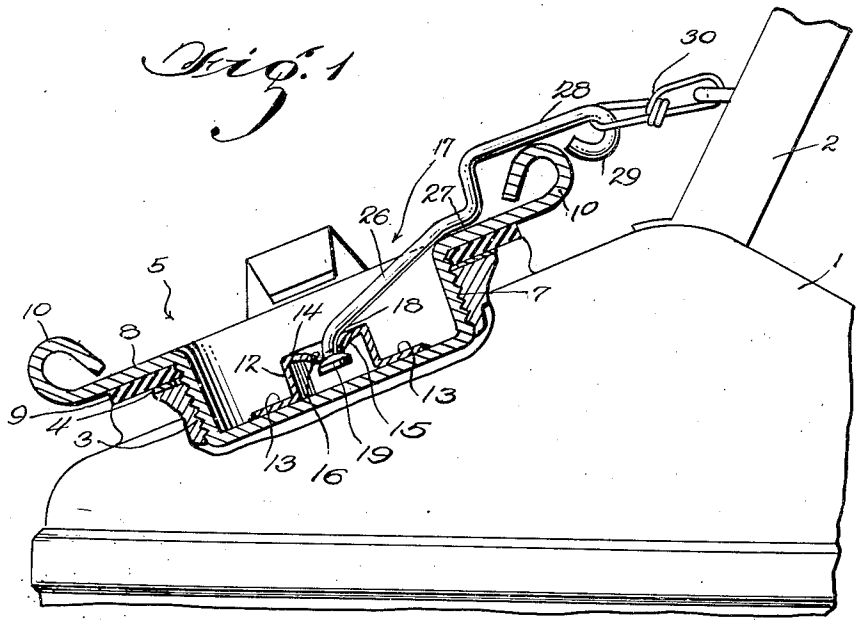


Fig. 2

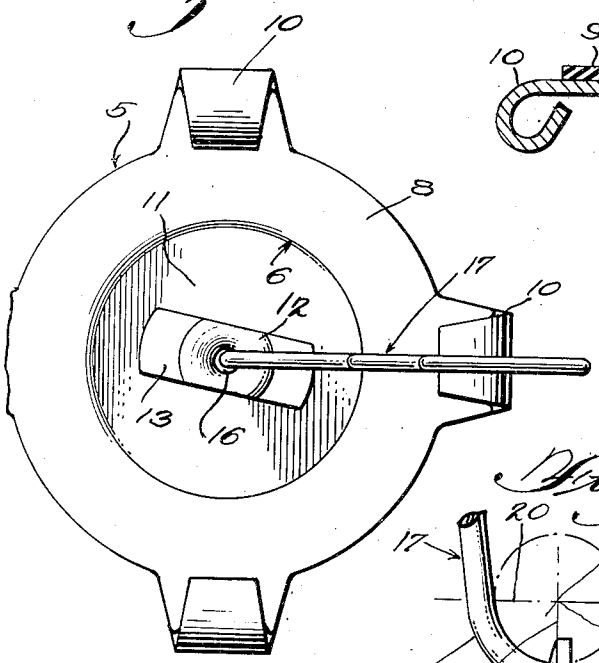


Fig. 3

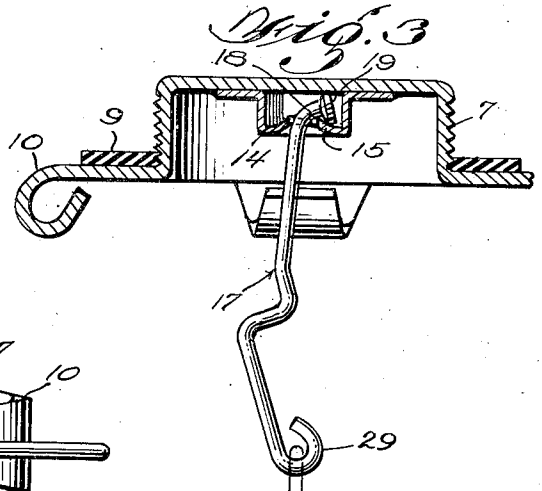
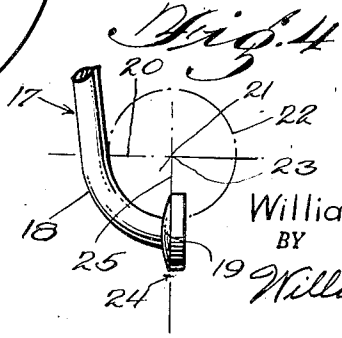


Fig. 4



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RETAINING MEANS FOR CLOSURE CAPS

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2 Claims. (Cl. 220—38.5)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

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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.

This invention relates to closure members, and more particularly has reference to retaining means for the closure. The construction is especially well adapted for use with portable containers of the type being used by the armed forces.

The present device is generally similar to the cap retainer disclosed in Patent No. 2,322,805 granted to me on June 29, 1943, but embodies novel features not shown in the patent. Of course, the primary purpose of the above patent and this invention is to provide a closure cap with retaining means which will not interfere with the rotation of the cap in either clockwise or counterclockwise direction. While the patented structure achieved the desired results, I have been able to devise a retaining means which is universally swivelled to the cap thereby giving a structure which will not bind in any position, and at the same time will not be damaged when used as a carrying medium if the cap is removed fully from the container. I have determined that no binding will occur if the curve of the retaining link begins at a radial line forming a quadrant of the circle and if the inner face of the head coincides with a radial line defining the other extremity of the quadrant. In this way, I provide a true arc and there will be no straight portions at the joint which was true in the prior construction.

One object of the present invention is to provide retaining means for closure caps which will enable the cap to be easily and readily rotated.

An object of the invention is to provide a closure member or cap having projections with retaining means secured to the closure in such a manner as to clear the projections and permit rotation of the closure in either direction.

A further object is to provide retaining means for closure caps which is simple in construction and operation and which can be manufactured inexpensively.

To accomplish the above and other objects, the invention comprises a link having a curve at its inner end terminating in an enlarged head adapted to be mounted in a socket on the closure cap for universal movement. One terminal of the curved area is defined by a radial line forming a quadrant of a circle, and the other terminal being the inner face of the enlarged head which coincides with a radial line defining the other extremity of the quadrant. The outer or free end of the link is removably attached to the container to prevent the loss of the cap.

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With the foregoing and other advantageous objects in view, the present invention consists in the construction, combination and arrangement of elements as will be more fully hereinafter set forth as shown in the attached drawings and finally enumerated in the attached claims.

Attention is invited to the accompanying drawings forming a part of this specification in which like reference numerals designate the same or similar parts throughout the several views in which:

Figure 1 is a transverse sectional view of a closure cap having incorporated therewith my novel cap retaining means.

Figure 2 is a top plan view of the cap shown in Figure 1.

Figure 3 is a transverse sectional view of the cap illustrating the manner in which the cap retaining means may be used to carry an article.

Figure 4 is a diagrammatic representation showing the area of the curved portion of the retaining link where it joins the enlarged head.

Referring to Figure 1, there is shown a container 1 having handle 2, and an internally threaded filling aperture 3 surrounded by an annular sealing flange 4. The aperture 3 is closed by a cap 5 having a body 6 provided with an externally threaded portion 7 for engaging the threads in the aperture. An annular sealing flange 8 surrounds the body and a resilient gasket 9 is adapted to be held between the flanges 8 and 4 to seal the filling aperture. A plurality of projections or lugs 10 extending above or out of the plane of the upper face of the body are provided on the outer circumference of the flange 8. The construction and purpose of the projections have been fully set forth in my co-pending application, Serial No. 558,235, filed October 11, 1944.

It will be noted that the body 6 is formed with a well 11, and a housing 12 is secured to the bottom of the well by flanges 13 in any convenient manner. Cover 14 of the housing 12 has an annular wall 15 which forms a circular central aperture 16; annular wall 15 is turned down-

wardly and terminates in spaced relation to body 6, thus forming an annular flanged bearing surface for the component parts of the retainer link 17 about to be described in greater detail.

A retainer link indicated generally 17 has a curved area 18 and an enlarged head 19 at its inner end. The head 19 is adapted to extend into the housing 12 through the central aperture 16, and the diameter of the aperture while greater than that of the link 17 is less than the diameter of the head 19. As heretofore referred to, the curved area 18 is an important feature, and attention is invited to Figure 4. The curve 18 begins at a radial line 20 forming quadrant 21 of a circle 22 whose center is at 23. Inner face 24 of head 19 coincides with a radial line 25 defining the other extremity of the quadrant. Thus, it will be seen that the curved area 18 is a true arc and there are no straight lines to cause the link 17 to bind in the housing. The link and the downwardly turned portion 15 in the housing provide a universal swivel thereby enabling the link to rotate freely about its horizontal and vertical axes.

In a specific embodiment of the invention, as illustrated in the accompanying drawings, the inner surface 14 of cover 12 is concavely curved, and enlarged head 19 of link 17 is convexly curved; in such an arrangement, the inner surface of the cover provides a bearing surface on which the head may slide and pivot with a minimum of friction.

A substantially straight portion 26 extends outwardly and upwardly from the curved area 18 in a plane slightly below the upper surface of the body 5. The link is bent downwardly to form a contact section 27 which engages the flange 8 as shown in Figure 1. The link is then offset upwardly and outwardly as at 28 to clear each of the lugs or projections 10. The outer end of the link is formed with a hook-like member 29 and one end of a flexible connection 30 engages the hook while the other is attached to the handle 2 to anchor the cap to the container.

It will be appreciated that the cap may be readily rotated, and by virtue of the swivel connection between the link and the cap, the link will in no way interfere with the manipulation of the cap. The closure may be rotated by turning the lugs with the fingers or if a tool is available, it may be placed to contact opposed lugs and by giving a quick turn, the cap may be spun.

Another important feature is to enable the cap to be used to carry various types of articles. To accomplish this purpose, the cap is removed from the filling aperture and the flexible connection disengaged from the hook 29. By inverting the cap, the body 5 will provide a hand-gripping means and the article to be carried may be engaged with the hook 29. The link 17 is free to have movement relative to the cap due to its swivel connection, and the advantage of this arrangement is obvious.

It will be fully understood that the foregoing description and accompanying drawings cover only the general and preferred embodiment of the invention and that various changes in construction, proportion and arrangement of the elements may be made by those skilled in the art without departing from the spirit and scope of the invention as set forth in the appended claims.

I claim:

1. A closure cap for sealing the filling opening of a container, said closure cap comprising a body portion, one side of said body portion being adapted to engage said filling opening, a housing carried by the opposite side of said body portion, said housing having a circular central aperture, and the annular wall forming said aperture being turned downwardly and terminating in spaced relation to said body portion, and forming an annular flanged bearing surface, a retaining link pivotally connected to said housing through said aperture, said retaining link having an enlarged head positioned inside said housing, and said retaining link also having proximate said enlarged head a curved portion defining a turn substantially a quadrant of a circle, said head and said curved portion of said link contacting said flanged bearing surface and permitting universal swiveling movement of said link relative to said housing.

2. A closure cap for sealing the filling opening of a container, said closure cap comprising a body portion, one side of said body portion being adapted to engage said filling opening, a housing carried by the opposite side of said body portion, said housing having a circular central aperture, and the annular wall forming said aperture being turned downwardly and terminating in spaced relation to said body portion, and forming an annular flanged bearing surface, a retaining link pivotally connected to said housing through said aperture, said retaining link having an enlarged head having a convexly shaped surface portion positioned inside said housing, and said retaining link also having proximate said enlarged head a curved portion defining a turn substantially a quadrant of a circle, said convexly shaped portion of said head and said curved portion of said link contacting said flanged bearing surface and permitting universal swiveling movement of said link relative to said housing.

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