June 29, 1943. W. B. JOHNSON 2,322,805

CAP RETAINER

Filed Oct. 29, 1941

Fig. 1

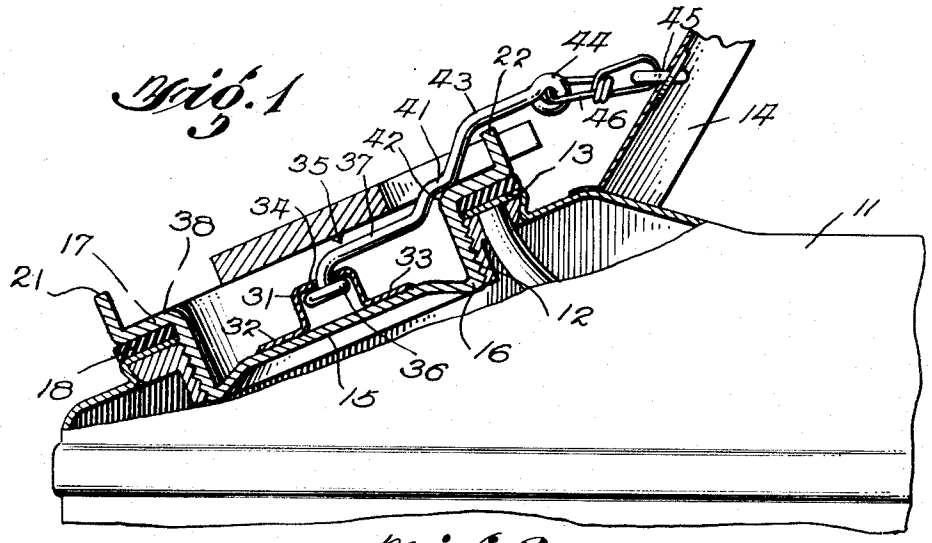
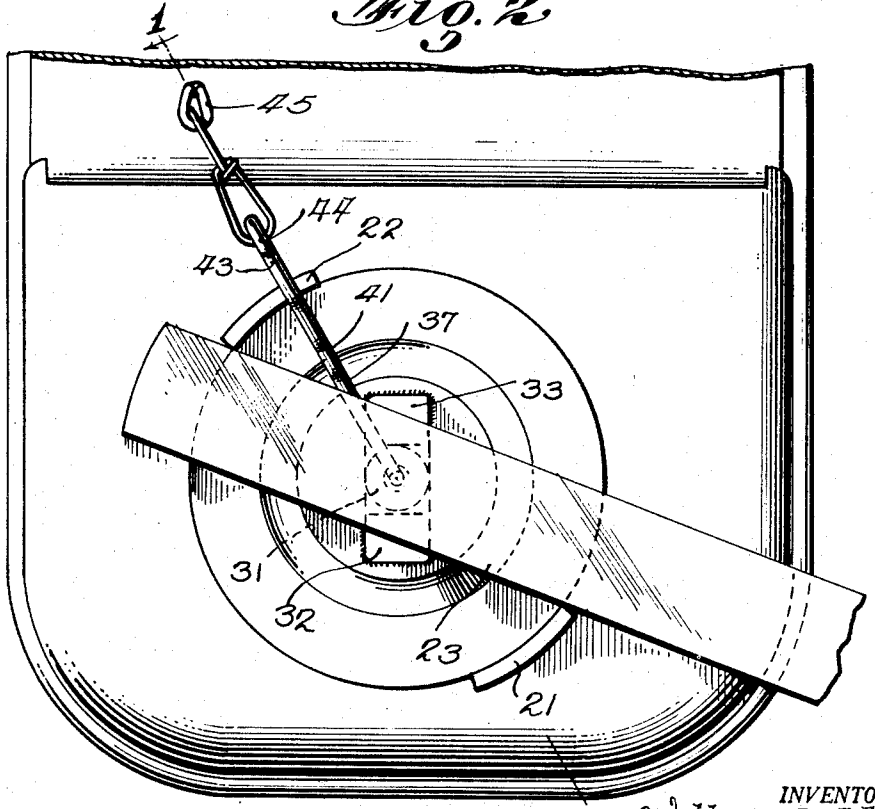


Fig. 2



INVENTOR.
William B. Johnson

BY

Wm. F. Doyle ATTY.

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CAP RETAINER

William B. Johnson, United States Army

Application October 29, 1941, Serial No. 416,940

1 Claim. (Cl. 220—39)

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

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

The present invention relates to closure caps for portable containers, and more particularly to a novel and improved cap retainer.

Before going into an explanation of the details of the structure of the device illustrated in the drawing, it is believed to be pertinent to point out that in modern military operations the use of large stationary or movable gasoline tanks in combat operations is frowned on for the reason that any large container becomes an obvious target for enemy aircraft or artillery bombardment. It is the present preferred military practice to refuel tanks, aircraft or other combat vehicles from relatively small metal containers shipped into the battle zone by truckloads, and of such size and shape that they may be easily concealed in locations spaced apart from each other so that, even if some of the containers are struck and the fuel is ignited, the entire fuel supply will not be lost. These individual containers are filled from larger tanks or tank cars well back of the zone of combat and after being emptied in the refueling operations in the field are returned behind lines for subsequent refilling.

In view of the tremendous quantities of gasoline utilized in modern military operations, it will be obvious that thousands of such small containers must be filled in every maneuver of substantial size, and it follows, of course, that it is extremely important to provide means whereby the caps of the containers may be removed or replaced almost instantaneously. It should not be overlooked, however, that the rough treatment and abuse that such containers will necessarily receive prevents the use of any structure except the most rugged and simple available. In fact, it has been considered impractical to supply any type of clip or snap closure, and it is believed that a screw threaded closure cap arranged to positively clamp into tight engagement with the sealing gasket is the only mechanical structure of sufficiently well recognized merit and reliability to be capable of meeting military specifications.

It is also regarded as essential to provide tightening lugs on the outer flanges of the closure cap which project upwardly above the cap surface a considerable distance so that they may be instantly engaged by any convenient type of tool, for example, a flat metal bar, a wrench handle, a piece of board, hammer or any other type of tool which may be available. In this connection it may be pointed out that structures having inset lugs requiring special spanner wrenches, etc., are regarded as entirely impractical, since the special tools are not apt to be available in the field.

It is regarded as essential, however, that the caps be provided with some effective type of anchor or retainer, since otherwise the container caps would undoubtedly be lost in fueling operations under battle conditions and if replacement caps were not immediately available the containers would be useless.

It has been recognized throughout the prior art that it is desirable in the case of portable containers, such as gasoline cans, for example, to provide the closure cap with some type of a cap anchor or retainer so as to prevent loss of the cap and also to avoid the necessity of replacing the cap in position on the container when the container is empty. It has also been recognized in the prior art that it is highly advantageous and convenient to provide the closure cap of the portable container with outwardly projecting lugs to facilitate manual opening or closing of the cap and so arranged that a straight bar or other tool might be used as a wrench to exert a comparatively large force on the cap in the opening or closing operations. So far as is known to this applicant, however, the desirable features of the two different constructions, hereinbefore pointed out, have been regarded as more or less inconsistent, since whenever any of the conventional chains or link retainer systems of the prior art have been associated with a cap having projecting lugs there has been undesirable interference between the two structures. For example, if an ordinary cap including a pair of projecting lugs is anchored by chain secured at its center, the chain will fall into the path of the lugs of the cap and will interrupt the rotation thereof, with the result that in order to successfully operate the device it is necessary for the operator to lift the chain with one hand and hold it out of the path of the lugs, so that he may spin the container cap with the other hand.

It is, therefore, the primary object of this invention to provide a closure cap for a portable container including a pair of projecting tightening lugs and having a cap retainer secured to such closure cap and arranged to avoid interference with the projecting lugs.

Another object of the invention is to provide a container closure cap including projecting lugs mounted in the exterior portions of the container cap and having a retaining link connected at the

center of the cap by a pivotal connection and offset to extend over and above the projecting lugs and thus permit free and unlimited movement of said projecting lugs in either direction without interference from the retaining link.

A further object of the invention is to provide a closure cap including an annular flange surface having upwardly projecting lugs and a central cavity including a pivotal anchor connection or a retaining link and a retaining link secured thereto, the arrangement being such that a flat wrench bar or other tool may be positioned across the plane top surface of the closure cap to engage both of the tightening lugs on opposite sides without interference from the retaining link.

A further object of the invention is to provide a closure cap retainer, as described above, of simple construction, adapted to economical methods of manufacture and of such design and construction as to be rugged in use and not subject to accidental damage.

The foregoing objects of the present invention are accomplished in the present instance by the provision of a retainer including a single offset link, pivoted in the center of the closure cap and having an offset portion arranged to extend upwardly above the path of movement of the projecting lugs, so that the cap can be spun in either direction without interference from the cap retaining member.

Referring now more particularly to the drawing,

Fig. 1 is a central sectional view of the present preferred embodiment of the invention as developed for military use by engineering experts of the United States Army and as adopted for army use. It is taken substantially on the plane of the line 1—1 of Fig. 2.

Fig. 2 is a plan view of the structure illustrated in Fig. 1.

The container 11 is a standard type of five-gallon metallic fuel container, customarily used by the United States Army in field refueling operations and described in full detail in my copending application, Serial No. 412,975, filed September 30, 1941. Inasmuch as the container structure, per se, is not regarded as an essential part of the present invention, it will not be described in further detail in this application except to point out that it includes a filling aperture having an internally threaded neck 12 and an annular sealing flange 13 positioned on an inclined top surface of the container closely adjacent a handle structure 14.

The closure cap for the container includes a plug portion 15 having a threaded section 16 adapted to fit loosely into the threaded neck 12 of the filing aperture of the container. An annular sealing flange 17 surrounds the plug so that the closure cap structure includes a smooth, regular top surface. A resilient gasket member 18 is arranged to be clamped between the flange 17 and the flange 13 to seal the filling opening. A plurality of upwardly extending tightening lugs 21 and 22 are provided on the outer rim of the sealing flange 17 so that the closure cap may be readily turned by hand to tighten it against the sealing flange or to remove it from the aperture 12, and these upwardly extending lugs 21 and 22 are preferably made of such dimensions that they may be easily and quickly engaged by a tool of almost any shape as, for example, the flat bar wrench 23 illustrated in the drawing or any similar structure such as a board, hammer handle, tire iron, or tent stake. As illustrated in the drawing, it will be seen that two of the tightening lugs 21 and 22 are provided on the cap, but it is considered within the scope of this invention to provide more or less, as desired.

The entire cap mechanism, as thus far described, has also been in use by the United States Army and is not claimed as new in the present application except in combination with the particular type of retaining means to be hereinafter described. It may be pointed out to advantage, however, that in the prior art the caps of the structure herein described have been secured to the container by a short length of chain extending from a pivot in the center of the cap to the handle 14. This has been found to be an objectionable feature, since the chain has a tendency to fall into the path of the lugs 21 and 22 and to prevent the cap from being quickly spun into place or removed.

The improved retaining mechanism forming the essence of the present invention includes a pivot socket 31 having a pair of flanges 32 and 33 spotwelded or otherwise secured to the lower portion of the filler plug 15. A pivot opening 34 is provided in the top of the socket 31 and a retainer link 35 is pivotally secured to the socket by the enlarged head 36. It will be understood from an examination of the drawing that since the head portion 36 is larger than the opening 34 the retaining link 35 is pivotally connected to the cap 15 but that unlimited free pivotal movement of the cap is possible.

The retaining link 35 includes a bend immediately above the head portion 36 terminating in a straight portion 37 extending outwardly in a radial direction from the cap center and in a plane somewhat below the upper surface of the cap and substantially parallel with the plane of the surface 38 defined by the annular flange 17. The link 35 is upwardly offset at 41 where it includes a contact portion arranged to bear against the inner curved bearing portion 42 of the marginal sealing flange 17 of the container for purposes that will appear hereinafter. The retaining link 35 is thence offset upwardly above the plane of the cap surface 38 to the point 43 spaced somewhat above the upper extremity of the path of movement of the lugs 21 or 22. A loop 44 is provided at the outer end of the link 35 and the loop 44 is connected to an anchoring loop 45 on the container handle 14 by a short length of chain, for example, the single link 46 illustrated in the drawing. The construction and arrangement of the retaining links 35 and the pivot socket 31 is such that the cap 15 may revolve freely in either direction without interference from the retaining link. The offset 43 is sufficient that the portion 41 of the link will contact the smooth, annular track or bearing surface formed at the inner edge of the sealing flange 17 before the offset portion 43 comes into the path of the movement of the lugs 21 and 22. Thus, even if the link contacts the closure cap at the point 42 it will offer no obstruction to rotary movement of the cap and the cap may spin freely. It should also be noted, however, that the construction of the pivotal connection between the retaining link 35 and the cap 15 is such that the retaining link cannot turn appreciably on its axis, with the result that the offset portion 43 will always extend upwardly away from the plane surface 38 of the cap and will always provide ample clearance for the movement of the tightening lugs 21 and 22. It may be noted in passing that the entire sealing effect

of the cap is accomplished by the gasket 18, so the threads between the internally threaded neck 12 and the threaded portion 16 of the closure plug may be quite loose. Thus, the cap is entirely free to spin when being inserted in or removed from the container.

The operation of the device is as follows:

After filling the container, the threaded portion 16 of the cap 15 is inserted into the threaded neck 12 of the container and turned until the threads engage. One of the lugs 21 or 22 is then flicked with the finger to spin the cap downwardly in one single quick motion, thus bringing the sealing flange 17 and the gasket 18 into engagement with the sealing flange 13 of the container. The cap is tightened by applying a bar wrench or other tool across the cap and against the lugs 21 and 22, to urge the cap in a clockwise direction and tighten the threads. As an alternative method, it is only necessary to strike one of the lugs 21 or 22 with a hammer or similar instrument to force it in a clockwise direction and seal the container.

It is to be noted that as this operation takes place it is entirely unnecessary for the operator to touch the retaining link 35 or any of its associated mechanisms, since the contact between the portion 41 of the link and the smooth bearing surface 42 of the container cap will prevent any portion of the link from falling into the path of the lugs 21 and 22 and thus interfering with the spinning movement of the cap.

To remove the cap it is only necessary to apply a tool such as indicated by 23 across the face of the cap and into engagement with the opposite sides of the lugs 21 and 22 and then give a quick turn on the tool to spin the cap in a counterclockwise direction. In fact, in practice, the caps may be removed by striking a sharp blow on either of the lugs 21 or 22. This will loosen the cap and at the same time spin it free from the container so that it may hang downwardly over the side of the container until replaced after filling.

When the bar 23 or other tool is applied across the surface of the cap to engage the lugs 21 and 22 it will be noted that the straight portion 37 of the retaining link 35 is substantially below the surface 38 of the cap and is within the central cavity of the cap. Thus, the bar or other tool may be laid flat against the upper surfaces of the flange without any interference whatsoever from the retaining link 37.

From the foregoing description, it will be apparent that by following the teachings of the present invention it is possible to provide a closure cap retainer of extremely simple and rugged design, whereby the closure cap is capable of being applied to or removed from the container in a far quicker and easier manner than has been practicable in any of the structures known in the prior art. The exact form and construction of the device illustrated in the drawing constitutes a preferred embodiment of the invention as adopted for use in the United States Army and as considered preferable for military purposes. It is believed, however, that the utility of the present invention extends to civilian and commercial fields, as well as to fields of military endeavor, and that numerous modifications of structure and rearrangement of parts may be resorted to without departing from the spirit of the invention. It is, therefore, requested that the scope of the invention be regarded as limited only by the scope of the appended claim.

Having thus described my invention, what is claimed as new and desired to secure by Letters Patent, is:

In combination with a portable metallic liquid container including a filling aperture and handle structure, a closure cap associated with said filling aperture, said closure cap including a plug portion having a central cavity, external threads on said plug portion adapted to engage cooperating threads associated with the filling aperture of the container, a flat annular sealing flange extending around the upper threaded portion of the closure cap, a sealing gasket associated with said sealing flange and adapted to be forced into sealing relationship with the sealing surface surrounding the filling aperture of the container, a plurality of lugs projecting upwardly from said closure to the cap above the normal plane of the top of said cap and adapted to be engaged by a flat bar extending diametrically across the cap, a retaining link for said cap, said retaining link including an inner end portion arranged in pivotal connection with a pivot socket affixed within the central cavity of the cap, a radial portion extending outwardly from said pivot and substantially below the plane of the cap surface, a contact portion adapted to contact the cap surface, an offset portion extending from said contact portion upwardly and away from the plane of the cap surface a distance greater than the height of the aforementioned tightening lugs affixed to the cap surface, and a flexible connection between the outer extremity of the retaining link and the container body, the arrangement being such that the offset portion of the retaining link will be maintained at all times out of the path of movement of the tightening lugs during the tightening or loosening operations of the container closure.

WILLIAM B. JOHNSON.