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F. A. HART

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HOT WATER BOTTLE AND THE LIKE

Filed May 27, 1919

Fig. 1.

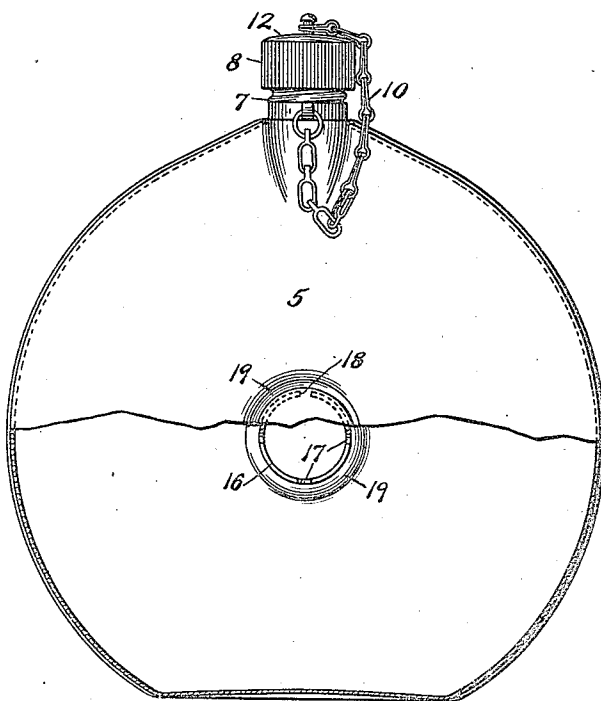


Fig. 2.

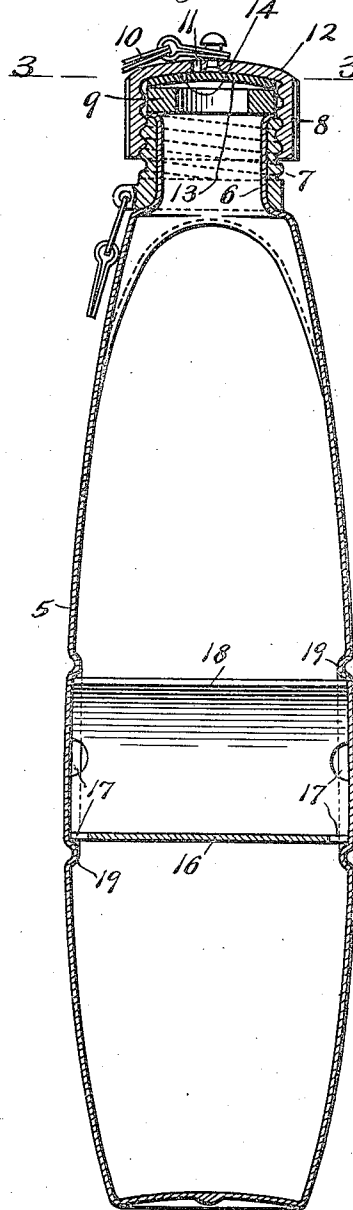


Fig. 3.

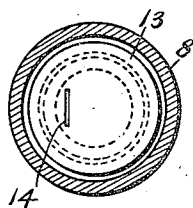
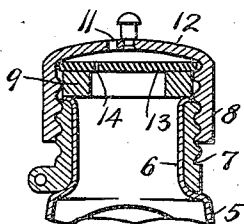


Fig. 4.



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UNITED STATES PATENT OFFICE.

FREDERICK A. HART, OF NEW BRITAIN, CONNECTICUT, ASSIGNOR TO LANDERS, FRARY & CLARK, OF NEW BRITAIN, CONNECTICUT, A CORPORATION OF CONNECTICUT.

HOT-WATER BOTTLE AND THE LIKE.

Application filed May 27, 1919. Serial No. 300,143.

To all whom it may concern:

Be it known that I, FREDERICK A. HART, a citizen of the United States, residing at New Britain, county of Hartford, and State of Connecticut, have invented certain new and useful Improvements in Hot-Water Bottles and the like, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to hot water bottles and the like, and particularly to hot water bottles made of metal.

It not infrequently happens in the use of hot water bottles, that the bottle is sealed when only partially filled. As a result, when the hot water cools, there is created in the bottle a vacuum of considerable degree. Oftentimes this vacuum is so great as to cause an inward collapse of the metal body of the bottle. The vacuum at times is so great that even the use of a cross brace does not prevent collapse of the metal body due to the excess of atmospheric pressure.

It is the principal object of the present invention to provide a self-venting hot water bottle, that is to say, a bottle so constructed that upon any tendency toward the creation of a vacuum, there ensues an admission of air to relieve such vacuum.

With this general object in view, the invention consists in the combinations, features, details of construction and arrangements of parts which will first be described in connection with the accompanying drawing and then more particularly pointed out. In the drawing Figure 1 is a view in side elevation, with parts in vertical section, of a metal hot water bottle constructed in accordance with the invention.

Figure 2 is an enlarged view of the bottle taken in vertical section.

Figure 3 is a cross-sectional view taken on the line 3—3 of Figure 2, and

Figure 4 is a view similar to the upper portion of Fig. 2, showing a different position of the parts.

The bottle illustrated as an example comprises a metal body 5 which may be of any desired shape and size. As shown, the bottle is proportioned to obtain a large volume of water with a flat or "watch" shape considered desirable for comfort and is flattened at the bottom so it can stand upright. The body, in the present embodiment, is formed

with a neck 6 on which is mounted a threaded collar 7. This collar 7 may be forced onto the neck 6 and the rim of the neck spun solidly over the top of the collar, as clearly shown in Fig. 2. The bottle shown in the present exemplification is closed during use by a cap or closure 8 which is threaded on the interior to screw onto the threaded collar 7 and which carries a sealing gasket 9. The exterior of the cap 8 may be knurled if desired, as illustrated in Fig. 1. In order to prevent loss of the cap and to provide means for carrying the bottle when hot, the cap may be attached to the collar 7 by a short link chain 10.

The invention includes means whereby a tendency toward the creation of a vacuum in the bottle permits the admission of air to relieve such vacuum. This may be accomplished, for example, by forming in the bottle an air-inlet port and providing closure means for such port. Although variable within a wide range, in constructions embodying the invention to the best advantage there is provided, in connection with an air-inlet passage, an abutment wall and a pressure-actuated member movable into and out sealing contact with the abutment wall, thereby to close and open the passage.

Although there may be a wide range in the details of construction and arrangement of the elements mentioned, in the embodiment illustrated there is formed in the top of the cap, near the center thereof, an air-inlet port 11. The inner top wall 12 of the cap, which comprises an abutment wall, is slightly concave, and clamped between this part of the cap and gasket 9 is a flexible diaphragm 13 constructed of light rubber or other suitable material. It will be seen from the drawing, that this diaphragm extends across the neck of the bottle when the cap is in place. To provide communication between the port 11 and the interior of the bottle, the diaphragm is provided with an aperture. In the present instance, there is cut in the diaphragm a slit 14. This slit is so positioned that, regardless of the angular position of the diaphragm, it is always in alinement with the orifice of the gasket, and out of alinement with the port 11. That is to say, the slit 14 is so positioned that when the diaphragm is pressed against the cap, the slit is offset from the port 11.

It will be seen that with the construction described, there is a passage into the interior

of the bottle comprising port 11, the space between the cap and the diaphragm, and aperture 14.

In the use of the bottle above described, any interior pressure, such as the surge of water, against the flexible diaphragm, causes the diaphragm to snugly nest against the abutment wall 12, as illustrated in Fig. 2. Since port 11 and aperture 14 are out of alignment, this sealing contact of the diaphragm with the wall 12 effectively closes the passage mentioned. In other words, the port 11 is closed and no water can escape.

Should the cooling of the hot water in a partially filled bottle tend to create a vacuum, the excess of atmospheric pressure against the diaphragm causes it to flex in the opposite direction, that is, away from the wall 12, to some such position as that shown in Fig. 4. This movement of the diaphragm opens the port and passage and this permits the admission of air into the bottle to relieve the vacuum.

There is provided a tubular cross-brace for the bottle having provision for the circulation of water, and held in place by beads formed in the bottle body.

Although capable of various constructions, in the embodiment illustrated, there is provided a tubular cross-brace in the form of a cylindrical member 16, the ends of which abut against the side walls of the bottle body 5 as appears in Fig. 2. To permit circulation of water through the space enclosed by the cross-brace, there is formed in the end edges of the member 16 a plurality of segmental openings 17. Furthermore, the member 16 is not a perfect cylinder but is provided with a narrow lengthwise slit 18. The construction described permits the passage of water into and out of the tubular cross-brace.

To hold the brace in position, each side wall of the bottle body is formed with an

internal bead 19 of a circumference to embrace the end of the tubular cross-brace. The two beads are located opposite each other and when the ends of the cross-brace are placed within the embrace of the beads, the brace is securely positioned without the use of any extraneous fastening means.

The bottle herein illustrated is formed by welding together two similar parts and the cross-brace is assembled in the embrace of the beads prior to the welding process.

With a metal hot water bottle such as that described, crushing by heavy weights is prevented by a cross-brace which does not interfere with circulation of water, and collapse of the metal body due to the creation of a vacuum is prevented by provision for the admission of air by a construction which at the same time seals the bottle against escape of the water.

It is to be understood that the term "vacuum" in the specification and claims is used in its relative, and not in an absolute, sense; and that the term "bottle" is used comprehensively.

What is claimed is:

A hot water bottle or the like, comprising a body portion having a neck, a cap associated with said neck, a perforated gasket in said cap, the cap being provided with an air-inlet opening in its top, and a flexible diaphragm mounted between the top of the cap and said gasket and having an opening in alignment with the opening of the gasket and offset from the opening in the cap, said diaphragm being movable into and out of contact with the top of the cap, whereby air may enter the bottle under excess external pressure and egress of liquid from the bottle is prevented.

In testimony whereof, I have hereunto set my hand.

FRED'K A. HART.