Sept. 6, 1932. C. A. ZAROBSKY 1,875,907

CLOSURE

Filed July 26, 1929

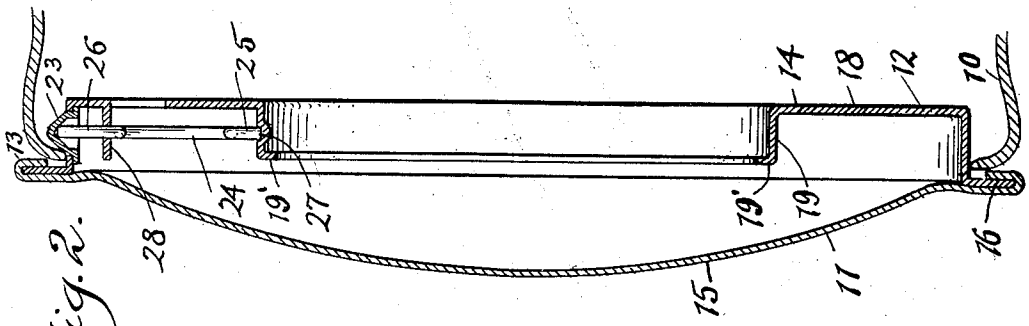


Fig. 2.

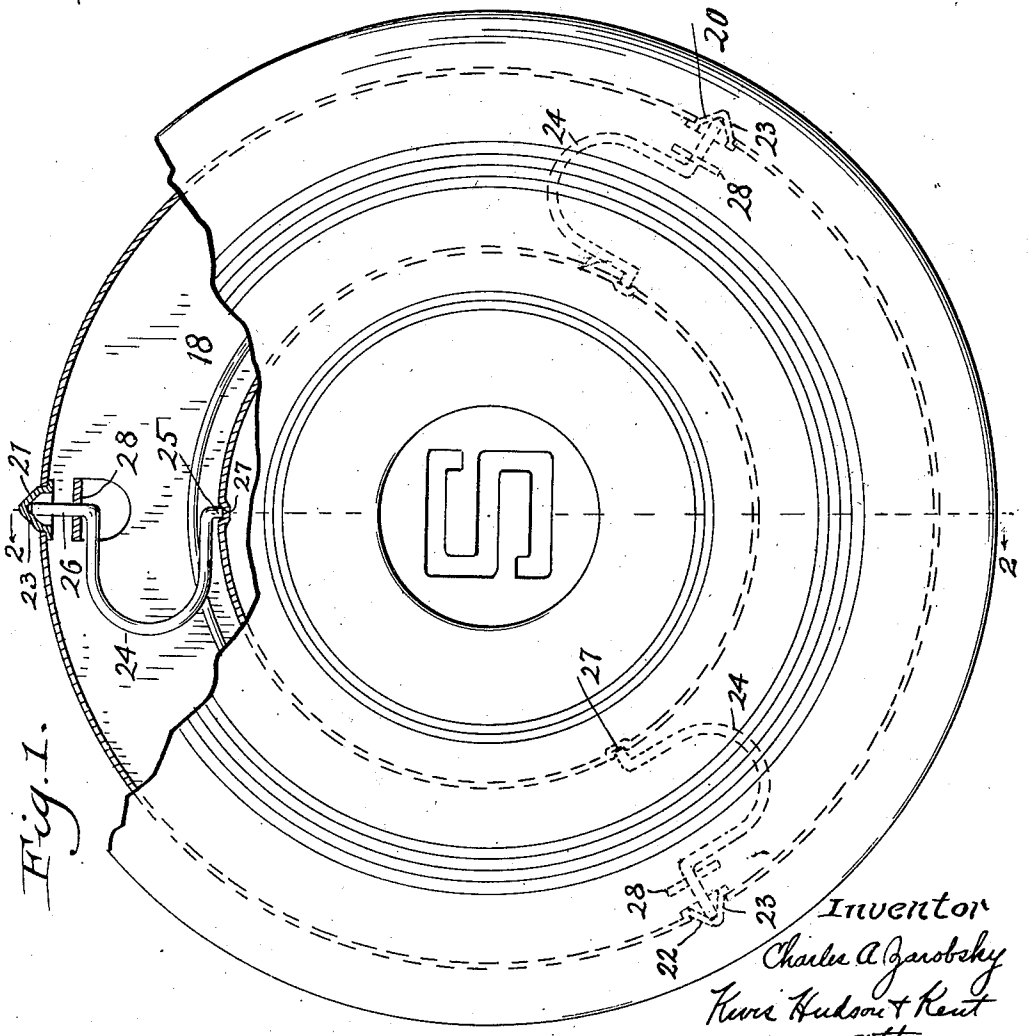


Fig. 1.

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UNITED STATES PATENT OFFICE

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CLOSURE

Application filed July 26, 1929. Serial No. 381,148.

This invention relates to closure devices, and more particularly to an improved form of cap or closure which may be used on the exposed end of a vehicle wheel hub or on a container filler neck or the like.

An object of this invention is to provide a closure device having an improved form of locking device whereby the cap or closure may be quickly and easily applied to or removed from a member opening without requiring relative rotation between the closure and said member, and in which the assembling of the parts constituting the locking device and the body of the closure is greatly facilitated.

The invention may be further briefly summarized as consisting in certain novel combinations and arrangements of parts hereinafter described and set out in the appended claims.

In the sheet of drawing forming a part of this application,

Fig. 1 is a top plan view of my improved form of closure, with parts thereof broken away; and

Fig. 2 is a sectional elevation taken on line 2—2 of Fig. 1, showing my closure applied to a member opening.

Referring now to the drawing for a detailed description of my invention, I show a closure device comprising a member having an opening therein, and a cap or closure adapted to be applied to the member in any angular position, and releasably locked to the member without requiring relative rotation between the latter and the closure.

In the drawing I show my improved form of cap or closure applied to a member 10, which may be a vehicle wheel hub, a container filler neck, or a similar tubular member, having an opening to be closed. This improved form of closure which, in Fig. 2, is shown applied to one end of a tubular member, comprises a body 11 having a portion 12 adapted to extend into the member opening, and an annular flange 13 which abuts against the end of the tubular member. The closure body may be of any desirable form of construction, but in this instance consists of a ring-shaped inner part 14 which forms the extension 12, and an outer part or shell 15 which, for the purpose of ornamentation, may assume any desired shape. These parts are permanently secured together by providing the inner part with a laterally extending peripheral flange 16 around which the portion 17 of the outer part is crimped or beaded. The bottom wall 18 of the extension 12 is preferably provided with a central opening surrounded by the axially extending stiffening flange 19 which terminates in the inturned, radially extending reenforcing flange 19′.

For releasably securing the closure upon the member 10, I provide the extension 12 with spaced locking members 20, 21, and 22 which engage the edge of said member surrounding the opening therein. In this instance I have shown three locking members spaced 120° apart, but any suitable number of such locking members may be employed. The locking members are made movable relative to the extension 12 and are constructed in the form of small plungers 23 having rounded end portions which extend laterally through openings formed in the side wall of the extension, for locking engagement with the edge surrounding the member opening. These plungers are normally held laterally outwardly in locking position by means of springs 24. Each spring is formed by bending a piece of resilient material, such as spring wire, to substantially U-shape and turning the end portions in opposite directions to form the relatively stationary straight end portion 25, and the relatively movable straight end portion 26. These springs are preferably uniplanar, that is to say, formed so that all parts thereof lie in substantially the same plane, and when arranged in their final assembled position the springs all lie in substantially the same plane. The springs are normally maintained under compression with the movable end portions bearing against the plungers and the opposite or stationary end portions bearing against the axially extending flange 19 which serves as an abutment for the springs. The stationary end portions 25 of the springs are retained in position by providing the flange 19

with recesses or depressions 27 in which these end portions are received. The movable end portions 26 of the springs are retained in proper position by providing guiding lugs 28 through which the end portions 26 extend. As shown in the drawing, these guiding lugs may be formed integral with the body of the closure by striking up portions of the metal of the bottom wall 18.

In addition to serving as means for retaining the springs in proper position, the depressions 27 and the lugs 28 also serve as pivotal mountings for the end portions of the springs, thereby greatly facilitating the operation of assembling the parts of the locking device into the bottom part. The parts of the locking device are assembled into position before the top and bottom parts are secured together, and during this assembling operation the U-portion of the springs can be conveniently grasped while the end portions are inserted between the lug 28 and the flange 19. After the end portions have been properly positioned, the springs may be rotated so that the U-portions will all lie in a plane substantially parallel with the plane of the bottom wall 18.

In applying the closure to the member opening, the extension 12 is positioned in the opening, with the locking members 20, 21 and 22 abutting against the edge surrounding the opening and preventing the extension 12 from fully entering the opening. The closure is pressed inwardly from this position, and as the extension 12 moves further into the opening the locking members 20, 21 and 22 move laterally inwardly so as to compress the springs 24, and ride over the edge of the member surrounding the opening. When the extension 12 has fully entered the member opening, these members or plungers move laterally outwardly and engage the edge surrounding the member opening so as to lock the closure in place. When it is necessary to remove the closure from the member opening, the closure may be pried away from the member 10, causing the plungers to move inwardly and ride over the edge of the opening, thereby releasing the closure.

It will be seen that in the closure device which I have provided the closure may be applied to the member opening in any angular position, and that the closure may be applied and releasably locked to the member without requiring relative movement between the parts. It will also be seen that in this arrangement the edge of the member surrounding the opening need not be provided with the cam portions heretofore commonly provided for quickly detachable closures, and that the parts of the closure itself can be quickly and conveniently assembled.

While I have shown and described the device of my invention in a detailed manner, it should be understood that I do not limit myself to the precise details shown and described, but regard my invention as including such changes and modifications as do not involve a departure from the spirit of the invention and the scope of the appended claims.

Having thus described my invention, I claim:

1. A closure comprising a body having a portion adapted to extend into an opening to be closed, said body portion having inner and outer walls with a recess therebetween, a locking member carried by the outer wall and normally extending laterally therethrough for retaining said portion in said opening, and a substantially U-shaped spring disposed in said recess and having a relatively stationary end portion in engagement with the inner wall of said body portion and a relatively movable end portion in engagement with said locking member.

2. A closure comprising a body, having a portion adapted to extend into an opening to be closed, said body portion having inner and outer substantially circular walls with an annular recess therebetween, spaced locking members disposed in said outer wall for engagement with the edge of the opening to be closed, said locking members being movable laterally relative to said body, U-shaped spring members arranged substantially in one plane in said recess and each having a stationary end portion in engagement with said inner wall and a movable end portion in engagement with a movable locking member, means for retaining said stationary end portion in a fixed position, and means spaced from said retaining means for guiding the movement of said movable end portion.

3. A closure comprising a body having a portion adapted to extend into an opening to be closed, a locking member on said body for engagement with the edge of the opening to which the closure is applied, a substantially U-shaped spring having a movable end portion in engagement with said locking member for normally pressing the latter into locking position, said body having a recess for receiving and positioning the other end of said spring, and means for guiding and supporting the movable end portion of said spring, the last mentioned means and said recess forming pivotal supporting means whereby said spring may be swung at assembly of the closure parts to a position substantially in the plane of the closure.

4. A closure comprising a body having a substantially cylindrical hollow portion adapted to extend into an opening to be closed, a locking member movable radially relative to said portion for releasable engagement with the structure surrounding said opening, a substantially U-shaped spring disposed in said hollow portion and having

angularly disposed end portions engaging, respectively, said body and said locking member for urging the latter toward locking position, and spaced means on said body in substantial radial alignment with said locking member for positioning the end portions of said spring.

5. A closure comprising a body having a portion adapted to extend into an opening to be closed, a locking member movable radially relative to said portion for releasable engagement with the structure surrounding said opening, a substantially U-shaped spring having end portions engaging, respectively, said body and said locking member for urging the latter toward locking position, means on said body for positioning said spring comprising a recess adapted to receive one of said end portions, and a lug spaced substantially radially outwardly from said recess and having an opening through which the other of said end portions extends.

6. In a closure of the character described, the combination of a body having a portion adapted to extend into an opening to be closed, said body portion having inner and outer walls with a recess therebetween, and a locking spring disposed in said recess, said spring having a movable end portion extending through the outer wall and a stationary end portion engaging the inner wall of said body portion.

7. In a closure of the character described, the combination of a body having a portion adapted to extend into an opening to be closed, said body portion having inner and outer walls with a recess therebetween, a locking spring disposed in said recess, said spring having a movable substantially straight end portion extending through the outer wall and a stationary end portion engaging the inner wall of said body portion, and means on said body and extending into said recess for guiding said movable end portion.

In testimony whereof, I hereunto affix my signature.

CHARLES A. ZAROBSKY.

CERTIFICATE OF CORRECTION.

Patent No. 1,875,907. September 6, 1932.

CHARLES A. ZAROBSKY.

It is hereby certified that the name of the assignee in the above numbered patent was erroneously described and specified as "The Eaton Manufacturing Company", whereas said name should have been described and specified as Eaton Manufacturing Company, as shown by the records of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 22nd day of November, A. D. 1932.

(Seal)

M. J. Moore,
Acting Commissioner of Patents.