Feb. 21, 1933. W. JAY 1,898,373

CLOSURE CAP

Filed Sept. 8, 1931 2 Sheets-Sheet 1

Fig. 1

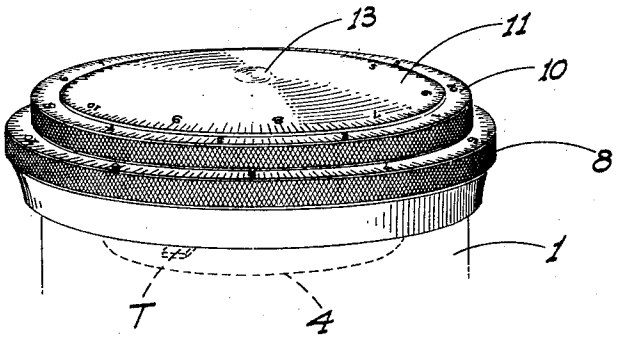


Fig. 2

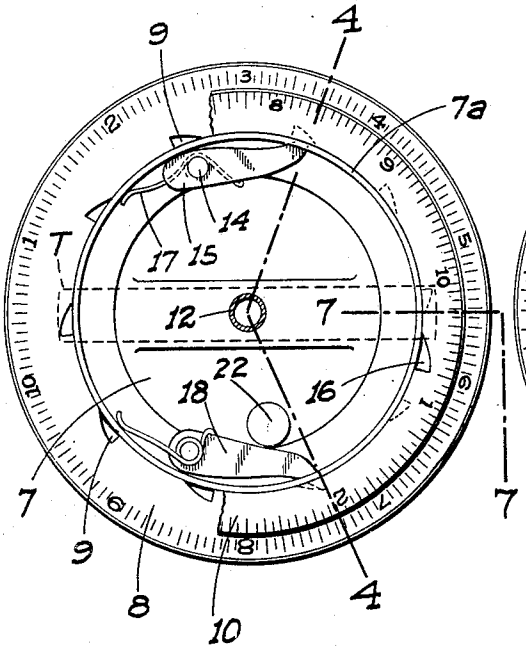
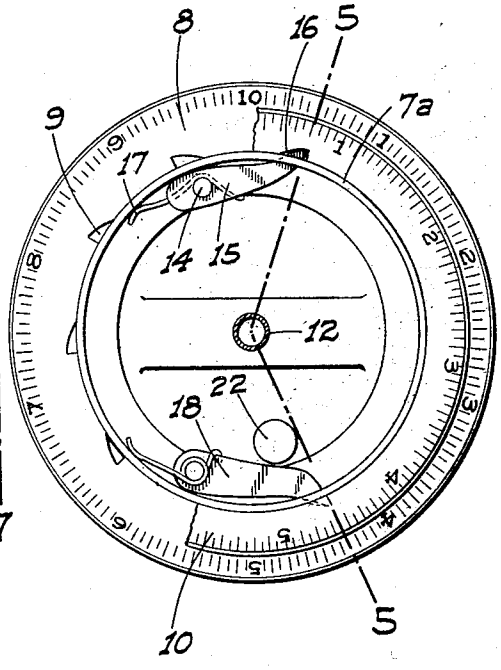


Fig. 3



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Filed Sept. 8, 1931 2 Sheets-Sheet 2

Fig. 4

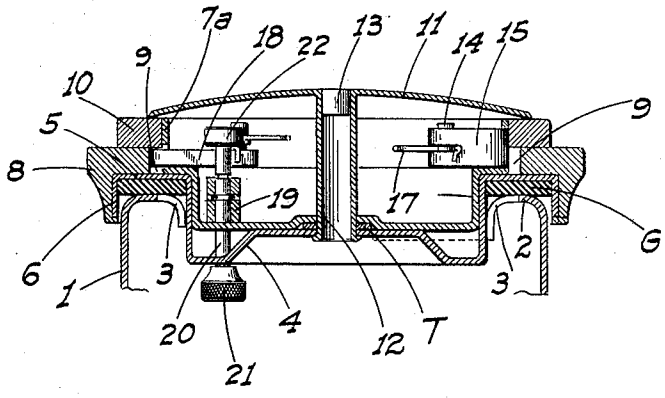


Fig. 5

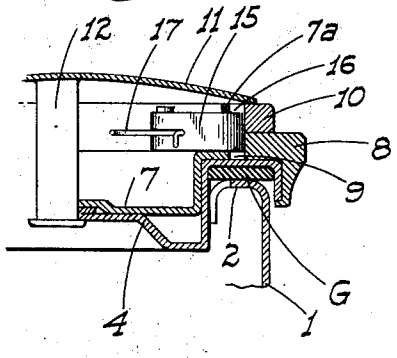


Fig. 6

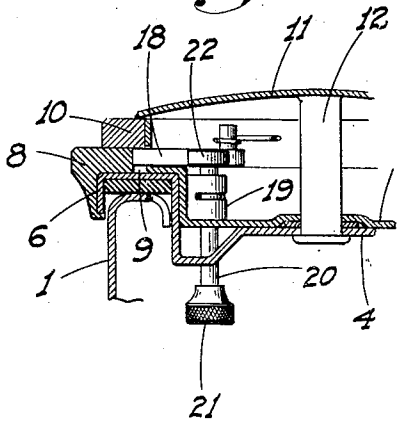
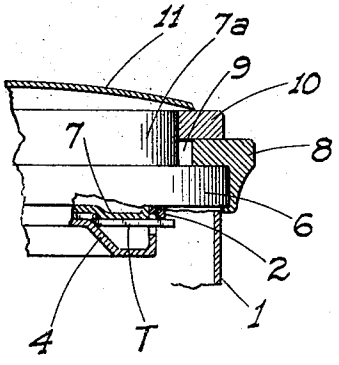


Fig. 7



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Patented Feb. 21, 1933 1,898,373

UNITED STATES PATENT OFFICE

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CLOSURE CAP

Application filed September 8, 1931. Serial No. 561,631.

This invention relates to caps for gas tank outlet or radiator filler tubes and similar members. The invention particularly relates to caps of that type which are arranged to cooperate with the tube in such a manner that rotation of the cap in one direction is necessary to positively mount the same in connection with the tube, and removal of the cap can only be effected by a rotation in the opposite direction.

The principal object of my invention is to provide as a part of a cap of this character a means to enable the cap to be readily turned to a tube engaging position, but which is normally not operative to effect the removal of the cap. In connection with such means I have arranged a combination controlled device for placing said means in operative relation to the cap to enable the same to be removed; said combination being only known to the proper persons. A feature of this device is that no key controlled or other relatively delicate and complicated mechanism is necessary, and the standard form of cap provided for engagement with the type of tube now commonly used is not altered in any way.

My improved cap can therefore be applied to any such tube without any change being made to the latter.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Fig. 1 is a perspective view of the cap.

Fig. 2 is a top plan view of the same with the cover plate removed showing the cap and outer rings in relatively turnable and released position.

Fig. 3 is a similar view showing the cap and rings in locked relation.

Fig. 4 is a transverse section on the line 4—4 of Fig. 2.

Fig. 5 is a similar view on the line 5—5 of Fig. 3.

Fig. 6 is a fragmentary transverse section showing the holding of one of the pawls in non-releasable relation with the outer ring.

Fig. 7 is a fragmentary radial section on the line 7—7 of Fig. 2.

Referring now more particularly to the characters of reference on the drawings, the numeral 1 denotes the tube which the cap is designed to close, said tube having an inwardly and then downwardly extending flange 2 about its rim which is provided with opposed slots 3. The cap proper comprises a cylindrical cup 4 adapted to fit inside the flange 2 and provided with a top outwardly projecting flange 5 having a depending skirt 6 about its outer edge, which overhangs the top of the tube 1. A tube engaging gasket G is fitted between the cup and skirt. Pressed into the cup 4 is an inner cup 7 whose upper portion 7*a* projects above the cup 4 and while preferably of larger diameter than said cup is of smaller diameter than the skirt. A transversely extending spring tongue T is rigidly mounted between the cups and projects at both ends through the outer cup. The tongue is longer than the diameter of the flange 2 and is adapted to project through the slots 3, and is positioned so that it is disposed below said flange when the cap is in place on the tube. Turning the cap from this position therefore moves the tongue beyond the slots and prevents the removal of the cap without turning the same in a backward direction.

Seated on the flange 5 and depending about and engaging the under edge of the skirt 6 in a non-removable manner is a ring dial 8. This ring closely and turnably engages the member 7*a* and is provided on its inner periphery, or adjacent said member, with a plurality of ratchet notches 9. Superimposed on the ring 8 and turnable on the member 7*a* independent of the ring 8 is another ring dial 10 of somewhat smaller diameter.

Extending over the cap and overhanging the upper dial 10 somewhat is a dial cover plate 11. This plate is smooth surfaced and is supported from a central tubular stem 12

which is secured against vertical movement to the bottom of the cups. The upper end of the stem preferably has a plug 13 therein which may be moved if it is desired to mount a radiator ornament or emblem on the cap. The stem is mounted so as to be relatively non-turnable, but with insufficient rigidity to permit the cap to turn with the cover should an attempt be made to tap the same around with a punch, or by turning the emblem if such is used.

The cover and dial rings are provided with numbered graduations about their upper faces as shown in Fig. 1 so that any desired combination of the numbers and relative positioning of the dials may be obtained. Pivotally mounted on a pin 14 which projects upwardly from the inner cup 7 is a pawl 15. This pawl is of such a height and on such a level that its outer end may engage any of the notches 9 and also a single notch 16 cut in the opposite direction in the inner periphery of the upper ring 10; the cup member 7*a* having a slot through which the end of the pawl freely projects. A spring 17 engages the pawl to yieldably force it against the dial rings.

Another spring pressed pawl 18 is also pivotally mounted in the cup in oppositely pointing relation to the pawl 15 and arranged to engage only the notches 9. Said notches and pawl are arranged to cause a clockwise rotation of the dial ring 8 to also rotate the cap as a whole; this being the direction in which the cap is mounted in place on the tube.

In operation therefore the cap may be mounted in place regardless of the position of the dial rings relative to each other, since the pawl 15 has no function in conection with this movement. When once so mounted however turning of the rings 8 or 10 will not effect rotation of the cap unless the pawl 15 is engaged with the notch 16. This said pawl cannot do unless one of the notches 9 is also alined with the notch 16 so as to permit of the outward movement of said pawl beyond the periphery of the rings and into said notch. Since the notches are concealed from the exterior such positioning of the notches relative to each other and to the pawl can only be effected by the proper turning of the rings relative to each other and to the cover plate, which movement is determined by a predetermined positioning of selected ones of the graduation numbers relative to each other. When moving the ring 8 in a counter-clockwise direction the pawl 9 constantly clicks past its notches, which will give to an unauthorized person a desired false impression of getting the combination. Also the two pawls engage the respective notches at the same instant, so that the proper positioning of said notches and the combination cannot be told by sound or by feel.

The pawl 15 having thus engaged the notch 16 the cap and dial ring 8 are locked together for turning in a counter clockwise direction, which will permit the removal of the cap from the tube. After the cap has been removed the combination may be destroyed by turning the dials relative to each other, since this combination is not necessary for mounting the cap in place as previously explained.

In case it is desired to use the cap without the combination or as a rigid structure I provide the following arrangement.

Slidably mounted in a bearing 19 in the cup 7 to one side of the pawl 18 is a stem 20 parallel to the pivot of the pawl. This stem is positioned so as not to interfere with the movement of the pawl into or out of the notches. The stem may be moved up or down from under the cap by a finger button 21. Inside the cap is an enlarged head 22. This head is arranged when the stem is pulled down to pass closely behind and lie on a level with the pawl when the latter is engaged with any notch. Said pawl therefore cannot leave the notch and the ring and cup unit will turn as one in either direction.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention what I claim as new and useful and desire to secure by Letters Patent is:

1. A closure cap for a tube, holding means between the cap and tube requiring a rotation of the cap in one direction to effect the functioning of the holding means and a rotation of the cap in the other direction to permit of the removal of the same, members turnably mounted on and together covering the exposed portion of the cap, means between one of said members and the cap to cause the rotation of said member only in a cap placing direction to also rotate the cap, and means between the cap and a pair of the members and requiring a predetermined positioning of the same relative to each other to enable a rotation of said one member in a cap removing direction to also rotate the cap.

2. A closure cap for a tube, holding means between the cap and tube requiring a rotation of the cap in one direction to effect the functioning of the holding means and a rotation of the cap in the other direction to permit of the removal of the same, a pair of superimposed rings separately and turnably mounted on the portion of the cap above the tube, one of said rings having a plurality of ratchet notches about its inner periphery facing in the other direction and the other ring

having a single notch in its inner periphery facing in the opposite direction, a spring pressed pawl mounted in the cap to engage said first named notches only, and another spring pressed pawl mounted in the cap to engage the single notch and also the first named notches.

3. A device as in claim 2, with means mounted in the cap and operable at will from under the cap to lock the first named pawl from release from any notch.

4. A device as in claim 2, with a stem movably mounted in the cap to one side of the first named pawl and projecting through the bottom of the cap for manipulation from below the cap, and an enlarged head on the stem within the cap normally clear of but movable to the level of the pawl in the path of releasing movement of the same and capable of being so moved only when the pawl is engaged with a notch to prevent retractive movement of the pawl.

5. A closure cap for a tube comprising a hollow cylindrical body to depend part way into the tube, said body being held in the tube by a rotation of the body in one direction and removable from the tube only by a rotation in the opposite direction, a ring turnably mounted on the body above and overhanging the tube, another ring above the first ring turnably mounted on the body separate from said first ring, a cover plate nonturnably mounted on the body and overhanging the inner periphery of the upper ring, means between the lower ring and the body to cause the ring and body to rotate together only when said ring is rotated in a cap placing direction, and means between the body and rings to cause said lower ring and body to rotate together in a cap removing direction only when said rings have been rotated to a predetermined position relative to each other and to the plate.

6. A closure cap for a tube, holding means between the cap and tube requiring a rotation of the cap in one direction to effect the functioning of the holding means and a rotation of the cap in the other direction to permit of the removal of the same, members mounted on and covering the exposed portion of the cap, one member being turnable relative to the other, means between one of said members and the cap to cause the rotation of said one member only in a cap placing direction to also rotate the cap, and mechanism mounted on the cap and including a movable member requiring a predetermined positioning of the same relative to one of said first named members to enable a rotation of said one member in a cap removing direction to also rotate the cap in such direction.

7. A closure cap for a tube, holding means between the cap and tube requiring a rotation of the cap in one direction to effect the functioning of the holding means and a rotation of the cap in the other direction to permit of the removal of the same, a member turnably mounted on the cap, means between said member and the cap to cause the rotation of said member only in a cap placing direction to also rotate the cap, and a permutation lock structure between the cap and member to enable the latter to be selectively locked to the cap whereby said cap may be rotated in a removing direction by a rotation of the member in a corresponding direction.

8. A closure cap for a tube, holding means between the cap and tube requiring a rotation of the cap in one direction to effect the functioning of the holding means and a rotation of the cap in the other direction to permit of the removal of the same, a member turnably mounted on the cap, means between said member and the cap to cause the rotation of said member only in a cap placing direction to also rotate the cap, and means between the cap and member to enable the two to be locked together to permit of rotation of the cap in a removing direction by a rotation of said member in a corresponding direction.

In testimony whereof I affix my signature.

WEBB JAY.