

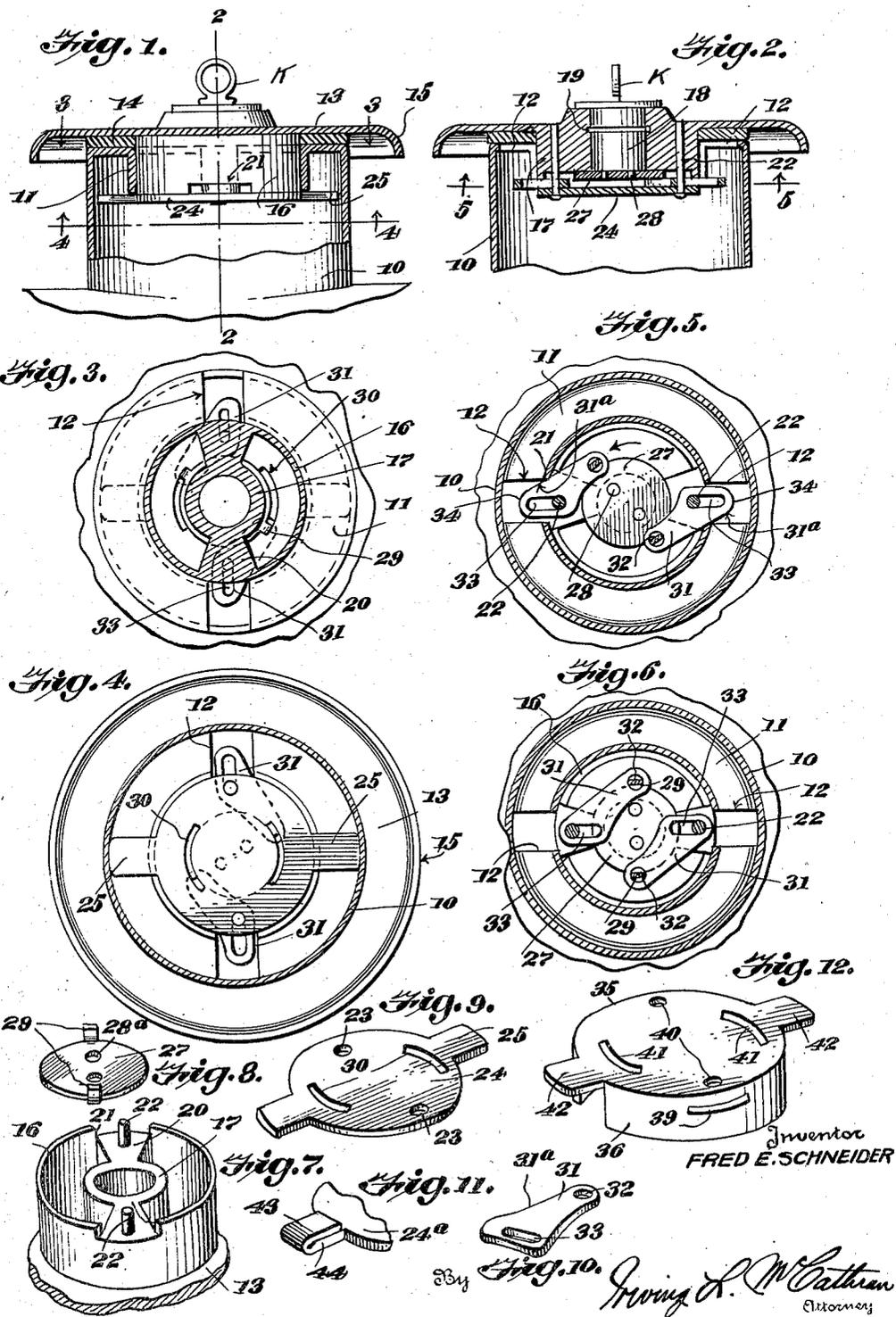
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LOCKING CLOSURE CAP

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LOCKING CLOSURE CAP

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This invention relates to a locking closure cap for filler spouts of gasoline tanks and the like, and one of the important objects of the invention is the production of a simple and efficient locking cap for fuel tanks of automobiles and other vehicles, the locking means being so constructed as to prevent the unauthorized removal of the cap by unauthorized parties.

A further object of this invention is the production of a simple and efficient locking closure cap for the filler necks of fuel tanks and the like, the parts of which are so constructed as to permit one standard size cover to be used for various sizes of filler necks, and which cap may only be removed by the insertion and manipulation of an authorized key and the proper manipulation of the cap upon the neck of the tank.

Other objects and advantages of this invention will appear throughout the following specification and claims.

In the drawing:

Figure 1 is a side elevation of a filler neck and a portion of a fuel tank with certain parts in section, showing the locking closure cap mounted thereon;

Figure 2 is a vertical sectional view taken on line 2-2 of Figure 1;

Figure 3 is a horizontal sectional view taken on line 3-3 of Figure 1;

Figure 4 is a horizontal sectional view taken on line 4-4 of Figure 1;

Figure 5 is a horizontal sectional view taken on line 5-5 of Figure 2 with the anchoring members in an anchoring position;

Figure 6 is a similar sectional view with the anchoring members in a released position;

Figure 7 is a perspective view showing the under face of the cap, certain parts being removed and the cover being broken away;

Figure 8 is an inverted perspective view of the actuating plate for the anchoring members;

Figure 9 is a perspective view of the locking plate;

Figure 10 is a perspective view of one of the anchoring members;

Figure 11 is a perspective view of a portion of the locking plate, showing a modified form of locking arm;

Figure 12 is a perspective view of a modified form of locking plate.

By referring to the drawing, it will be seen that 10 designates the filler neck of a fuel tank, such for instance, as a gasoline tank of an automobile, this neck 10 being of the conventional type having an inturned cap retaining flange

11 of the usual character, which flange 11 is provided with the usual pair of opposed notches 12.

A locking closure cap 13 is adapted to fit over the neck 10 and this cap 13 carries the usual gasket 14 which is adapted to fit between the upper end of the neck 10 and the lower face of the cap 13. The cap 13 is preferably formed of cast material and is preferably of a suitable diameter to fit upon various sizes of tank necks, since the side flanges 15 thereof need not necessarily fit snugly against the side of the neck 10 in order that the cap be retained upon the neck 10. The cap 13 is provided with an integral inwardly extending barrel 17 and a collar 16 which is concentrically mounted relative to the barrel and of greater length than the barrel 17, as shown in Figure 7. A conventional tumbler lock 18 of the barrel lock type known in some instances as a cylinder plug, is fitted in the barrel 17 and is held therein by an expansion split resilient ring 19 fitting in suitable registering annular grooves formed in the lock 18 and the inner face of the barrel 17. This structure permits the lock 18 to be forced into the barrel 17 and the ring 19 will snap into the groove formed in the barrel 17 when a position of registration is reached, thereby automatically locking the barrel or cylinder lock 18 within the barrel against unauthorized or accidental displacement.

Segmental blocks 20 are cast as part of the cap 13 and span the distance between the collar 16 and the barrel 17, these blocks being arranged in opposed relation and terminating short of the outer periphery of the collar 16 to provide opposed notches 21. Studs 22 project from the under faces of the blocks 20 which studs 22 extend through the apertures 23 formed in the locking plate 24. The heads of these studs 22 may be upset to provide rivets for firmly holding the locking plate 24 in engagement with the lower edge of the collar 16. This locking plate 24 is provided with a pair of opposed locking arms 25 which arms 25 are adapted to extend or drop down through the notches 12 in the flange 11 and by a quarter of a turn of the cap 13, the arms 25 will lock under the flange 11 in a position at right angles to the notches 12, as shown in Figure 4.

An actuating plate 27 is secured to the lower end of the barrel or cylinder lock 18 in a suitable manner whereby the rotation of the lock 18 through the medium of a suitable key inserted therein will rotate the plate 27 to the right or left. The lock 18 may be secured to the plate 27 by means of the studs 28 passing through the

apertures 28a formed in the plate 27. The ends of the studs 28 may be upset to constitute rivets or any other desired securing means may be employed. The plate 27 is provided with a pair of opposed ears 29 bent downwardly from the periphery thereof and these ears 29 extend through the arc-shaped slots 30 formed in the locking plate 24 to permit rotation of the plate 27.

A pair of anchoring members 31 are interposed between the plates 24 and 27, as shown in Figure 2, and each anchoring member 31 is provided with an aperture 32 at its inner end, the ears 29 extending through the apertures 32 as well as through the arc-shaped slots 30 in the plate 24. The outer end of each anchoring member 31 is provided with a transversely extending elongated slot 33 and the studs 22 carried by the blocks 20 extend through these slots 33 and limit the inward and outward movement of the anchoring members 31. The outer locking ends 34 of the members 31 project through the notches 21 in the collar 16 when the members 31 are moved to an anchoring position so as to extend into the notches 12 of the flange 11, as shown in Figure 5, and prevent the cap 13 from being rotated for removal by an unauthorized party. The anchoring members 31 are moved to an anchoring position as the barrel or cylinder lock is rotated in the direction shown by the arrow in Figure 5, and as the barrel or cylinder lock carrying the plate 27 is rotated in the opposite direction to the arrow shown in Figure 5, the outer ends 34 of the locking fingers 31 will be drawn inwardly within the notches 21 of the collar 16 and out of engagement with the notches 12 in the flange 11, thereby permitting the cap to be removed.

It should be understood that when the key K is inserted or the cylinder lock is unlocked with respect to the cap 13 so that the cylinder lock 18 is movable with respect to the cap 13, it is only necessary to rotate the cap 13 in the direction of removal or in a direction opposite to that shown by the arrow in Figure 5 to cause automatic withdrawal of the anchoring members 31, due to the fact that the inclined sides 31a of the anchoring members 31 will ride upon the side walls of the notches 12 with which the members 31 contact and cause the anchoring members 31 to be moved inwardly out of the notches 12.

In Figure 11, I have shown a modified form of locking arm wherein the outer end 43 of the arm 44 carried by the plate 24a is folded back upon the same to fit a fuel tank neck with a flange of less depth than usual. Such changes of this character may be made to accommodate the device to various standard types of tanks and necks.

As shown in Figure 12, I have illustrated a modified type of locking plate indicated by the numeral 35 which is somewhat similar to the structure shown in Figure 9 with the exception that the locking plate 35 is provided with an annular depending flange 36 formed integral with the plate 35. Guiding slots 39 are formed in the flange 36 through which the anchoring members 31 may extend. The plate 35 is provided with apertures 40 for receiving studs 22 and arc-shaped slots 41 for receiving the opposed ears 29 of the plate 27. The form of locking plate shown in Figure 9 may be substituted for that type shown in Figure 12 if and when desired, and is provided with arms 25 similar to the arms 42.

The locking plate having flanges 36, as shown in Figure 12, is especially designed for use in

connection with various sized filler necks, and in connection with a standard size cover. Although the locking plate may be of various sizes diametrically, all the perforations in the cap are uniform and various sizes of locking plates, as well as anchoring members, may be assembled therefore in any one of a number of standard sized covers. A further important feature of the present invention is the construction of the actuating plate illustrated and described above, and by employing these features just mentioned, the key in the lock need be rotated only about one-eighth of a turn or less, to lock or unlock the device. In actual practice it has been found that by a bare touch the anchoring members will slide outwardly very easily to the limit.

Although I have illustrated the device as being provided with a key-operated cylinder lock 18, it is obvious of course that the key-operated lock may be replaced by a combination lock and the like, without departing from the spirit of the invention.

From the foregoing description it will be seen that a very simple and efficient locking closure cap for filler spouts of gasoline tanks or fuel tanks, and the like, has been provided whereby the cap may be locked in secured position upon the neck to prevent the cap from being removed by an unauthorized party. The plate 24 is fixed and secured to the cap 13 by means of the studs 22, and the cap is dropped upon the top of the neck in a position to allow the arms 25 to drop through the notches or openings 12 in the flange 11. The cap is then rotated for a quarter of a turn to the position shown in Figure 4 and the key K in the lock 18 is rotated to rotate the plate 27 in the direction of the arrow shown in Figure 5 causing the ends 34 of the anchoring members 31 to be extended into the notches 12 thereby anchoring the cap against rotation, the arms 25 riding under the edge of the flange 11 of the neck 10 in the usual manner common to such caps and filler necks. The cap may be unlocked by rotating the key K in the opposite direction for withdrawing the anchoring members 31 to the position shown in Figure 6 thereby allowing the cap 13 to be rotated to a point where the arms 25 may be lifted up through the openings 12. An alternate method of removing the cap 13 is merely to insert the key K into the cylinder lock 18 to render the lock 18 movable with respect to the cap 13 and rotate the cap 13 in the direction of removal to cause the automatic withdrawal of the anchoring members 31 to an unlocked position. It should be understood that the arms 25 by fitting under the edge of the flange 11 will lock the cap in position against removal and the anchoring members 31 will anchor the cap against rotation.

It should be understood that the cap is provided with an inwardly extending collar 16 of a standard diameter to fit snugly against the turned flange 11 of the neck 10, but the cap 13 may be of a larger size such as is illustrated in Figures 1 and 2 to fit various sized necks, thereby allowing the device to be applied to various types of standard tanks by merely substituting the different sized locking plates, such as the plate 24 or the plate 35 and anchoring member 31.

Having described the invention, what I claim as new is:—

1. A locking closure cap for a fuel tank which has a flange with openings therein including a lock adapted to be operated for locking engage-

ment with said cap, a retaining member carried by said cap and having means fitting in said opening and movable under said flange for holding said cap against removal, an anchoring member pivotally connected to said lock, and guide means carried by said cap and engaging said anchoring member for limiting the swinging movement of said anchoring member, said anchoring member being movable to and from an engaging position with respect to said opening in said flange as said lock is rotated with respect to said cap.

2. A locking closure cap for a fuel tank which has a flange with openings therein including: a lock adapted to be operated by a key, a retaining member carried by said cap and having means fitting in said openings in said flange and movable under said flange for holding said cap against removal, an actuating plate secured to the bottom of said lock and having depending opposed ears, anchoring members contacting said actuating plate and having apertures at their inner ends for receiving said ears, said anchoring members being slotted near their outer ends, guide studs carried by said cap and passing through the slotted ends of said anchoring members, the anchoring members being movable from a retracted to an extended position by rotation of said lock whereby said anchoring members may be moved to and from an engaging position with the openings in said flange.

3. A locking closure cap for a fuel tank which has a flange with an opening therein including: a lock adapted to be operated for locking engagement with said cap, retaining means on said cap adapted to be received by said opening and fit under said flange when in an engaging position, an anchoring member carried by said cap and adapted to fit in said opening in said flange and actuated by said lock for movement to and from an anchoring position with respect to said opening, and said anchoring member having an inclined face for engagement with the side of said opening in said flange whereby said anchoring member will be automatically withdrawn from said opening in said flange when said lock is released and said cap is rotated in the direction for removal, said locking and anchoring means when in an engaging position providing means for holding said cap against rotation and removal.

4. A locking closure cap for a fuel tank which has a flange with openings including: a lock adapted to be operated for locking engagement with said cap, retaining means on said cap adapted to fit in said openings and under said flange when in an engaging position, a plurality of anchoring members actuated by said lock and movable to and from anchoring engagement with said openings, said anchoring members radiating outwardly from said lock and having inclined edges contacting with the sides of said openings in said flange for causing said anchoring members to automatically move inwardly out of anchoring engagement with said openings as said cap is rotated in a direction for removal after said lock is released, said retaining and anchoring means when in an engaging position providing means for holding said cap against rotation and removal.

5. A locking closure cap for a fuel tank which has an inturned flange with openings therein including a cylinder lock adapted to be operated by a key, a retaining member carried by said cap and having flange-engaging means fitting in

said openings in said flange and movable under said flange for holding said cap against removal, an actuating plate secured to the bottom of said cylinder lock and having depending opposed ears, anchoring members contacting said actuating plate and having apertures at their inner ends for receiving said ears, said anchoring members being slotted near their outer ends, guide studs carried by said cap and passing through the slotted ends of said anchoring members for limiting the outward swinging movement of the anchoring members, the anchoring members being movable from a retracted to an extended position by rotation of said cylinder lock whereby said anchoring members may be moved to and from an engaging position with respect to said openings in said inturned flange, said anchoring members being fitted between said actuating plate and said retaining member and extending in a bias direction with respect to said flange-engaging means, and said retaining member having arc-shaped slots through which said opposed ears extend.

6. A locking closure cap for a fuel tank which has an inturned flange with openings therein including a cylinder lock adapted to be operated by a key, a retaining plate carried by said cap and having flange-engaging means fitting in said openings in said flange and movable under said flange for holding said cap against removal, an actuating plate secured to the bottom of said cylinder lock and having depending opposed ears, anchoring members contacting said actuating plate and having apertures at their inner ends, guide studs carried by said cap and passing through the slotted ends of said anchoring members, for limiting the outward swinging movement of the anchoring members, the anchoring members being movable from a retracted to an extended position by rotation of said cylinder lock whereby said anchoring members may be moved to and from a locking position with respect to said openings in said inturned flange, said anchoring members being fitted between said actuating plate and said retaining plate and extending in a bias direction with respect to said flange-engaging means, said retaining plate having arc-shaped slots through which said opposed ears extend, said retaining plate having a depending peripheral flange, and said depending peripheral flange having slots formed therein through which said anchoring members extend.

7. A locking closure cap for a fuel tank which has an inturned flange with openings therein including a cylinder lock adapted to be operated by a key, a retaining member carried by said cap and having flange-engaging arms fitting in said openings in said flange and movable thereunder for holding said cap against removal, anchoring members operable by said cylinder lock and movable to and from an engaging position with said openings of said flange for anchoring said cap against unauthorized removal, said cap having a depending integral barrel for receiving said cylinder, locking means for locking said cylinder lock within said barrel, a depending collar concentrically mounted with respect to said barrel and spaced therefrom, blocks arranged in opposed relation between said barrel and collar, and means for anchoring said anchoring member in engagement with said blocks.

8. A locking closure cap for a container which has a flange with openings therein, including: retaining means on said cap adapted to be received by said openings and moved under said

flange by rotation of said cap to lock it upon said container; anchoring means on said cap movable in and out with respect to the center thereof and adapted, in its outer position, to be received by one of said openings, said anchoring means being so constructed and arranged that rotation of said cap in the direction for removal causes said anchoring means to move inwardly toward the center of said cap and out of said openings; means for effecting outward movement of said anchoring means; and means for locking said anchoring means in outer position to anchor said cap against rotation and removal.

9. A locking closure constituting a cap for a fuel tank which has a flange with openings therein, including a locking mechanism, said locking mechanism comprising a cylinder mounted within said cap and adapted to be operated by a key, a retaining member carried by said cap and having depending legs fitting in said openings in said flange and movable under said flange for holding said cap against removal, an actuating plate adapted for limiting the rotation of the key secured to the bottom of said cylinder and having depending ears, anchoring members contacting said actuating plate, and having apertures at their inner ends for receiving said ears, said anchoring members being slotted near their outer ends, and guide studs carried by said cap and passing through the slotted ends of said anchoring members for limiting the outward swinging movement of the anchoring members, the anchoring members being movable from a retracted to an extended position by rotation of said cylinder.

10. A locking closure constituting a cap for fuel tank filler necks which have flanges with openings therein; including a cylinder adapted

to be actuated by a key, a retaining member provided with extending arms carried by said cap, said arms of said retaining member adapted to fit under said flange for holding said cap against removal, an actuating plate adapted for limiting the rotating movement of the key secured to said cylinder and having depending ears, anchoring members provided with apertures for receiving said ears, said anchoring members being slotted, guide studs carried by said cap adapted to pass through said slotted portions of said anchoring members for controlling the movement of said anchoring members, said anchoring members being movable from a retracted to an extended position by rotation of said cylinder, said retaining member provided with a depending peripheral flange having openings therein through which said anchoring members extend adapted to fit snugly within said filler necks and adapted to lock said cap upon various sized filler necks against removal by unauthorized parties.

11. A locking closure cap for a container which has a flange with openings therein, including: means on said cap adapted to be received by one of said openings and adapted to engage the flange after entering the opening and when the cap is rotated to prevent removal of said cap; anchoring means carried by said cap and adapted to be received by said openings, said anchoring means having means for moving said anchoring means inwardly toward the center of said cap and out of said openings when said cap is rotated in one direction for removal; means for effecting outward movement of said anchoring means; and means for locking said anchoring means in an outer position to anchor said cap against rotation and removal.

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