

Sept. 10, 1935.

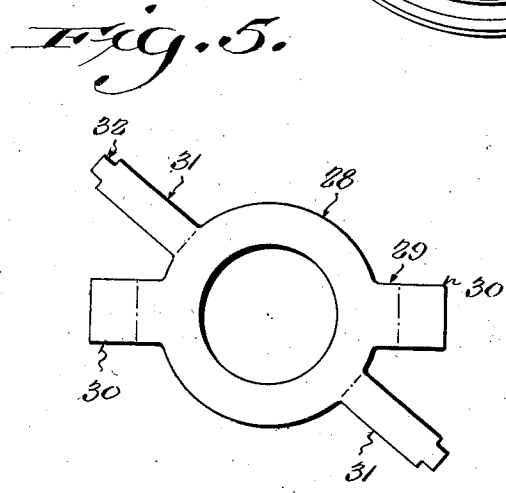
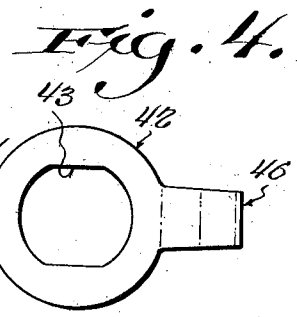
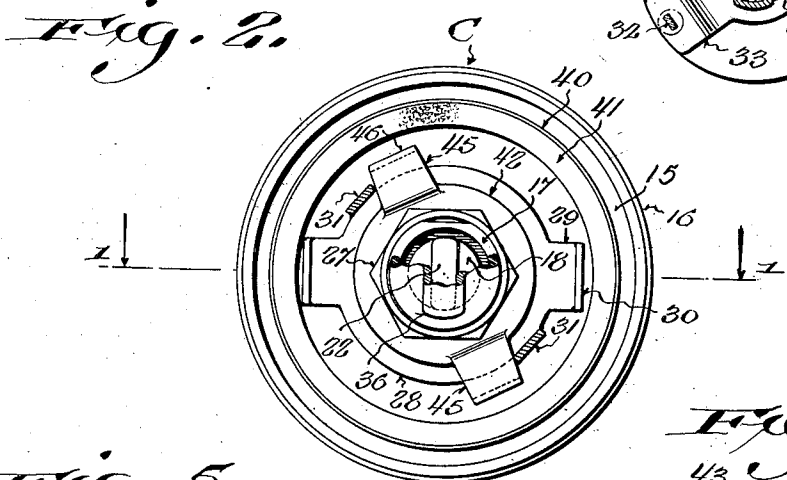
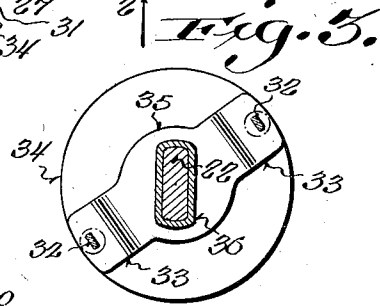
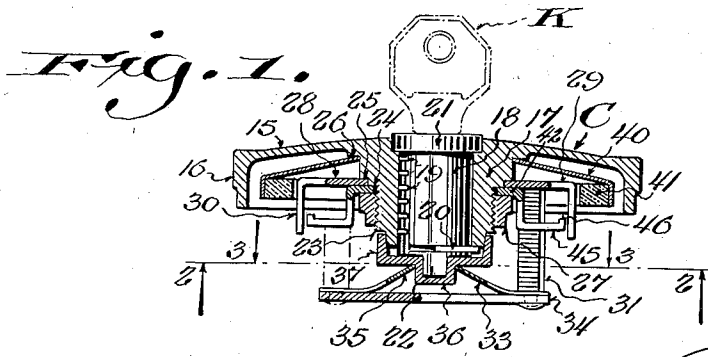
R. B. IVANDICK

2,014,134

LOCKING GAS CAP

Filed March 25, 1935

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 6.

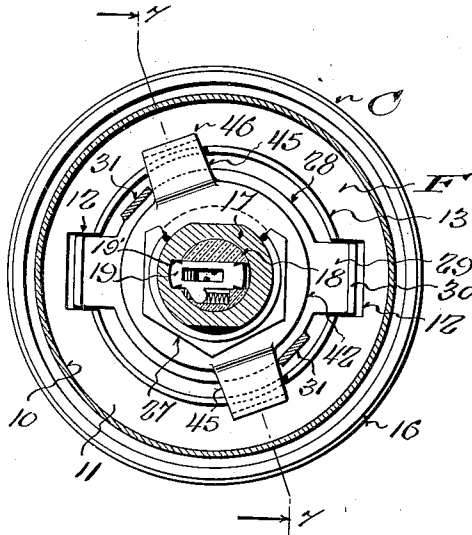
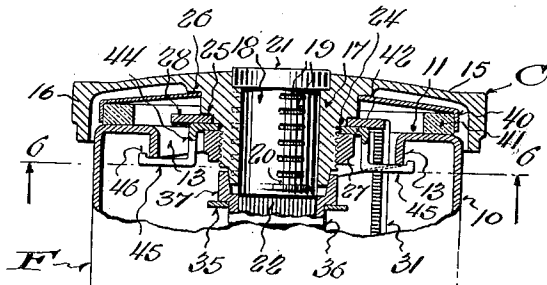



Fig. 7.



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UNITED STATES PATENT OFFICE

2,014,134

LOCKING GAS CAP

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10 Claims. (Cl. 70—90)

This invention appertains to closure locks, and more particularly to a novel locking cap for the gasoline tanks of motor vehicles to prevent the theft of gasoline from the tank, or the refilling of the tank should attempt be made by unauthorized persons to use the vehicle.

In gasoline locking caps, it is ordinarily customary to provide the cap with depending rigid fingers for engaging in the notches of the filling neck to prevent rotation of the cap on the neck, and then to provide a key-operated lock bar for engaging under the inclined flanges of the neck. Such a structure is shown in Patent No. 1,986,203, issued January 1, 1935. While this type of cap is serviceable, and performs its desired office, the structure is open to some objection, in that undue stress on the key is exerted in the moving of the lock bar under the flanges of the filling neck, and the key is subjected to breakage. In other types, to lock the cap, neither the lock bar nor the rigid fingers are engageable with the notches in the neck to prevent rotation of the cap, but the locking bar is merely moved out of alinement with the fingers so that the fingers and bar cannot be simultaneously alined with the notches. This type of cap is also open to objection, in that the cap is freely rotatable on the neck, which allows persons to tamper with the cap, and the cap is subjected to vibration when the vehicle is in use. It is therefore a prime object of my invention to provide a lock cap for the filling necks of gasoline tanks, comprising rigid fingers carried directly by the cap for movement under the flanges of the filling neck, and lock fingers rotatable on the cap for engaging in the notches of the filling neck, with means for locking the cap against rotation relative to the lock fingers after the cap has been turned to move the first fingers under the flange of the neck.

Another important object of my invention is the provision of novel means for associating the key plug of a cylinder lock with the cap, and novel means for mounting the flange engaging fingers, and the notch engaging fingers on the cap, whereby the parts will be easy to assemble and form, and whereby the cap itself can be rotated to move the flange engaging fingers to a holding position, and thereafter lock the cap against further rotation relative to the notch engaging fingers.

A further important object of my invention is the provision of novel means for associating the sealing gasket of the cap therewith, and relative to the notch and flange engaging fingers, so that movement of the gasket will be permitted

to allow the flange engaging fingers to engage under flanges of different heights.

A further salient object of my invention is the provision of novel means for forming the terminals of the flange engaging fingers, whereby lateral shifting movement of the fingers on the flanges will be prevented so that tilting of the cap cannot be brought about by the use of rigid instruments.

A still further object of my invention is the provision of novel means for forming a bearing for the notch engaging fingers and for connecting the notch engaging fingers with the key plug of the cylinder lock, said connection forming a bearing and sealing cup to prevent flow of fluid through the cap.

With these and other objects in view, the invention consists in the novel construction, arrangement, and formation of parts, as will be hereinafter more specifically described, claimed, and illustrated in the accompanying drawings, in which drawings:

Figure 1 is a diametric section through a cap for the filling neck of a gasoline tank, constructed in accordance with my invention, the view being taken substantially on line 1—1 of Figure 2, looking in the direction of the arrows, but showing the cap in its unlocked position.

Figure 2 is a horizontal section taken substantially on the line 2—2 of Figure 1, looking in the direction of the arrows, but showing the cap in its locked position.

Figure 3 is a horizontal section taken substantially on the line 3—3 of Figure 1, looking in the direction of the arrows.

Figure 4 is a plan view of the blank from which the fingers for engaging under the neck flanges are formed.

Figure 5 is a plan view of the blank from which the notch engaging fingers are formed.

Figure 6 is a horizontal section through the cap taken substantially on the line 6—6 of Figure 7, looking in the direction of the arrows, showing the cap applied to the filling neck of an automobile gasoline tank, the cap being shown in its locked position.

Figure 7 is a central section through the cap, taken substantially on the line 7—7 of Figure 6, looking in the direction of the arrows, the cap being shown in locked position and applied to the filling neck, the neck being shown broken away and in section.

Referring to the drawings in detail, wherein similar reference characters designate corresponding parts throughout the several views, the

letter C generally indicates my improved cap, and F the filling neck of a tank with which the cap can be associated.

The filling neck F can be of the usual construction generally employed in connection with the gasoline storage tanks of automobiles, and, as shown, the same includes the cylindrical neck portion 10 having the inturned annular flange 11 on its upper edge, which is provided with diametrically disposed notches 12. The inturned flange 11 carries depending arcuate locking cam flanges 13, which lie on opposite sides of the notches 12. The high points of the cam flanges are oppositely disposed relative to one another.

The improved cap C can be constructed from any preferred material, and includes a top wall 15 having a depending annular peripheral skirt 16 for engaging about the neck F. The top wall 15 carries an axially disposed hub or barrel 17 for rotatably receiving the key plug 18 of a conventional cylinder lock. The key plug 18 is provided with the usual key-way for the reception of the key, whereby the key can actuate the plate or slide tumblers 19. These tumblers are normally urged toward the wall of the barrel 17 for movement into a tumbler groove 19' in said wall when the tumblers align therewith. The key K, shown in dotted lines in Figure 1, normally moves the tumblers inwardly against their spring means and away from the wall of the barrel and the tumbler groove 19'. The key plug 18 also carries a spring pressed tongue 20 adjacent to its inner end, which is adapted to spring under the barrel or hub 17 to prevent removal of the key plug from the cap.

It is proposed to utilize the ignition key of the automobile for the lock cap, so that the driver of the vehicle will not be called upon to carry a large number of keys. Thus when the cap is purchased, the key plug 18 is separate therefrom, and the buyer can insert his ignition key in the plug and file off any tumblers which project beyond the periphery of the plug. This permits him to use his ignition key with the lock, and after the tumblers have been filed the spring-pressed tongue 20 is held inwardly until the key plug is inserted in the barrel, and until the tongue rides past the barrel, at which time further insertion of the plug will be prevented by the outstanding annular rib 21 on the barrel. The key plug carries on its inner face the diametrically extending operating rib 22, and the connection of this rib with other parts of the lock will be later set forth.

The outer surface of the barrel or hub 17 is provided with a series of annular stepped shoulders indicated respectively by the numerals 23, 24, 25, and 26. The face of the hub 17 beyond the shoulder 23 is preferably tapered, for a purpose which will also be later set forth, and the face between the shoulders 23 and 24 is provided with external threads for the reception of a lock nut 27. Rotatably mounted on the shoulder 25 is an annular plate 28 having radially extending arms 29, on which are formed the depending legs 30. The legs 30 are adapted to engage in the notches 12 of the filling neck of a gas tank.

Also, formed on the annular plate 28 are depending arms 31 terminating in lugs 32, which are adapted to extend through openings formed in arms 33, and a disc 34. The arms 33 are formed on a perforated plate 35, which receives the polygonal end 36 of a cup 37. The cup 37 is snugly fitted upon the tapered lower end of the hub 17, and this polygonal portion 36 receives

the diametrically extending rib 22 of the key plug. In view of the connection of the cap 37 with the key plug, and with the disc 34, the notch engaging legs 30 are rotatable with the key plug. The connecting lugs 32 have their extreme lower end upset so as to prevent separation of the arms 31 from the disc 34, and the arms 33.

Fitted on the shoulder 26 is a concavo-convex disc 40 preferably formed from resilient material. The periphery of the disc 40 carries a gasket 41 formed from cork or composition, and this gasket is adapted to fit on top of the filling neck to effectively seal the tank to prevent loss of fluid therefrom.

Rigidly mounted below the disc or annular plate 28 is the lock disc or plate 42. This plate is fitted against the shoulder 25, and is held rigid against said shoulder by the lock nut 27, so that rotation of the annular plate 42 will be prevented. In order to insure that the plate will be held against rotation, the opposite sides of the hub 17 can be flattened, and the opposite sides of the bore of the annular plate 42 can be provided with straight sides 43 for engaging said flattened faces. Formed on the annular plate 42 are depending arms 44, which in turn carry the radially extending legs 45. These legs are adapted to engage under the cam flanges 13 of the filling neck.

If preferred, the outer ends of the legs 45 can be provided with upstanding feet or lips 46 for engaging inside of the flanges 13, so that shifting movement of the cap on the neck will be absolutely precluded. In view of the fact that the gasket 41 is resiliently carried, the arms or legs 45 will frictionally engage under the cam flanges of the filling neck, and hence the cap will be held tightly in place, and the cap can also be utilized with necks having cam flanges of slightly different heights.

By referring to Figures 4 and 5, it can be seen that the locking arms are formed integral with the plate 42, and from a single stamping, and that the arms 29 and 31 are formed integral with the annular plate 28 and from a single stamping. This reduces the cost of manufacture, and also insures the proper connection of various parts.

In use of my improved cap, the same is placed on the filling neck in the usual manner, with the key K in the key plug 18, so that the arms 30 will be aligned with the legs 45. This will permit the insertion of the arms 30 and the legs 45 simultaneously through the notches 12. The operator can now press down on the cap and rotate the same bodily. As the arms 44 and legs 45 are rigidly connected with the hub of the cap, said arms 44 and legs 45 will be carried with the cap and under the cam flanges 13. The arms 30 will be held against rotation due to their engagement with the walls of the notches 12, and rotation of the cap relative to these arms 13 is permitted, in view of the fact that the arms are rotatably mounted on the hub of the cap.

When the cap has been rotated a quarter of a turn, the tumblers 19 will be in alignment with the tumbler groove 19' and upon removal of the key the tumblers will be projected into said keeper recesses, and thereby effectively hold the cap from further rotation on the plate 28. Hence, alignment of the arms 44 and legs 45 with the depending legs 30 will be prevented, and thus unauthorized removal of the cap from the filling neck cannot be accomplished. When it is desired to remove the cap from the neck, it is merely necessary to again insert the key K into the key-

way of the key plug 18, which will force the sliding tumblers into the key plug, and out of engagement with the walls of the tumbler groove 19'. The cap C can now be turned around the key plug, and on the annular plate 28 so that the arms 44 and legs 45 can again be brought into alinement with the arms 30 and the notches 12 of the neck, at which time removal of the cap can be permitted.

By this arrangement and construction, the key K is not utilized for rotating a locking bar under the cam flanges, and hence there is no strain on the key, or on the parts of the lock, and it can be seen that the cap itself is utilized for moving the lock bar under the flanges. By providing the cup 37, a seal is formed with the barrel or hub 17, which protects the lock against the flow of vapors therethrough. This is highly desirable, and the gasoline tank is vented at another point and not through the cap.

As the legs 33 are of spring material the cup 37 is at all times urged toward the key plug 18 and on its tapered seat on the hub or barrel 17.

Changes in details may be made without departing from the spirit or scope of this invention, but what I claim as new is:—

1. A lock cap for the filling necks of gasoline tanks comprising a body having a depending hub, radially extending arms rigidly connected with the hub for movement under the cam flanges of the filling neck, notch-engaging fingers movably mounted on the hub, and key-operated means for locking said last mentioned fingers and the body against relative movement.

2. A lock cap for the filling neck of gasoline tanks comprising a body having a depending peripheral rim and an axially disposed hub, a resilient concavo-convex disc connected at its center on the hub, a sealing gasket carried by the periphery of the resilient concavo-convex disc, a lock bar having radially extending arms for engaging under the flanges of a tank filling neck rigidly mounted upon the hub for movement therewith, the gasket being movable relative to said lock bar, and radially extending arms rotatably mounted on the hub for engaging in the notches of the tank filling neck.

3. A lock cap for the filling neck of gasoline tanks comprising a body having a depending peripheral rim and an axially disposed hub, a resilient concavo-convex disc connected at its center on the hub, a sealing gasket carried by the periphery of the resilient concavo-convex disc, a lock bar having radially extending arms for engaging under the flanges of a tank filling neck rigidly mounted upon the hub for movement therewith, the gasket being movable relative to said lock bar, radially extending arms rotatably mounted on the hub for engaging in the notches of the tank filling neck, and means for locking the cap against rotation relative to said last-mentioned arms.

4. A lock cap for the filling necks of gasoline tanks comprising a body having a depending hub, radially extending arms rigidly connected with the hub for movement under the cam flanges of the filling neck, notch engaging fingers rotatably mounted on the hub, and key-operated means for locking said last-mentioned fingers and the body against relative rotation.

5. The combination with the neck of a filling tank having a depending flange and notches on each side of the flange, of a lock cap for said neck including a body having an axially disposed hub, radially extending arms rigidly connected with

said hub and movable through said notches and under the flanges upon rotation of said body, depending fingers rotatably mounted on said hub and movable in said notches, and means for locking the cap and said last-mentioned fingers against relative movement when the lock fingers are under the flange of the neck and out of alinement with the last-mentioned fingers.

6. The combination with the filling neck of a storage tank having an inturned flange provided 10 with oppositely disposed notches and cam flanges lying on opposite sides of the notches, of a lock cap for the neck including a body having outwardly extending arms carried by a central portion thereof for insertion through said notches 15 and under the cam flanges by rotation of said body, and depending arms carried by the central portion of the body for swinging movement relative thereto for engaging the walls of the notches, and a cylinder tumbler lock for holding 20 the last-mentioned arms and the body of the cap against relative swinging movement when the first-mentioned arms are under said cam flanges.

7. A lock cap for the filling necks of gasoline tanks comprising a body having an annular rim and an axially disposed inwardly directed hub, the outer face of the hub being provided with a series of stepped shoulders, an annular plate rotatably mounted on one of said shoulders having 30 depending arms for engaging in the notches of the filling neck of a gasoline tank, a second annular plate rigidly held on the hub against another of said shoulders having depending arms and radially extending legs on said arms movable through the notches and under the flanges 35 of the neck, a cylinder lock including a key plug rotatably mounted in said hub, means connecting the rotatable key plug with the annular plate rotatably mounted on said hub, and said hub 40 having means for receiving the tumblers of the key plug when the arms of the two annular plates are out of alinement.

8. A lock cap for the filling necks of gasoline tanks comprising a body having an annular rim 45 and an axially disposed inwardly directed hub, the outer face of the hub being provided with a series of stepped shoulders, an annular plate rotatably mounted on one of said shoulders having depending arms for engaging in the notches of 50 the filling neck of a gasoline tank, a second annular plate rigidly held on the hub against another of said shoulders having depending arms and radially extending legs on said arms movable through the notches and under the flanges of 55 the neck, a cylinder lock including a key plug rotatably mounted in said hub, means connecting the rotatable key plug with the annular plate rotatably mounted on said hub, said hub having means for receiving the tumblers of the key plug 60 when the arms of the two annular plates are out of alinement, and a concavo-convex disc mounted on another shoulder of said hub, a gasket carried by the periphery of said concavo-convex disc, said disc being resilient, whereby movement be- 65 tween the gasket and the arms is permitted.

9. A lock cap for necks of gasoline storage tanks comprising a body having an annular rim and an axially disposed hub, a cylinder tumbler lock including a key plug rotatably mounted in said 70 hub, the hub having means for receiving the tumblers when the plug is in a predetermined position, a cup mounted upon the inner end of the key plug for movement therewith and rotatably mounted on the inner end of the hub for 75

closing and sealing the bore of said hub, an annular plate rigidly secured to the hub having radially extending legs for movement through the notches in a filling neck and under the flanges of the filling neck, a rotatable annular plate on said hub having depending arms for engaging in said notches, means rigidly connecting the last-mentioned plate to the cup, whereby said last-mentioned plate can be locked on said hub against movement.

10 10. A lock cap for the filling necks of gasoline storage tanks comprising a body having a peripheral rim and an axially disposed hub, a cup rotatably mounted on the inner end of said hub having a diametrically extending hollow boss, a tumbler cylinder lock including a rotatable key

plug mounted in said hub having a diametrically extending rib on its inner end received in said hollow boss, a disc disposed below said head, means connecting the disc with the head, an annular plate rigidly secured on said hub having depending arms on its periphery for engaging in the notches of a filling neck and depending legs rigidly connected with the disc, and an annular plate rigidly secured on said hub having formed thereon depending arms and radially extending legs for movement through the notches in said neck and under the flanges of said neck, and upwardly directed feet on said legs for engaging the inner faces of said flange.

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