Dec. 1, 1942. S. WISE 2,303,594

LOCK PROTECTED FILLING CAPS FOR LIQUID FUEL TANKS

Filed March 11, 1940 2 Sheets-Sheet 1

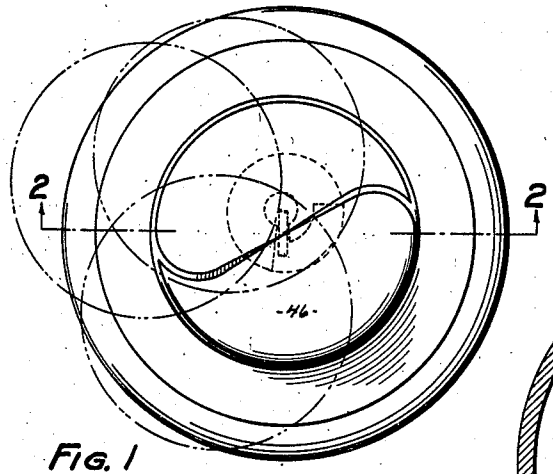



FIG. 1

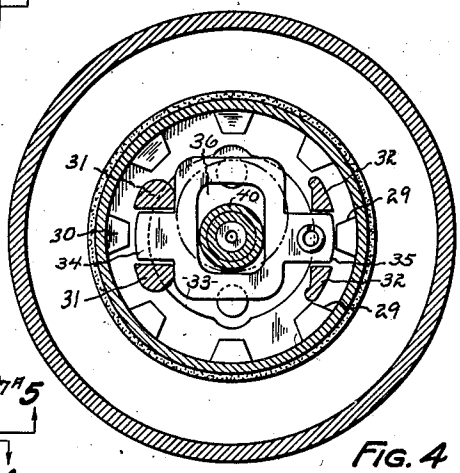



FIG. 4

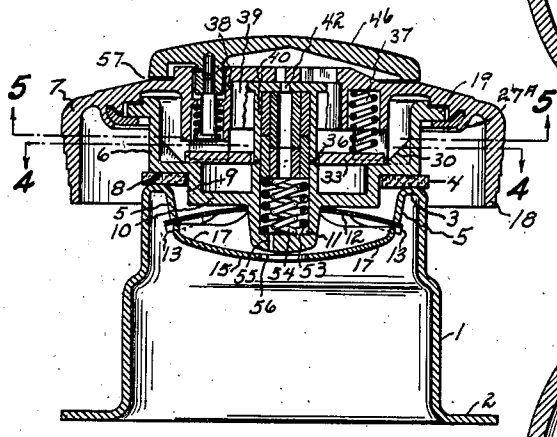



FIG. 2

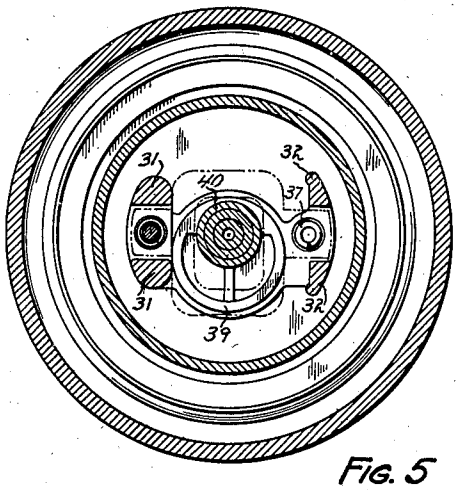



FIG. 5

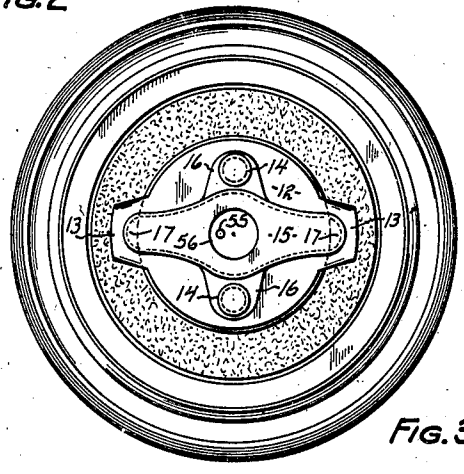



FIG. 3

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LOCK PROTECTED FILLING CAPS FOR LIQUID FUEL TANKS

Filed March 11, 1940 2 Sheets-Sheet 2

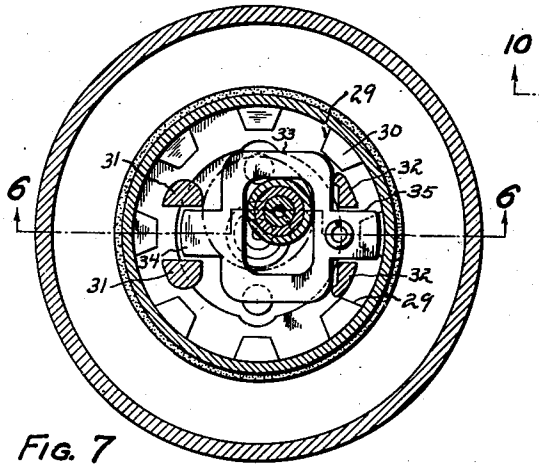



FIG. 7

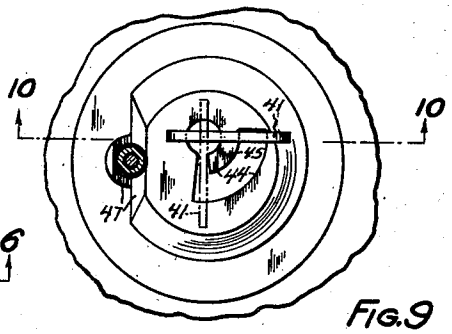



FIG. 9

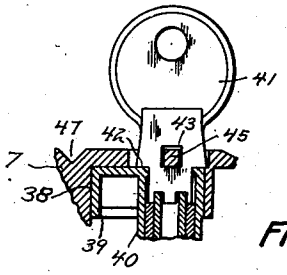



FIG. 10

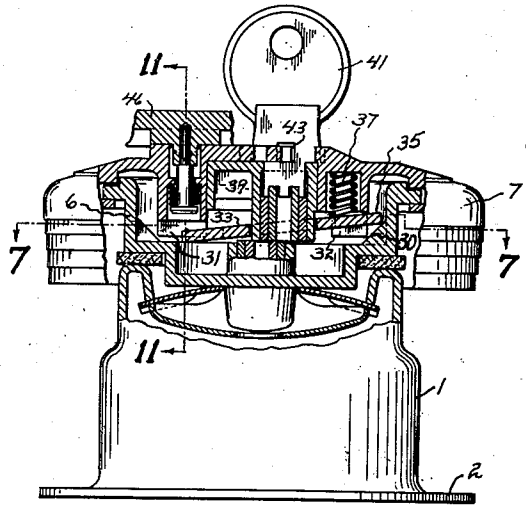



FIG. 6

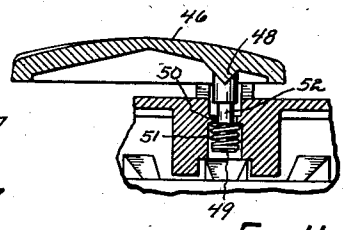



FIG. 11

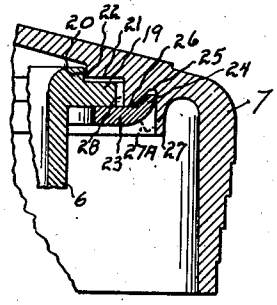



FIG. 12

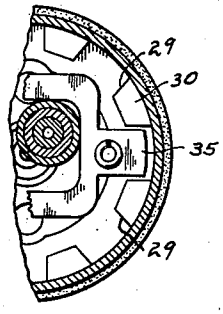



FIG. 8

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# UNITED STATES PATENT OFFICE

2,303,594

## LOCK PROTECTED FILLING CAP FOR LIQUID FUEL TANKS

Solomon Wise, Cleveland, Ohio

Application March 11, 1940, Serial No. 323,291

11 Claims. (Cl. 70—165)

This invention relates to filling caps for gasoline or like liquid fuel tanks, such for example as those provided on automotive vehicles, and to such caps having key-operated locks to prevent their unauthorized removal.

As is well known, the gas or other liquid fuel tank of an automotive vehicle or the like is filled through a tube or stem, which is thereafter closed by a detachable cap to keep out dust and other foreign material and to seal the tank to prevent escape or evaporation of the fuel, the cap being constructed to bleed air into the tank to maintain it at atmospheric pressure to facilitate feeding of the fuel to the engine.

It has been proposed to provide such filling caps with key-operated locks to prevent their unauthorized removal, one purpose being to prevent the theft of the liquid fuel.

The lock protected cap of the present invention embodies improvements over prior caps of this general class as will be explained hereinafter.

It is among the objects of the present invention:

To provide an improved filling cap of the class referred to which may be attached to and detached from the filling stem of a tank by rotating it thereon, and which, after it has been rotated to attach it, may be locked by a key-operated lock, and thereby the outer accessible parts of the cap are freed, so that if rotated, they rotate freely without detaching the cap;

To provide an improved tank filling cap of the lock-protected type, provided with a removable key to lock it, the key hole of which is covered or uncovered by a dust cap which is self-centering to hold it in keyhole uncovering or keyhole covering position in an improved manner, and which dust cap on being moved from keyhole covering position automatically moves away from the parts surrounding the keyhole whereby it is prevented from adhering thereto by frost, dirt, etc.;

To provide a filling cap of the lock protected type, having a key operated lock the key of which cannot be removed except when it is in the position to lock the cap against removal;

To provide a filling cap mechanism of the lock protected type, having a key operated lock the key of which is interlocked with the parts of the mechanism when in unlocked position, so that it cannot be removed except when it is has been operated to lock the cap;

To provide an improved means for assembling the parts of a lock protected filling cap, and an improved construction of the parts thereof to facilitate the said method of assembling;

To provide an improved arrangement of parts of a lock protected filling cap mechanism and an improved means of assembling said parts whereby said mechanism parts may be made from die cast metal without the necessity of removing the parting line fin formed thereon by the die casting process;

To provide an improved filling cap of the lock protected class having outer accessible cap parts which are freely rotatable when locked, and which may be key operated to set a lock mechanism which will audibly snap into one of a plurality of unlocked positions upon subsequent rotary movement of the outer cap parts to render the cap removable upon rotation of the outer accessible parts;

To provide a filling cap having an outer part which is freely rotatable when locked and provided with a locking tongue arranged to register with a plurality of locking teeth and which may be moved into position to engage the teeth whether it is in registration therewith or not;

To provide a filling cap having a freely rotatable outer part, which may be unlocked by a locking tongue upon movement thereof into position to be engaged with one of a plurality of locking teeth upon rotation of the outer cap part, by means of a spring element which spring element also functions to prevent loose rattling of the tongue;

To provide a filling cap having an improved means of the bayonet joint type for engaging it with the filling stem of a tank, and provided with improved resilient means of the follow-up type for maintaining the engagement, and provided with improved means for preventing yielding of the resilient means beyond a predetermined degree;

To provide a filling cap of the rotary cover lock protected type provided with an improved inlet for air to the tank disposed to prevent the entrance of excess moisture through the mechanism of the lock and into the tank to which the cap is attached.

Other objects will be apparent to those skilled in the art to which my invention appertains.

My invention is fully disclosed in the following description taken in connection with the accompanying drawings, in which;

Fig. 1 is a top plan view of a filling cap embodying my invention and illustrating in broken line different positions which a key-hole cover thereof may assume;

Fig. 2 is a longitudinal sectional view taken from the plane 2—2 of Fig. 1, and illustrating the filling cap embodying my invention mounted upon the filling stem of a tank and with the parts in locked position, that is to say, with the outer enclosing portions of the cap freely rotatable to thereby prevent removal of the cap;

Fig. 3 is a bottom plan view of the parts of Fig. 2 but with the filling stem of that figure omitted;

Fig. 4 is a sectional view taken from the plane 4—4 of Fig. 2 and with the said filling stem omitted;

Fig. 5 is a sectional view taken from the plane 5—5 of Fig. 2;

Fig. 6 is a view similar to Fig. 2 but illustrating the parts thereof in the position which they assume when the outer covering part of the cap is in the unlocked position whereby upon rotating the outer covering part the cap as a whole may be rotated to remove it from the filling stem; this view illustrating the operation of the locking parts when a tongue thereof happens to be out of alignment with tooth spaces co-operating therewith;

Fig. 7 is a view taken from the plane 7—7 of Fig. 6;

Fig. 8 is a fragmentary view similar to a part of Fig. 7 but showing the locking tongue after it has been rotated with the outer covering part to snap into a co-operating tooth space;

Fig. 9 is a fragmentary view similar to Fig. 1 but with the keyhole covering cap of that figure removed and with a key in the key hole; and illustrating the means by which the key may be locked against removal in the unlocked position;

Fig. 10 is a fragmentary view taken from the plane 10—10 of Fig. 9;

Fig. 11 is a view which considered with Fig. 9, illustrates the construction by which the keyhole covering cap is caused to move axially away from the key-hole when rotated to uncover the keyhole;

Fig. 12 is a fragmentary view of an enlarged scale of a part of Fig. 2 illustrating a preferred step of assembling certain parts which I may employ.

As will become apparent hereinafter, the filling cap embodying my invention, and as illustrated in the drawing, comprises in general two parts, an attaching part and an outer accessible or covering part. These two parts are arranged to be connected together by a key-operated locking mechanism so that by rotating the outer part, the attaching part rotates therewith and may be secured to, or removed from the filling stem of a tank by the usual bayonet type attachment. When the lock is operated by a key to disconnect the two parts, the outer part may be freely rotated on the attaching part, whereby it is impossible to supply sufficient torque to the attaching part to detach it from the stem, thereby preventing unauthorized access to the tank through the stem. It follows that when the two parts are locked together, the cap as a whole can be removed, and when they are unlocked from each other, they cannot be removed, but as a matter of terminology, it is the "locked" condition of the parts which prevents removal of the cap and the "unlocked" position of the parts which permits the cap to be removed, and this use of the words "locked" and "unlocked" will be adhered to in the following, and has been so used hereinbefore.

Referring to the drawing, Fig. 1, I have shown at 1 the sheet metal stem customarily attached to a fuel tank by a flange 2 the upper end of the stem being rounded over as at 3 to provide a smooth annular end surface upon which a sealing gasket 4 may be pressed, and the sheet metal being rolled or pressed inwardly as at 5—5. The rolled-in portion 5 is is well known in such stems co-operates with the usual standard equipment cap having a T-head extending therefrom, the portion 5 having opposite notches downwardly through which the T may be projected and having cam surfaces over which the opposite arms of the T may be forced to draw the cap toward the stem, and compress a gasket such as the gasket 4 upon the end of the stem at 3 to seal it, the joint as thus commonly employed being in the nature of a bayonet joint and being so well known in this art as not to need further description or illustration herein.

At 6 is illustrated generally the attaching part of my improved cap, and at 7 is illustrated generally the outer or covering part thereof. The attaching part 6 has a transverse planar face 8 engaging the annular gasket 4 and a cylindrical portion 9 centering the gasket thereon, the cylinder being closed by an end 10 provided centrally with a spring and lock housing 11, the housing 11 being internally cylindrical and projecting externally downwardly from the closed end 10.

A sheet metal spring 12, best shown in Figs. 2 and 3, generally of circular form and provided with oppositely extending fingers 13—13 of downwardly open channel form, has a central perforation by which it is telescoped over the downwardly projecting housing 11, and is attached intermediately of the fingers 13—13 to the bottom 10 by rivets 14—14. In the preferred construction, a spring guard 15 is provided having wings 16—16 through which the rivets 14 pass, whereby the spring 12 is secured against the bottom 10 by the wings 16—16, and the guard 15 is provided with upwardly open channel form arms 17—17, the other ends of which are nested in the downwardly open channel form fingers 13 of the spring.

By this means, when the attaching part 6 of the cap is attached to the stem 1 by inserting the spring fingers 13—13 into the upper end of the stem, and rotating it to draw the part 6 downwardly to clamp the gasket 4 between the face 8 and the stem surface 3, the spring 12 is bent downwardly at the fingers 13—13 but is prevented from being distorted beyond its elastic limit by the fingers 17—17 upon which the spring fingers 13—13 abut; but the resiliency is maintained in the spring 12 so that if the gasket 4 should become set or yield, the spring 12 by tending to assume its original straight position will maintain a seal at the gasket nevertheless.

As shown in Figs. 2 and 6, the attaching part 6 of the cap is generally of upwardly open cup form. The covering part 7 is, as is also shown in these figures, of downwardly open cup form having a skirt 18 extending downwardly and around the inner parts of the cap structure to protect and guard the same against tampering; and the two parts of the cap are joined together in a manner to permit relatively rotary movement of the one on the other, by the following means, best shown in Figs. 2 and 12. The attaching part 6 has formed thereon an outwardly extending annular flange 19, and an annular cylindrical shoulder 20. The covering part 7 has a planar face 21 and an annular hollow cylindrical shoulder 22 co-operating with the flange 19 and

shoulder 20, to guide rotary movement of the covering part 7, and the attaching part 6, and these parts are held in co-operative position by an assembling ring 23. This ring, in the form of a shallow dish, has a skirt 24 at its periphery which at the time of assembling the parts is disposed in a groove 25 in the covering part 7, and the body of the ring 23 overlaps under the flange 19 and engages an annular bead 26 on the covering part 7. The covering part 7 is formed from metal having a desired degree of ductility, and I have found that suitable die-casting alloys may be used for this purpose; and when the part 7 is first formed, it has an annular rib 27 formed thereon and disposed to permit the ring 23 to be moved to its position illustrated in Fig. 12, described above, and then the rib 27 is bent inwardly to the position shown at 27A, clamping the skirt 24 of the ring 23 in the groove 25 and against the bead 26, rigidly securing it to the covering part 7 and disposing the body of the ring to trap the flange 19 between the ring 22 and the bead 26, and with the shoulders 20 and 22 adjacent, thereby providing a permanent rotary coupling between the attaching part 6 and the covering part 7.

The attaching part 6 is preferably formed from die cast metal and in this process a casting fin may form on the outer peripheral edges of the flange 19 and I have found that the necessity of removing such fins may be avoided if a space 28 is provided at the periphery of the flange 19 as shown in Fig. 12.

The rib 27 may be bent to the position 27A by a spinning or other operation, but I prefer to bend or force it in position to grip the ring 23 by a die-pressing operation, relative movement between the covering part 7 and the die being effected axially of the covering part 7, and die pressing operations of this type being well known it is not thought necessary to further illustrate or describe the same.

As stated above, locking means is provided to lock the two parts 6 and 7 together whereby when torque is manually applied to the covering part 7 to rotate it, it will rotate the attaching part 6 either to attach it to the stem 1 or to detach it therefrom depending upon the direction in which the covering part is turned; and after the attaching part is fastened to the stem 1, the covering part 7 may be unlocked from the attaching part and therefore will rotate freely when torque is applied thereto so that the torque is not transmitted to the attaching part 6 and therefore it cannot be removed. The rotary coupling connection between the two parts has been described in connection with Figs. 2 and 12, and the said locking means will now be described.

The attaching part 6 is provided internally thereof with an annular series of spaced apart lock teeth or jaws 29—29, eight being shown, see Figs. 4, 7 and 8, although any suitable or desired number may be provided.

A pair of guide posts 31—31 depend from the covering part, Figs. 4, 5, 6, and, transversely therefrom, a pair of posts 32—32 also depend from the covering part 7, and these pairs of posts function to position and guide a lock reciprocator 33, having at opposite ends thereof aligned fingers 34 and 35, the finger 34 being disposed between and guided by the posts 31—31 and the finger 35 disposed and guided by the posts 32—32.

The intermediate portion of the reciprocator 33 is in the form of a rectangular body, as shown in Figs. 4 and 7, and the reciprocatory movement of the reciprocator 33 is limited and stopped in each direction of reciprocation by engagement of this rectangle in one direction with the posts 31 and in the other direction with the posts 32, as shown respectively in Figs. 4 and 7; and the reciprocator has a rectangular perforation 36 therein.

A coiled spring 37 is seated in a recess in the covering part 7, and at its outer end presses upon the upper side of the reciprocator 33 resiliently holding it downwardly, and thus prevents rattling thereof and also performs a snap action to be referred to.

When the covering part 7 and attaching part 6 are in their "locked" positions the reciprocator 33 is in the retracted position of Figs. 2 and 4. To interlock the two parts together, that is "unlock" the device, the reciprocator is reciprocated toward the right, as viewed in the drawing, to the position of Fig. 8, or in the position of Figs. 6 and 7. If, when the reciprocator is thus reciprocated, the finger 35 should, as shown in Fig. 8, be thereby projected into the space between an adjacent pair of lock teeth 29, the interengagement of the finger with the teeth effects the interlock between the two parts prohibiting their relative rotation. If, however, at the time of reciprocating the reciprocator as above referred to, one of the teeth 29 should happen to be in alignment with the finger 35, the finger will ride up on the inclined face 30 of said tooth, taking up the position thereof in Figs. 6 and 7. Inasmuch as the locking operation is performed to permit detachment of the cap from the stem, the covering part 7 will now be turned by hand to detach the cap as a whole and this turning motion will first cause the covering part 7 to start to turn on the attaching part 6, but such movement will move the finger 35 with the covering part and after a small amount of movement, the finger 35 will snap down into the space between the next adjacent pair of teeth 29 and the two parts 6 and 7 will then be locked together. This positive snap action emits an audible click and is one of the advantages of my invention, as well as is the concurrent advantage of being able to move the reciprocator 33 to the locking position whether or not the finger 35 happens to be aligned with one of the spaces between the teeth 29. Obviously it is the spring 37 which effects this snap action.

The means for reciprocating the reciprocator 33 will now be described.

In a cylindrical recess 38 in the covering part 7 of the cap is rotatably disposed a cylindrical lock head 39, Figs. 2, 5, 6 and 10, and eccentrically with respect to the axis of rotation of the head 39 is an upper lock cylinder or skirt 40 formed on the head 39 and depending below the same. This hollow cylindrical skirt 40 extends downwardly into close proximity with the upper end of the cylindrical housing 11 above referred to and extends into the rectangular perforation 36 in the reciprocator 33. A flat sheet metal key 41 is provided which may be inserted through a key slot 42, Figs. 2 and 10, into the upper end of the head 39, and when the key is then turned it will rotate the lock head 39 on its axis causing the skirt 40 to move with an eccentric movement, for example from the position of Fig. 4 to that in Fig. 7 or Fig. 8, thereby reciprocating the reciprocator 33.

Key operated lock parts are provided within the skirt 40 and housing 11 and are in the form of a plurality of concentric cylinders which, in

the locked position of Fig. 2 for example, overlap both the skirt 40 and the housing 11 and prevent rotation of the lock head 39; but which as shown in Fig. 6, may be moved by insertion of the key 41 to dispose the ends of the cylinders in a plane common to the adjacent ends of the skirt 40 and housing 11 whereby the key 41 may be turned for the purposes described above.

The lock parts which I prefer to use do not in themselves constitue any essential part of the present invention, the same being the subject of my Patent No. 1,741,390, issued Dec. 21, 1929, for Improvements in locks, except in so far as they make possible the use of a symmetrical self-ejecting key, as will be described.

In order that the key 41 may be prevented from removal except when the parts are in the "locked" position, the following means is provided. As shown above, when the key is inserted into the skirt 40 at its upper end through the key slot 42, and is depressed to move the said locking cylinders to their unlocking positions, the application of rotary torque to the key 41 will rotate the lock head 39 and cause the key itself to move bodily with the skirt 40 with an eccentric movement around the axis of the lock head 39, and the key moving bodily from the broken line position to the solid line position, Fig. 9, and I utilize this bodily movement in the following manner.

The key is provided with a perforation 43 therein, Figs. 10 and 6. The upper surface of the covering part 7 is provided with a sector-form opening 44 through which the key sweeps bodily; and a tongue 45 of arcuate form is disposed in the opening 44 over which the perforation 43 telescopes when the key is turned. The tongue thus interlocks the key with the covering part 7 when the key is turned to the unlocking position and the key cannot be removed until it is turned again to the locking position.

By this means, when the key interlocks the parts together so that the cap may be removed from the stem, the operator of the device, whether it be the owner of the vehicle or the station attendant, cannot inadvertently remove the key with the danger that the cap will then be put on without locking it; and the key may be attached to the ignition key of the vehicle to further this purpose.

It is only after the cap has been again attached to the stem and locked that the key can be withdrawn, and this leaves the cap in the condition so that the covering part rotates freely and the cap cannot be removed.

By utilizing the above described lock-cylinder type of lock, a symmetrical key may be used, and the perforation 43 will be on its axis of symmetry, so that the perforation will telescope over the tongue 45 in every case. Furthermore, the lock-cylinder type of lock employed utilizes springs 53 and 54 in the housing 11 tending at all times to hold the lock cylinders outwardly toward the upper end of the skirt 40; and since these springs must be compressed by insertion of the key 41 to move the cylinders from the position of Fig. 2 to that of Fig. 6 in the operation of the lock, these springs also function to eject the key 41 when it is returned to "locking" position, the broken line position of Fig. 9.

The key opening 44 and the key slot 42 are covered by a cover cap 46 having the following construction.

The upper outer surface of the covering part 7 is provided with an upwardly concave V-notch 47 and the underside of the cap 46 is provided wth a downwardly convex V-bead 48 alignable and nestable therewith. A pin 52 having a head 49 is projected upwardly through a perforation 50 in the covering part with a spring 51, between the head 49 and the peripheral portions of the perforation 50, tending to hold the pin 52 downwardly; and the upper end portion of the pin is pressed into the cap 46 at a point in the apex of the V-shaped bead 48.

The pin 52 thus provides an axle upon which the cap 46 may rotate, and being disposed at one side of the center of the cap and laterally of the said key-opening, the cap can be rotated laterally to cover or uncover the said opening.

When the cap is in the closed position, it is centered thereat by the nesting of the bead 48 in the groove 47, and when torque is applied to it to rotate it to the open position illustrated in Fig. 11, the bead 48 rises up out of the groove 47 by a camming action and therefore elevates the cap above the covering part 7 of the cap. The cap thus has an axial movement when rotated and by this means when rotating it from the closed position to the open position is moved away from the underlying parts and therefore breaks away if it tends to stick, for example by frost. When moved to the closed position it is self-centering, the bead 48 snapping into the groove 47 and the bead 48 and groove 47 may be proportioned so that the bead will not bottom in the groove but will permit the peripheral or main portion of the cap to firmly engage the underlying parts, for example at 57, Fig. 2.

At 55, Figs. 2 and 3, I have shown a vent hole communicating with the interior of the tank through the stem 1, and access may be had thereto, for inspection, through a large perforation 56 in the spring guard 15; and the vent hole 55 communicates with the outside atmosphere through the housing 11, to the interior of the attaching part 6 and through the rotary coupling at 19, 28, 23 and downwardly under and through the skirt 18.

This communication between the tank interior and the outside atmosphere maintains the tank at atmospheric pressure, as fuel is withdrawn therefrom, and the said path of communication through the rotary coupling is of relatively great cross-sectional area and therefore of relatively small resistance to air flow inwardly therethrough; and the entrance of air through such path being upward, under the covered skirt 18, moisture even during a heavy rain, or snow cannot enter; and the only other path of entrance, namely through the keyhole 42, is closed and sealed by the cap 46; thus the accumulation of water in the tank is prevented.

My invention is not limited to the exact details of construction illustrated and described. Changes and modifications may be made within the spirit of my invention without sacrificing its advantages and within the scope of the appended claims.

I claim:

1. In a cap device for closing the filling opening of a tank or the like, an attaching part comprising means for attaching it to the tank and a covering part freely rotatably coupled to the attaching part; a lock mechanism operable by a key to lock the two parts together; the covering part comprising depending skirt portions surrounding and covering the attaching part; and coupling means permanently rotatably coupling

the parts together, said coupling means comprising coaxial annular surfaces associated with said parts respectively and in mutual engagement, and comprising integral portions of one of said parts forcibly deformed to permanently maintain said engagement.

2. In a device for closing the filling opening of a tank or the like, an attaching part comprising means for attaching it to the tank and a covering part freely rotatably coupled to the attaching part; a lock mechanism operable by a key to lock the two parts together comprising an element rotatable on an axis by rotation of the key; and means to prevent removal of the key except when the two parts are unlocked from each other comprising a perforation provided in the key and a circularly arcuate tongue on the covering part concentric with the said axis disposed to enter the perforation when the key rotates the rotatable element to the locking position.

3. In a cap device for closing the filling opening of a tank or the like, an attaching part comprising means for attaching it to the tank and a covering part freely rotatably coupled to the attaching part; a lock mechanism operable by a key to lock the two parts together comprising a reciprocator on one said part and a circular series of spaced teeth on the other said part each having an upwardly inclined face; means responsive to turning of the key to cause the reciprocator to ride up on the inclined face of a tooth when disposed in alignment with the reciprocator; and spring means resisting riding-up movement of the reciprocator; whereby when the covering part is rotated on the said coupling the reciprocator is caused by the spring to snap into the space between a pair of adjacent teeth to lock the covering part to the attaching part.

4. In a cap device for closing the filling opening of a tank or the like, an attaching part comprising means to attach it to the tank, and a covering part; a rotatable connection between the two parts comprising mutually engaged annular portions; a ring for maintaining the said portions in mutually engaged relation; and a projection on one said part bent to permanently overlap the ring and hold it in said maintaining position.

5. In a cap device for covering and sealing the filling opening of a tank or the like of the type provided with inclined planes on the tank adjacent to the opening and a sealing gasket at the opening; a sheet metal spring having opposite fingers engageable with the inclined planes upon rotation of the device to draw the device resiliently toward the opening to sealingly yieldingly press the gasket thereupon; a head on the device disposed outwardly of the spring to limit yielding of the spring; and attaching means projected through perforations in the head and then through perforations in the spring and secured to the device to attach the spring and head to the device.

6. In a cap device for closing the filling opening of a tank or the like, an attaching part comprising means for attaching it to the tank; a covering part coupled to the attaching part to rotate freely on an axis of rotation; a key operable lock mechanism to lock the two parts together and comprising a series of radially inwardly extending teeth with recesses therebetween on one part arranged about said axis, a tongue loosely guided on the other part to reciprocate generally radially thereon toward and from the teeth and recesses, means operated by a key to reciprocate the reciprocator and to move the tongue into a recess or into engagement with a tooth, whichever happens to be aligned with the tongue, the tongue and the tooth at their mutually engaged portions being relatively formed so as to deflect the tongue in the general direction of said axis, and spring means reacting on the deflected tongue to restore it and cause it to move into a recess upon subsequent relative rotation of the attaching and covering parts.

7. In a cap device for closing the filling opening of a tank or the like, an attaching part comprising means for attaching it to the tank; a covering part freely rotatably coupled to the attaching part; a key operable lock mechanism to lock the two parts together and comprising a reciprocator movably supported by one part but unattached thereto and a plurality of teeth on the other part with tooth spaces therebetween; an upwardly inclined face on each tooth; means responsive to movement of a key to reciprocate the reciprocator to cause it to ride up on a tooth face aligned therewith; a spring reacting on the reciprocator to hold it against rattling under vibration and to yieldably engage it with the tooth face; the reciprocator being rotatably movable with the said covering part to move it from the inclined face to the adjacent tooth space; and the spring snapping it into said space.

8. In a cap device for closing the filling opening of a tank or the like, an attaching part comprising means for attaching it to the tank and a covering part having a peripheral skirt portion surrounding and covering the attaching part; means freely rotatably coupling the parts together; a lock mechanism operable by a key to lock the two parts together against rotation; the coupling means comprising mutually engageable annular shoulders on the two parts respectively to center them for relative rotation, an outwardly laterally extending annular flange on one part, an annular ring having a portion overlapping the flange, and an annular fin on the other part deformable by axially directed force to cause it to overlap the ring, said coupling means being disposed inwardly of and adjacent to the base of the said skirt portion.

9. In a device for closing the filling opening of a tank or the like, an attaching part comprising means for attaching it to the tank and a covering part freely rotatably coupled to the attaching part; a lock mechanism operable by a key to lock the two parts together when the key is inserted manually in the lock mechanism and then rotated in one direction, and to unlock them when rotated in the other direction; means to prevent removal of the key except when the two parts are unlocked from each other, and spring means acting to eject the key upon turning it manually to unlocking position.

10. In a device for closing a filling opening of a tank or the like, an attaching part comprising means for attaching it to the tank and a covering part therefor; a locking mechanism operable by a key to lock the two parts together comprising an element rotatable on an axis by rotation of the key; and means to prevent removal of the key except when the two parts are unlocked from each other comprising a perforation in the key and a tongue on the covering part disposed to enter the perforation when the key rotates the rotatable element to the locking position.

11. In a cap device for closing the filling opening of a tank or the like, an attaching part com-

prising means for attaching it to the tank and a covering part freely rotatably coupled to the attaching part; a lock mechanism operable by a key to lock the two parts together against rotation; the coupling means comprising mutually engageable annularly disposed shoulder portions on the two parts respectively to center them for relative rotation, an outwardly laterally extending flange on one part, a ring having portions overlapping the flange, and a fin on the other part deformable by axially directed force to cause it to overlap the ring.

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