O. P. SMITH.

CAP LOCK.

APPLICATION FILED MAY 10, 1920.

1,434,161. **Patented Oct. 31, 1922.**

Fig. 1.

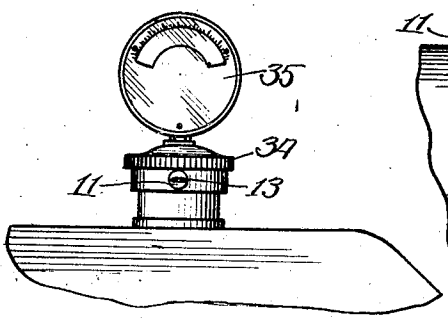


Fig. 7.

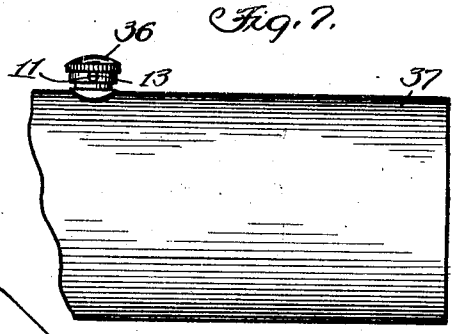


Fig. 2.

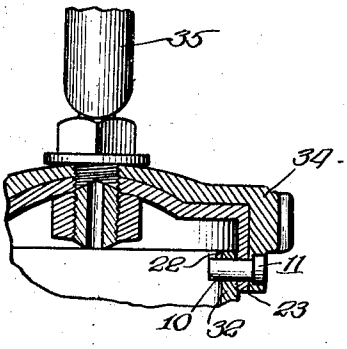


Fig. 3.

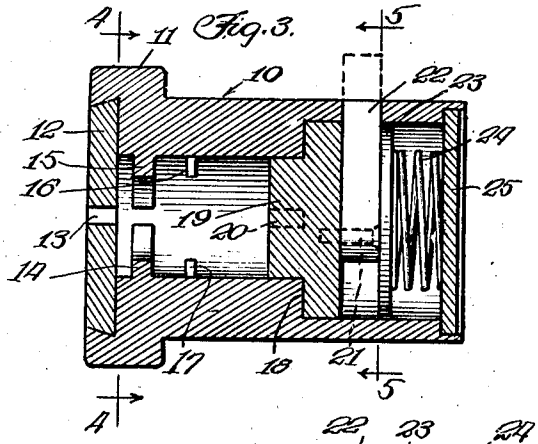


Fig. 4.

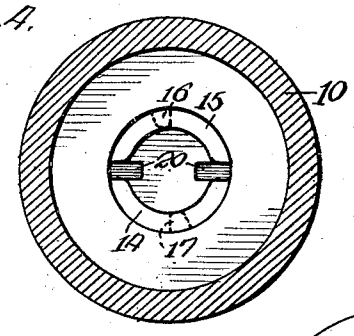


Fig. 6.

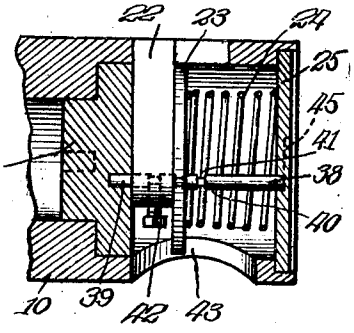
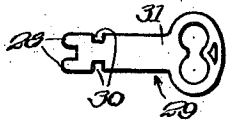


Fig. 8.



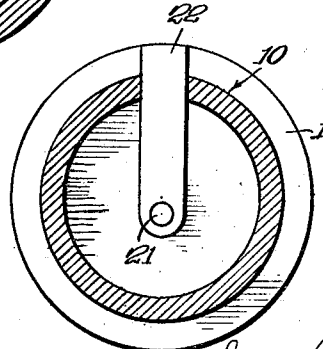


Fig. 5.

Inventor:
Oliver Preston Smith
by Jones, Addington, Ames & Seibold
Attys.

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UNITED STATES PATENT OFFICE.

OLIVER PRESTON SMITH, OF CHICAGO, ILLINOIS.

CAP LOCK.

Application filed May 10, 1920. Serial No. 380,055.

To all whom it may concern:

Be it known that I, OLIVER PRESTON SMITH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Cap Locks, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

This invention relates to an improved form of cap lock for securing the caps used to close the inlet and outlet apertures in tanks, cans, etc., to the body of the tank or can, and more particularly to a locking bolt which can be easily and efficiently applied to the radiator caps of automobiles equipped with motor meters.

One of the objects of this invention resides, therefore, in an improved form of lock used to securely lock the caps serving to close the inlet and outlet apertures of enclosures such as tanks, cans, etc., and consists in the production of an improved form of locking bolt which constitutes a physical entity and which can be very easily applied to any of the commercial forms of tanks or cans without any change or reconstruction of the tanks or cans.

Another object of the invention resides in the production of a locking device of this character which is very simple and which may be quickly installed with very little effort.

Another object resides in the production of an improved form of locking device for this purpose, in which the key is held in the lock when said lock is turned to the unlocked position. This prevents loss of the lock when it is removed from its locking position and also tends to insure the replacing of the lock when the cap has been replaced over the enclosure opening.

The invention is particularly applicable and is of great commercial utility in the protection of motor meters, gasoline tank caps, etc. The motor meter is an expensive instrument and is applied to the radiator cap of an automobile, which cap in turn is simply screw-threaded to the radiator nipple. In a like manner, the caps of gasoline tanks are merely screw-threaded to the tank. Because of the ease with which these caps can be removed they constitute a great incentive for petty larcency. A simple, effective device for locking these caps to their respective enclosures is consequently desirable. Various devices have been constructed for this purpose but they have not been found practical or commercial because they either necessitate the reorganization and design of the cap or nipple, or both, or they are of such a character and design which makes them rather expensive per se and expensive to install.

The cap lock constructed in accordance with this invention is designed to obviate and eliminate these difficulties and this is accomplished by making the entire lock in the form of a locking bolt, the lock and bolt being a physical entity or unitary structure. The installation of this locking bolt is very simply and easily effected, and comprises merely the drilling of aligned apertures in the cap and the nipple surrounding the enclosure opening, into which apertures the locking bolt is inserted. The installation of this form of lock consequently does not require the services of a special mechanic, as it requires no reorganization, the operation of installing consisting merely in drilling a hole through the cap and nipple when the cap has been screwed home on said nipple. The simplicity of this lock and the ease with which it can be installed makes it exceedingly attractive to motorists for the purpose of protecting the motor meter and the cap of the gasoline tank, the loss of which is exceedingly annoying. Furthermore the lock is so constructed that any gases which may be generated in the tank or enclosure will be substantially confined in said enclosure, and will thus not be permitted to escape through the lock mechanism into the atmosphere.

The specific embodiment of the invention herein illustrated and described shows the lock applied to a motor meter and gas tank cap, but the invention obviously is capable of other applications and many other variations, the scope of the invention being set out in the appended claims.

For the purposes of description several embodiments of my invention are illustrated

in the accompanying drawings, in which—

Fig. 1 is an illustration in front elevation of a portion of a radiator with the cap and motor meter in position on the radiator and the locking bolt in position to securely lock the motor meter to the radiator;

Fig. 2 is a view in section through the radiator nipple and the cap carrying the motor meter and shows the locking bolt in position for securing the cap to the nipple;

Fig. 3 is a longitudinal sectional view of the locking bolt;

Fig. 4 is a section taken on the plane indicated by the line 4—4 of Fig. 3 looking in the direction of the arrows;

Fig. 5 is a section taken on the plane indicated by the line 5—5 of Fig. 3 looking in the direction of the arrows;

Fig. 6 is a modified form of locking bolt in which means are provided for adjusting the position of the locking bar to adapt the locking bolt for caps and nipples of varying thicknesses;

Fig. 7 is an illustration in front elevation of the lock applied to a tank such as is usually used to carry the gasoline supply for an automobile; and

Fig. 8 is a plan view of the key that is used with the preferred form of lock illustrated in the figures.

Referring now to the drawings in detail, and more particularly to Fig. 3, it will be noted that the locking bolt comprises a housing 10 which carries the locking mechanism. The housing 10 is preferably cylindrical in shape and carries at its front end the enlarged flange 11 adapted to be inserted in a countersunk portion in the cap to which the bolt is to be applied. The housing 10 is fitted at its front end with a key admitting plate 12 which is fitted with a slot 13 to receive the key.

The housing 10, as clearly illustrated in Fig. 3, is a hollow cylinder and has fitted on its inner surface, at the front end thereof, the projecting circular segments 14 and 15. The segments 14 and 15 function to retain the key used for locking the bolt in position in the said lock when the same is in its unlocked position.

Positioned on the inner surface of the cylindrical housing, immediately in back of the segments 14 and 15, are the projecting lugs 16 and 17, said lugs serving to limit the movement of the key in the operation of turning the locking bolt to its locked position. These lugs consequently serve to indicate to the operator when the device has been turned to the locked as well as the unlocked position. The lugs also serve as a means for changing the character and construction of the key used to unlock and lock the mechanism as hereinafter described. The inner surface of the cylindrical housing 10 is fitted at 18 with a right angular shoulder, which is adapted to receive the key plate 19, which carries the slots 20 adapted to cooperate with the key for the purpose of locking and unlocking the mechanism. The key plate 19 is loosely fitted in the cylindrical enclosure 10 against the right angular shoulder 18.

Secured to the rear end of the key plate by means of a rivet 21 is the locking bar 22, the locking bar 22 being loosely fitted on the rivet 21. Directly in back of the locking bar 22 is a plate 23 which is held in position against the locking bar 22 by a spiral spring 24, said spring being held in compression between the plate 23 and the end plate 25. The end plate 25 serves to close the end opening of the cylindrical housing 10 and is positioned in a right angular shoulder at the end of said housing in any suitable manner. It will be evident from the description of the lock construction just completed, that any gases which may be generated in the tank or enclosure, such as gasoline vapors, steam, etc., will not be permitted to escape through the locking bolt mechanism, but will be substantially confined in the tank or enclosure. Thus the rear end of the locking bolt is sealed by the end plate 25 and the only opening into the locking bolt housing 10 is the slot cut into said housing to accommodate the locking bar 22. This slot is substantially closed by said locking bar 22 and such gases, which may gain admission into the housing 10 through the restricted opening which surrounds the locking bar 22, are prevented from escaping through the locking bolt into the atmosphere by the key plate 19, which divides and separates the housing 10 into two compartments. The key plate 19 serves the dual function of acting as a means through which the locking bar 22 is operated and as a means for preventing the escape of gases and liquids which may find their way into the rear compartment of the housing 10. The locking bolt consequently serves as an effective means for locking the cap, and this locking of the cap is accomplished without introducing any effective passage by way of which gases or liquids generated in the enclosure might escape to the atmosphere.

In Fig. 8 is shown the key which is adapted to lock and unlock the mechanism illustrated in Fig. 3. Obviously the commercial construction of this locking mechanism, the slots 20, the lugs 16 and 17, and other elements of the mechanism will be varied to arrange for a large number of different shapes and kinds of keys for locking and unlocking the mechanism. This variation in the key structure and in the locking mechanism to change the character of key necessary to unlock the various types of locks is well known to those skilled in the art. Thus a large number of variations may be obtained by

changing the shape or positions, or both, of the lugs 16 and 17, as well as the slots 20.

From the description hereinbefore given of the locking bolt, it will now be apparent that when the key illustrated in Fig. 8 is inserted into the slot 13, the locking bolt being positioned in the locked position, it will be carried into the locking mechanism until the prongs 28 at the end of the key 29 ride in the slots 20 of the key plate. When in this position, the notches 30 cut in the key will align with the segments 14 and 15, and consequently when the key is turned, so to throw the locking bar 22 to the unlocked position, these notches will ride in these segments and the key cannot be removed.

It will thus be evident that the key is permanently held in the locking bolt whenever the mechanism is in the unlocked position by the interaction between the slots 30 of the key and the segments 14 and 15 of the locking mechanism. The movement of the key from the unlocked to the locked position of the locking bolt and from the locked to the unlocked position is controlled by the projecting lugs 16 and 17, which strike against the edge 31 of the key to prevent movement thereof when the key is turned to either the locked or unlocked position.

As clearly illustrated in Fig. 5 the locking bar 22 loosely secured to the key plate 19 by the pivot 21 is eccentrically located on such key plate, and consequently when the key plate 19 is turned through the medium of the key, due to the eccentric interconnection between the key plate and the bar 22, the locking bar 22 will be projected from the exterior surface of the housing 10, as shown in dotted lines in Fig. 3.

The position to which the key plate and the locking bar is moved by the key 29 is maintained by frictional contact between the key plate 19 and housing 10, said frictional contact being increased through the compression spring 24, as hereinbefore described.

Referring now to Figs. 1 and 2, it will be noted that the locking bolt illustrated in detail in Figs. 3 to 5 inclusive can be readily fitted and installed on the cap carrying the motor meter, so as to securely lock the motor meter and cap to the filling nipple of the radiator hood. The installation of the locking bolt is an exceedingly simple operation consisting merely in drilling a hole through the filling nipple 32 and the flange 33 of the radiator cap when the radiator cap has been screwed home on the nipple 32. The hole drilled through the nipple 32 and the flange of the cap 33 is of a diameter substantially equal to the diameter of the body of the housing 10 of the locking bolt, and the flange of the cap 33 is preferably countersunk slightly by a larger drill having a diameter substantially equal to the flange 11 of the locking bolt. The countersunk portion in the cap adapted to receive the flange 11 of the locking bolt serves as a convenient means for adusting the locking bolt to caps and nipples of varying thicknesses. Thus, by regulating the depth of the countersunk portion in the cap, the thickness through the cap and flange can be adjusted to equal the linear separation between the inner shoulder of the flange 11 and the locking face of the locking bar 22. When the thickness of the flange of the cap and the nipple 32 is equal to the linear distance between the outer face of the key admitting plate 12 and the locking face of the locking bar 22, the cap is countersunk a distance exactly equal to the flange 11, and the key admitting plate will then be flush with the exterior surface of the cap flange. For any variations in the thickness of the flange of the cap and nipple, in which their combined thickness is either less than or greater than the linear distance between the face of the key admitting plate 12 and the locking face of the locking bar 22, the face of the key admitting plate will either project beyond the face of the cap or be countersunk so as to be positioned below the face of the cap accordingly as this distance is less or greater respectively. When these aligned holes or apertures have been drilled in the filling nipple 32 and the flange of the cap 33, it will be evident that the locking bolt can be readily inserted through the aligned apertures, after which the key will be turned to the locked position and the locking bar 22 will assume the position shown in Fig. 2, thereby permanently locking the bolt in its position in the aligned apertures and also locking the radiator cap 34 and its associated motor meter 35 to the nipple 32 of the radiator.

In Fig. 1 is shown the front view of a motor meter and associated cap secured to the radiator with the locking bolt in position, and illustrates the fact that the application of the locking bolt to the cap for locking it to the radiator in no way disfigures the cap. The presence of the locking bolt in the cap can hardly be observed owing to its exceedingly small size. However, notwithstanding the smallness of the lock it amply serves its purpose of preventing the stealing of the motor meter and associated cap, since thefts of this kind are invariably made by sneak thieves who rob this equipment merely because of the ease with which it can be removed. The lock positively secures the cap to the radiator and the cap can only be removed by unlocking the locking bolt and removing it from its position in the aligned apertures or by violently destroying the lock or the cap.

Fig. 7 is an illustration of the manner in which the lock is applied to a cap 36 secured

to a tank 37, such as is ordinarily used to carry the gas used for the propulsion of automobiles.

From the foregoing description it will be evident that a locking bolt made in accordance with the teachings of this invention comprises a very simple structure which can be commercially manufactured at a comparatively low cost, and which can be very easily installed without defacement of the apparatus in which it is installed, and which, when installed, makes a sightly and neat appearance. The locking mechanism is consequently very attractive to the individual who wishes to protect his motor meter and cap and who desires to do this at small expense and wishes to make the installation himself.

In Fig. 6 a modified form of the invention is shown incorporating another method for adjusting the linear distance between the inner face of the flange 11 and the locking face of the locking bar 22. In this modified form the locking bar 22 is secured to a rod 38 which is riveted at one end 39 to the key plate 22 and loosely fitted at the other end 40 in a curved groove 45 in the end plate 25. The curved groove 45 is designed to permit the necessary movement of the rod 38 to which said rod is subjected in the locking and unlocking movements of the mechanism. The rod 25 carries a plurality of circular grooves such as 41 in which the key plate 22 is loosely secured by any suitable means, preferably by a set screw such as 42. The grooves 41 are provided so that the position of the locking bar 22 may be adjusted along said bar 38 to provide for varying thicknesses of cap flanges and filling nipples.

In the modification shown in Fig. 6 the housing 10 is fitted with an aperture at 43 to provide an opening through which the set screw may be reached for the purpose of adjusting the position of the locking bar 22.

Obviously, the invention is not limited to the specific embodiments thereof herein illustrated and described, but is capable of many variations and other applications within the spirit and scope of the invention as set out in the following claims.

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

1. In a device of the class described, in combination, an enclosure, a filling aperture for said enclosure fitted with a nipple, a cap fitted with a flange adapted to be positioned on said nipple, means for interlocking said cap to said nipple, a vapor and liquid confining means carried by said interlocking means whereby the gases and vapors in the enclosure cannot escape through said interlocking means, and means carried by said interlocking means for locking said interlocking means in position all of said means being constructed as a unitary device.

2. In a device of the class described, in combination, an enclosure, a filling aperture for said enclosure fitted with a nipple, a cap fitted with a flange adapted to be positioned on said nipple, means for interlocking said cap to said nipple, a key for locking said interlocking means in position, and means in said interlocking means cooperating with said key to retain the key in position in the interlocking means when in unlocked position and which permanently holds said key and interlocking means in this relationship until the key is turned to the locked position.

3. In a device of the character described, in combination, an enclosure, a filling aperture for said enclosure fitted with a nipple, a cap fitted with a flange adapted to be positioned on said nipple, aligned apertures in said flange and nipple, and a locking bolt comprising a physical entity adapted to be inserted in said aligned apertures, a key cooperating with said bolt, and means carried by said bolt to retain the key in the bolt when said bolt is in the unlocked position and permanently hold the key in said position, until said key is turned to the locked position.

4. In a device of the character described, in combination, an enclosure, a filling aperture for said enclosure fitted with a nipple, a cap fitted with a flange adapted to be positioned on said nipple, aligned apertures in said flange and nipple, a locking bolt comprising a physical entity adapted to be inserted in said aligned apertures, said bolt carrying means to lock it in position in said aperture and thereby lock said cap to said nipple, a key cooperating with said means, and means carried by said bolt to retain the key in the bolt when said bolt is in the unlocked position and permanently hold the key in said position until said key is turned in the locked position.

5. In a device of the character described, in combination, an enclosure, a filling aperture for said enclosure fitted with a nipple, a cap fitted with a flange adapted to be positioned on said nipple, aligned apertures in said flange and nipple, a locking bolt comprising a physical entity adapted to be inserted in said aligned apertures, said bolt carrying means to lock it in position in said aperture and thereby lock said cap to said nipple, and means for adjusting said locking means for nipples and caps of varying thicknesses.

6. In a device of the character described, in combination, an enclosure, a filling aperture for said enclosure carrying a nipple, a cap adapted to be secured to said nipple to cover said aperture, means adapted to interlock said cap and said nipple, and a locking means comprising a cooperating actuating member and locking member carried by

said last mentioned means to lock said means in the interlocking position, said locking means being positioned in said first mentioned means to substantially confine any gases contained in the enclosure.

7. In a device of the character described, in combination, an enclosure, a filling aperture for said enclosure carrying a nipple, a cap adapted to be secured to said nipple to cover said aperture, said cap and nipple being fitted with aligned apertures, a locking bolt adapted to be inserted through said aligned apertures to interlock said cap and said nipple, and a locking means comprising a cooperating actuating member and locking member carried by said bolt to lock it in position in said apertures, said locking bolt serving to close said aligned apertures and to substantially confine any enclosed gases and liquids.

8. In a device of the character described, in combination, an enclosure, a filling aperture for said enclosure carrying a nipple, a cap adapted to be secured to said nipple to cover said aperture, said cap and nipple being fitted with aligned apertures, a locking bolt including a locking bar adapted to be inserted through said aligned apertures to interlock said cap and said nipple, means permitting a movement of said locking bar for adjusting said locking bolt to caps and nipples of varying thicknesses, and a locking means carried by said bolt to lock it in position in said apertures.

9. In a device of the character described, in combination, an enclosure, a filling aperture for said enclosure carrying a nipple, a cap adapted to be secured to said nipple to cover said aperture, said cap and nipple being fitted with aligned apertures, a locking bolt adapted to be inserted through said aligned apertures to interlock said cap and said nipple, means for adjusting said locking bolt to caps and nipples of varying thicknesses, a locking means carried by said bolt to lock it in position in said apertures, a key adapted to operate said locking means, and means carried by said bolt for maintaining said key in said bolt when the bolt is in the unlocked position.

10. In a device of the character described, in combination, a radiator fitted with a filling nipple, a radiator cap, a motor meter carried by said cap, means to removably associate said cap with said nipple, a locking means comprising a physical entity adapted to interlock said nipple and cap, and a vapor and liquid confining means carried by said locking means whereby the gases and vapors confined in the radiator cannot escape to the atmosphere through said locking means.

11. In a device of the character described, in combination, a radiator fitted with a filling nipple, a radiator cap, a motor meter carried by said cap, means to removably associate said cap with said nipple, a locking bolt comprising a physical entity adapted to interlock said nipple and cap, locking means carried by said bolt for locking said bolt in position and a vapor and liquid confining means carried by said bolt whereby the gases and vapors in the radiator cannot escape through said bolt into the atmosphere.

12. In a device of the character described, in combination, a radiator fitted with a filling nipple, a radiator cap adapted to be screwed on said nipple, a motor meter carried by said cap, aligned apertures in said cap and nipple, means adapted to be inserted in said aligned apertures to interlock said cap and nipple, a key cooperating with said means, and means co-operating with said key, whereby the key is retained and held in said first mentioned means when said means is in the unlocked position, whereby said key will act as a suitable handle for the insertion and removal of said means in the aligned apertures.

13. In a device of the character described, in combination, a bolt adapted to lock two parts by inserting said bolt in aligned apertures of said parts, a locking means including a locking bar carried by said bolt to lock it in said aligned apertures, and means carried by said locking means to permit a movement of said locking bar to adapt said bolt to apertures of different thicknesses.

14. In a device of the character described, in combination, a bolt adapted to lock two parts by inserting said bolt in aligned apertures of said parts, a locking means carried by said bolt to lock it in said aligned apertures, a key for actuating said locking means, means carried by said bolt for maintaining said key in said bolt when the locking means is in the unlocked position, and means carried by said locking means to adapt said bolt to apertures of different thicknesses.

In witness whereof, I have hereunto subscribed my name.

OLIVER PRESTON SMITH.