Aug. 27, 1946. M. KATZ 2,406,464

LOCK DEVICE

Filed Aug. 24, 1945 3 Sheets-Sheet 1

Fig. 1.

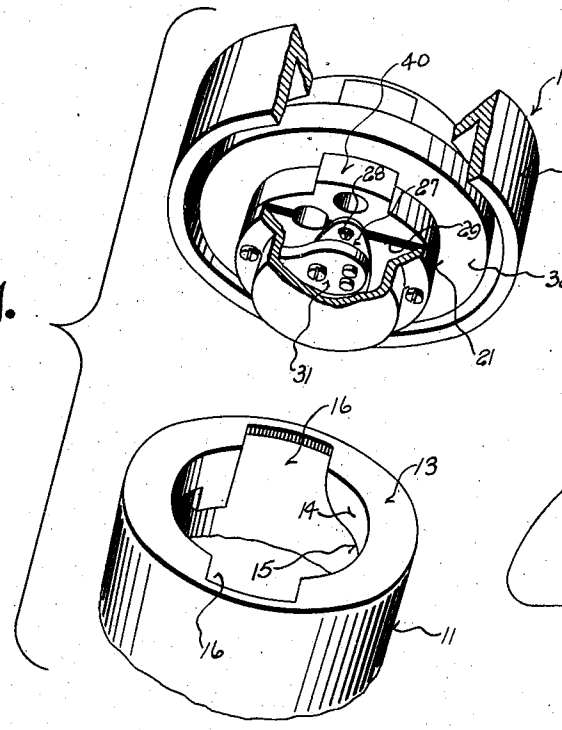


Fig. 1a.

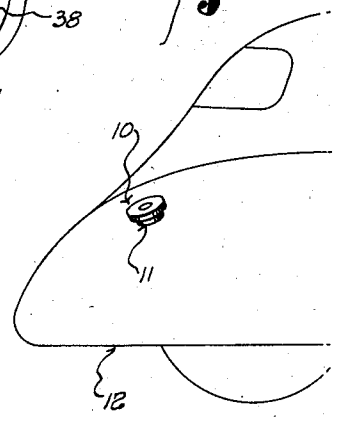
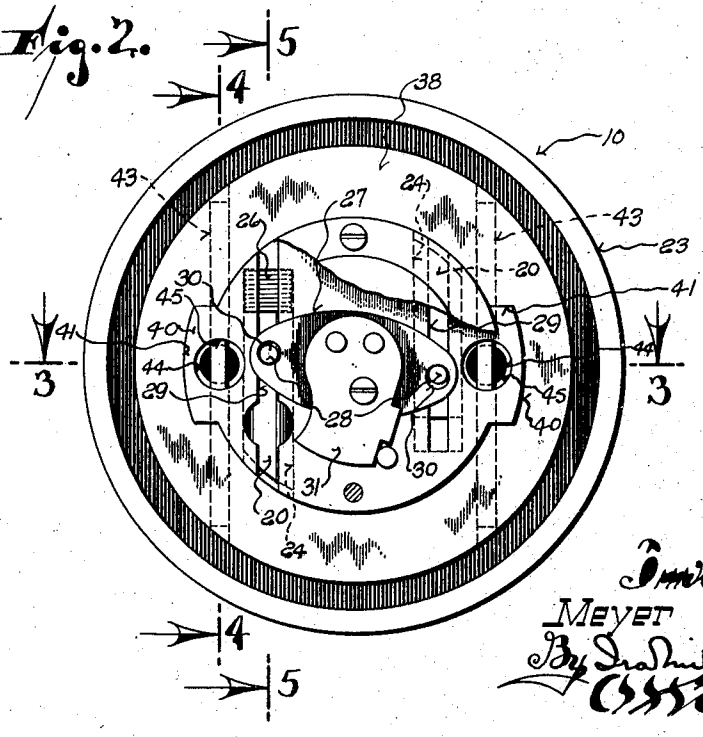


Fig. 2.



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Fig. 3.

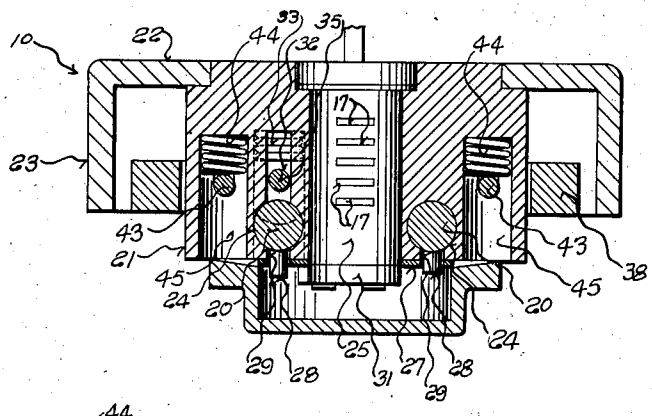


Fig. 4.

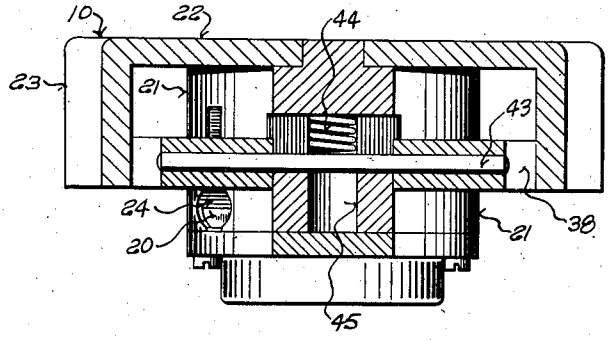


Fig. 5.

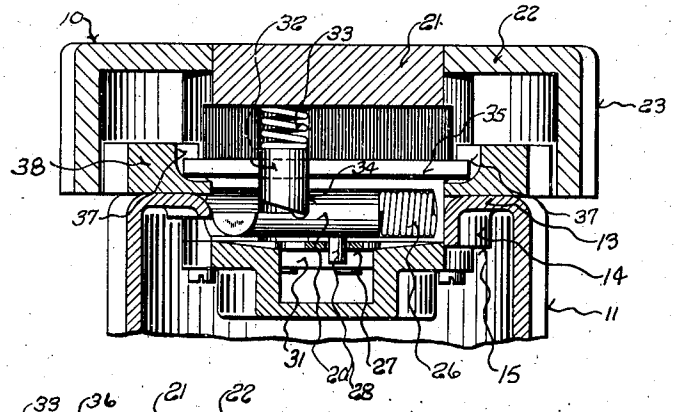
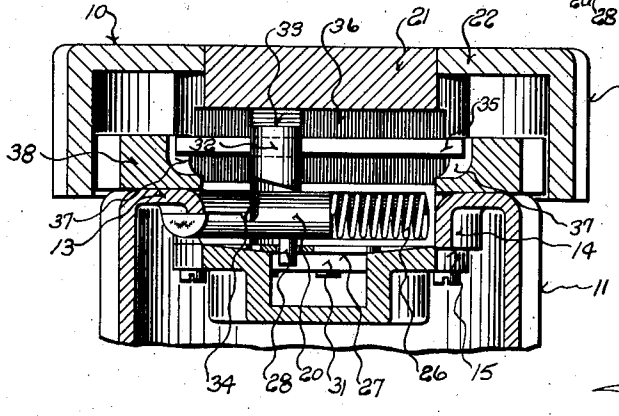


Fig. 6.



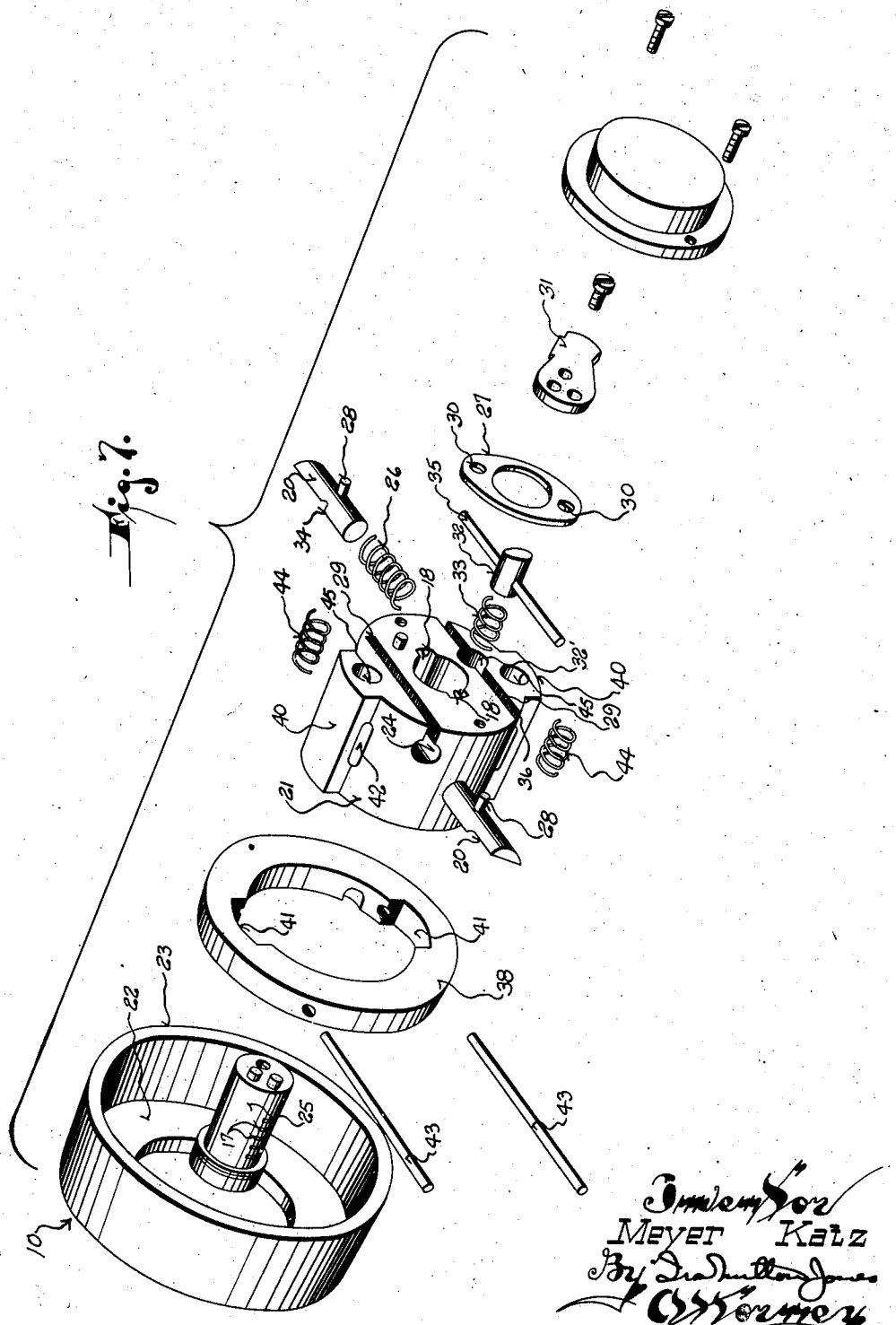
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Fig. 7.



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UNITED STATES PATENT OFFICE

2,406,464

LOCK DEVICE

Meyer Katz, Canoga Park, Calif.

Application August 24, 1945, Serial No. 612,359

6 Claims. (Cl. 70—169)

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This invention relates to lock devices and refers more particularly to locking covers or caps especially suited for application to the open end of fill spouts or the like to lock the fill spout closed. In their most common use caps of this nature are employed as covers for the fill spouts of gasoline tanks on automobiles and their ability to lock the spouts closed effectively prevents unauthorized access to such tanks.

Locking caps previously provided for this purpose have been found objectionable in most instances because of the fact that they require the use of a key after application to the fill spout to effect projection of the bolts thereof to operative position engaging under the customary ledge at the upper open end of the fill spout.

In all such types of locking caps requiring key rotation to effect projection of the bolts to their locking positions the locking bolts are subjected to substantial strain by being forced under the fill spout ledges which is particularly objectionable inasmuch as it leads to breakage of the bolts or at least rapid wearing thereof.

It is one of the objects of this invention, therefore, to provide a locking cap of the character described which may be applied to the fill spout of a gasoline tank or other receptacle in an unlocked condition and to provide for projection of the bolts to their operative locking positions by trigger means actuated by the fill spout as the cap is pressed thereon. This secures the advantage of projecting the bolts to their operative locking positions without placing any strain on the bolts and without actuation of the key for the cap.

Another object of this invention resides in the provision of a locking cap having bolt means biased to operative projected position and in which bolt retaining and releasing means is provided to hold the bolts in retracted position for application to the fill spout with release of the bolts effected by engagement of the bolt releasing means with the fill spout during application of the cap thereto.

A further object of this invention resides in the provision of a locking cap of the character described wherein release of the bolts to their operative projected positions is effected by means entirely independent of the bolt retracting mechanism.

With the above and other objects in view, which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described, and more particularly defined by the appended claims, it being understood

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that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawings illustrate one complete example of the physical embodiment of the invention constructed in accordance with the best mode so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a perspective view of the locking cap of this invention showing the manner of its application to the upper open end of a fill spout;

Figure 1*a* is a fragmentary elevational view of a portion of an automobile illustrating the locking cap of this invention applied to the fill spout with which the gasoline tank of the automobile is provided;

Figure 2 is a bottom view looking into the open end of the locking cap of this invention;

Figure 3 is a cross sectional view of the cap taken through Figure 2 on the plane of the line 3—3;

Figure 4 is a cross sectional view of the cap taken through Figure 2 on the plane of the line 4—4;

Figure 5 is another cross sectional view taken through Figure 2 on the plane of the line 5—5 but showing the cap being applied to a fill spout while in an unlocked condition;

Figure 6 is a cross sectional view similar to Figure 5 but illustrating the cap locked in place on the fill spout; and

Figure 7 is a perspective view of the cap with its component parts separated to better illustrate the same but maintained in their proper order of assembly.

Referring now more particularly to the accompanying drawings in which like numerals indicate like parts, the numeral 10 generally designates the locking cap of this invention which as shown in Figures 1 and 1*a* is adapted to be applied to the upper open end of a fill spout 11 such as the gasoline tank of an automobile 12 is customarily provided with.

The fill spout 11 is of conventional design and has the customary inturned annular flange or rim 13 at its upper open end portion to define the seat against which the usual cap engages to close and seal the spout. The inner edge portions of the flange or rim 13 are struck inwardly into the fill spout so as to provide a substantially cylindrical wall 14 concentric to the wall of the spout with the marginal edge portions 15 thereof defining diametrically opposite ledges having a cam surface. Recesses 16 provide entrances at diametrically opposite sides of the rim through which

the customary rigid locking ears of the conventional cap are inserted for engagement under the cam-like ledges 15.

The lock bolts 20 of the cap of this invention also engage under the ledges 15 to likewise hold the cap locked in place on the spout, but as will appear in greater detail hereinafter, such engagement of the bolts under the ledges is brought about automatically by application of the cap to the spout with the cap in an unlocked (bolt retracted) condition, without requiring key actuation.

The locking bolts 20 are carried by the lower or inner end portion of a lock body 21 having its upper end secured to the bottom 22 of a substantially cup-shaped cap 23 with the lower or inner end of the lock body projecting from the open end of the cap. The lock bolts are slidably received in wells 24 in the lock body for motion crosswise of the open end of the cap on substantially parallel axes and at opposite sides of a lock cylinder 25 centrally rotatably journalled in the lock body.

The lock cylinder is exposed to the top of the cap to enable insertion of a proper key thereinto for retraction of the lock tumblers 17 from tumbler grooves 18 in the lock body so as to free the cylinder for rotation.

A spring 26 in the bottom of one of the wells reacts against the inner end of the bolt therein to yieldingly bias the bolt outwardly of the body to a projected position for engagement under one of the ledges 15 of the fill spout. A link connector 27 rotatably received on the lower end portion of the lock cylinder which projects from the lock body is connected between the lock bolts, however, to assure motion thereof in unison but in opposite directions in response to the action of the spring.

The connection between the bolts and the link is provided by pins 28 projecting from the undersides of the bolts and operating in slots 29 through which the wells 24 open to the bottom of the lock body with the pins received in apertures 30 at the opposite ends of the link. The apertures 30 are oversize to compensate for arcuate movement of the link and reciprocating motion of the pins in the slots 29.

A lever 31 secured to the inner end of the lock cylinder 25 and overlying the adjacent end of the lock body and the link 27 engages one of the pins 28 during rotation of the lock cylinder in an unlocking direction to retract the bolts into their wells to inoperative positions in which they are releasably maintained by a plunger-like latch 32.

This latch is slidable in a bore 32', the axis of which is substantially parallel to the lock cylinder axis and intersects the axis of one of the lock bolt wells so that the lock bolt therein confines the latch in its bore. A spring 33 in the bottom of the bore 32' and acting against the plunger yieldingly urges the same against the side of the bolt adjacent thereto and snaps the plunger behind a shoulder 34 on the bolt when the bolts have been retracted by the lock cylinder.

The plunger 32 has a rod 35 attached thereto and projecting transversely therefrom to project from opposite sides of the lock body. The rod 35 is slidably received in a slot 36 forming substantialy an upward extension in the lock body of the slot 29 in line with the plunger, and the opposite ends of the rod overlie shoulders 37 formed on the inner peripheral portions of a washer 38 slidably mounted on the exterior of the lock body

inside the cap near the lower open end of the cap.

The washer is guided for longitudinal motion on the lock body by means of diametrically opposite ribs 40 projecting from the exterior of the lock body and engaging in suitable recesses 41 in the inner periphery of the washer. The ribs 40 are located at opposite sides of the bolts and have slots 42 cut therethrough medially of the ends of the lock body as shown in Figure 7 to slidably receive rods 43 carried by the washer and extending across its aperture.

Engagement of the rods 43 with the bottoms of the slots 42 limits longitudinal motion of the washer outwardly of the cap to which position it is biased by compression springs 44 contained in wells 45 in the lock body with the springs confined between the bottoms of the wells and the rods 43.

Motion of the washer upwardly into the interior of the cap thus is translated into motion of the plunger 32 in a direction to unlatch or disengage the same from its cooperating lock bolt and frees the bolts for spring propelled motion to their operative projected positions.

Such motion is imparted to the washer 38 by flatwise engagement thereof with the rim 13 at the top of the fill spout during application of the cap to the spout with the ribs 40 of the lock body engaging in the entrance openings 16 of the spout to guide the cap in place.

Thus, upon depression of the cap onto the spout, the spring washer 38 is forced into the interior of the cap to effect release of the locking bolts of the device at a level well beneath the level of the ledges 15 to thereby nonrotatably secure the cap on the spout against removal except by actuation of the lock cylinder with a proper key.

As clearly shown in Figures 5 and 6, the shoulder 34 on the lock bolt has substantial height so as to enable a substantial length of the latch-like plunger 32 to be engaged therewith in the unlocked position of the bolts. This requires the cap to be pressed downwardly onto the fill spout a distance sufficiently far as to carry the locking bolts beneath the ledges 15 regardless of variations in the distances of such ledges on different spouts from the rim of the spout. It will, therefore, be seen that the cap has self-adjusting features with respect to its locking action.

Also, it will be seen that the bolts are projected to their operative locking positions entirely without subjection of the bolts to strains such as was encountered in previous gasoline caps wherein the bolts were propelled to operative position by actuation of a proper key, and that the bolts are further protected against damage by the nonrotatable connection between the cap and spout afforded by engagement of the lock body ribs 40 in the spout recesses 16.

After application of the cap to the spout in the manner described, it will be noted that although the spring plunger 32 remains in an elevated position riding on the cylindrical surface of the bolt, the springs 44 reacting against the rods 43 snap the spring washer 38 against the rim 13 of the spout so that the washer cooperates with the bolts to clamp the flange therebetween under spring pressure with the washer acting as a seal to prevent sloshing of liquids through the open end of the spout.

The compression springs 44 also serve to raise the cap a slight distance above the locked position thereof on the fill spout when the bolts are retracted to unlock the cap, thus providing a "pop

up" feature desirable for its indication that the cap is unlocked.

The "pop up" feature together with the fact that locking is accomplished merely by the act of pressing the cap onto the fill spout to cause motion of the spring washer in the manner of a trigger in effecting release of the lock bolts renders the locking cap of this invention substantially automatic in operation.

From the foregoing description taken in connection with the accompanying drawings, it will be readily apparent to those skilled in the art that the locking cap of this invention embodies the features of automatic locking and lifting from the fill spout upon unlocking, together with the advantage of locking without imposing any strain on the lock bolts during the locking operation.

What I claim as my invention is:

1. A locking cap of the character described comprising: a lock body; a pair of lock bolts mounted on the lock body for movement transversely thereof in opposite directions; spring means biasing the lock bolts to operative positions projecting outwardly of the lock body; latch means for releasably holding the lock bolts in retracted positions; trigger means guided on the exterior of the lock body for motion longitudinally thereof and engageable with the end portion of a fill spout to which the cap is applied; and a connection between said trigger means and the latch means whereby motion of the trigger means along the lock body produced by pressing the cap on the end portion of the fill spout effects disengagement of the latch means from the lock bolts so as to free the bolts for spring propelled motion to their operative positions.

2. In a locking cap of the character described: a substantially cup-shaped cover adapted to be applied to a fill spout with its open end facing the open end of the fill spout; a lock body mounted inside the cover coaxially thereof and projecting from the open end of the cover; a washer encircling the lock body inside the cover and flatwise engageable with the open end of the fill spout when the cover is applied thereto; a connection between the lock body and the washer affording the washer a limited degree of longitudinal motion along the exterior of the lock body; spring means reacting between the lock body and the washer to yieldingly maintain the washer projected away from the bottom of the cover; bolt means carried by the projecting end portion of the lock body for motion transversely of the axis of the lock body from retracted to operative positions underlying said washer so as to cooperate with the washer in clamping a portion of the fill spout therebetween; and latch means controlled by the washer for holding said bolt means in retracted position, movement of the washer a predetermined distance into the cover produced by pressing the cover onto the spout effecting release of the latch means to thereby free the bolt means for motion to operative position.

3. A lock device of the character described comprising a substantially cup-shaped cover the open end of which is of a size to enable telescoping thereof over the upper open end of a fill spout; a lock body secured in the bottom of the cover and projecting from the open end thereof coaxially with the cover; a pair of spring propelled clock bolts carried by the lock body for sliding motion on axes substantially normal to the lock body axis

to and from operative projected positions in which the outer end portions of the bolts are engageable under a ledge inside a fill spout to which the cover is applied to lock the cap thereto; means on the lock body connecting said bolts to cause sliding motion thereof in unison but in opposite directions; a latch carried by the lock body for sliding motion on an axis substantilly parallel to the axis of the lock body and biased to a position engaging behind a shoulder on one of the bolts in the retracted position of the bolts so as to maintain the same inoperative; a washer slidable along the exterior of the lock body inside the cover and connected with the latch to impart movement thereto in a direction to disengage the latch from said lock bolt and thereby free the lock bolts for spring propelled motion to their operative locking positions upon motion of the washer into the cup-shaped cover, said washer engaging the extremity of the fill spout to be moved thereby upon pressing of the cover down onto the open end of the fill spout; and means yieldingly biasing the washer towards the lock bolts whereby the washer and lock bolts are tightly drawn against opposite sides of said ledge on the fill spout in the locked position of the cover.

4. A locking cover for a fill spout having a rim at its upper open end and an inturned flange defining a ledge at the interior of the spout adjacent to said rim thereof, characterized by: a substantially annular member flatwise engageable with said rim and mounted in the cover for motion relative thereto toward and from the bottom of the cover with the sealing member spring urged in a direction outwardly of the cover; bolt means projectible from a retracted cover unlocked position to an operative locking position under spring force, said bolt means cooperating with the sealing means in the locked condition of the cover to yieldably clamp said rim of the spout therebetween; latch means for restraining the bolt means against projection to operative position; and a connection between said latch means and said annular member whereby motion of the annular member in a direction into the cover produced by pressing the cover onto the fill spout disengages the latch means and thereby releases the bolt means for spring propelled projection to operative position.

5. A lock device of the character described comprising: a lock body of a size such that its lower end fits within the open end of a fill spout having a rim providing a ledge adjacent to the open end of the spout; a lock bolt carried by the body for motion transversely thereof across the interior of the spout and biased to an operative position projected from the lock body; a washer guided for longitudinal motion along the exterior of the lock body toward and from the lock bolt; spring means biasing the washer toward the lock bolt and against a stop on the body so that the washer normally lies adjacent to the bolt, the washer being engageable with said rim at the upper end of the fill spout and moved away from the bolt as the lock body is inserted into the spout to carry the lock bolt thereon beneath said ledge on the fill spout; a latch behind which the bolt engages in its retracted position to maintain the bolt inoperative; and a connection between the latch and the washer by which motion of the washer along the lock body away from the lock bolt during application of the device to the fill spout moves the latch toward disengagement from the lock bolt with final disengagement of the

latch from the bolt being effected after separation of the washer from the bolt a predetermined distance to assure spring propulsion of the bolt to an operative locking position beneath the ledge on the fill spout, whereby the lock bolt is propelled to its operative locking position beneath the ledge without imposition of strain on the bolt.

6. A lock device of the character described comprising: a lock body the inner portion of which is insertable into the upper open end of a fill spout having a keeper-like ledge on its interior; a lock cylinder rotatably journalled in the body and projecting from the inner end thereof; a pair of lock bolts carried by the inner portion of the lock body at opposite sides of the cylinder axis for sliding motion on parallel axes substantially normal to the lock cylinder axis; a connector rotatably journalled on the projecting end of the lock cylinder and connected with said lock bolts to cause the same to slide in unison but in opposite directions from inoperative retracted positions to operative locking positions projecting from opposite sides of the lock body; spring means acting on said lock bolts for yieldingly urging the same to operative projected positions;

a latch movably carried by the lock body and biased to a position engaging a shoulder on one of said lock bolts in the unlocked condition of the device to hold the lock bolts retracted; a motion transmitting connection between the lock cylinder and the lock bolts whereby rotation of the lock cylinder in one direction effects sliding motion of the bolts to their retracted positions at which the latch is operative; a washer guided for longitudinal motion along the exterior of the lock body above the lock bolts and biased toward the lock bolts, said washer being engageable flatwise with the upper end portion of the fill spout upon insertion of the lock body into the spout to be moved thereby upwardly away from the bolts as the device is pressed onto the spout; and a motion transmitting connection between the washer and the latch operable to effect release of the latch and consequently spring propulsion of the bolts to their operative projected positions upon motion of the washer away from the bolts a distance at least equal to the axial spacing between the washer engaged surface of the spout and the underside of the ledge thereof.

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