

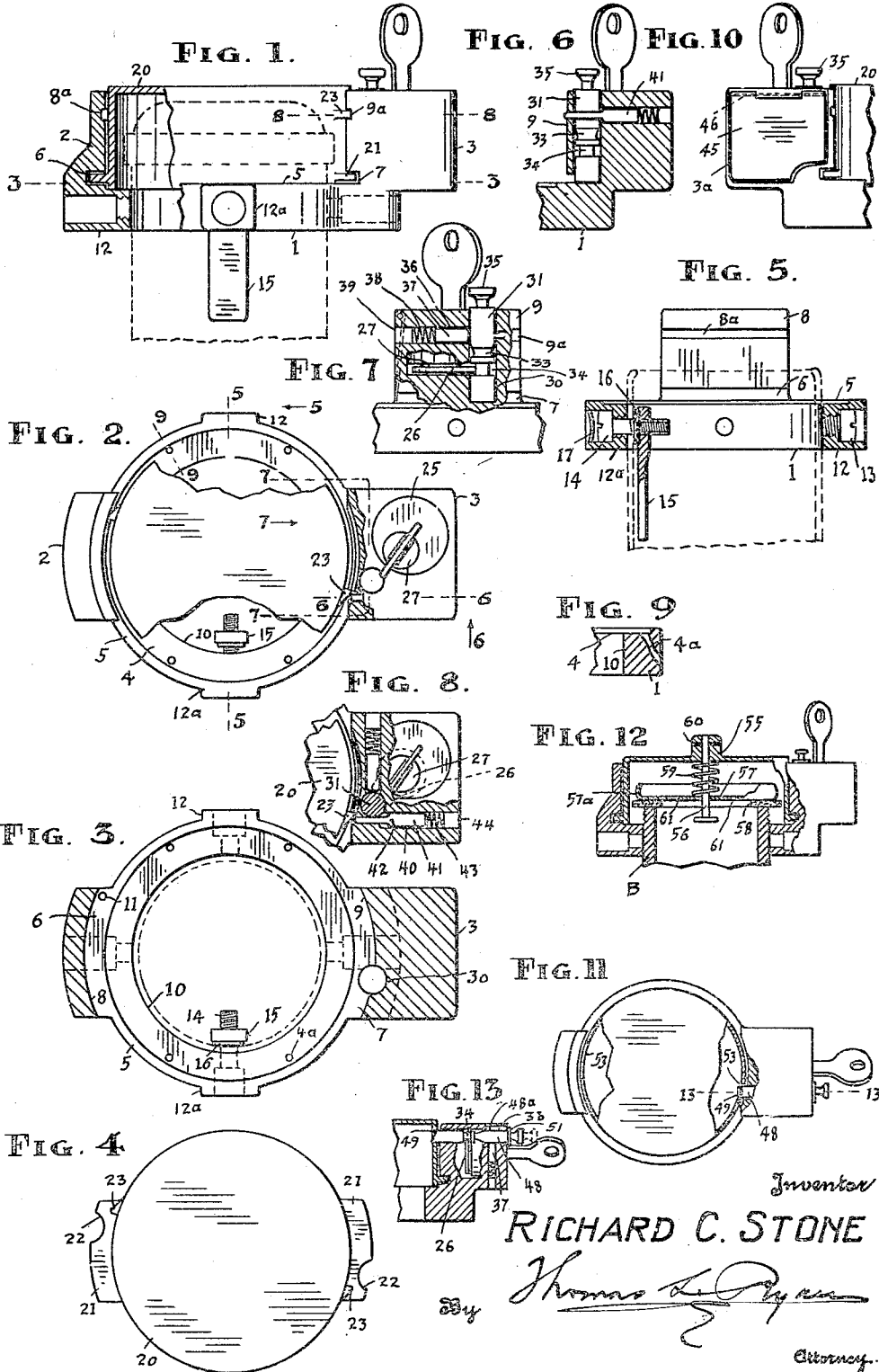
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TANK CLOSURE DEVICE

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TANK CLOSURE DEVICE

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This invention relates to improvements in closure means for the inlet nozzles or spouts of liquid containing receptacles, such as motor vehicle tanks and the like, the purpose of such a device being to prevent surreptitious access to the contents of the tank.

Advantages desired in an invention of the above description are that it should be economical of manufacture and easy to install and use. Also it should be durable and not liable to get out of order or repair.

The above named general advantages, and also certain more specific benefits which will presently appear, are afforded by the new construction, combination and arrangement of parts described in the following specification, and illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a side view of my improved closure device, a portion thereof being shown in cross section, and the cap and top portion of the tank nozzle being indicated by dotted lines.

Figure 2 is a top plan view of Figure 1, portions of the cover element being broken away.

Figure 3 is a horizontal sectional top plan view taken on the line 3—3 in Figure 1, the cover having been removed. The dotted lines indicate the position of the tank nozzle.

Figure 4 is a top plan view of the cover removed.

Figure 5 is a vertical cross sectional view taken on the line 5—5, in the direction of arrow 5 in Figure 2.

Figure 6 is a vertical cross sectional view taken on the line 6—6 in the direction of arrow 6 in Figure 2.

Figure 7 is a vertical cross sectional view taken on the line 7—7 in the direction of arrow 7 in Figure 2.

Figure 8 is a sectional top plan view taken on the line 8—8 in Figure 1.

Figure 9 is a cross sectional view taken on the line 9—9 in Figure 2.

Figure 10 is a rear view of the housing 3 showing the lock shelter plate in folded down position.

Figure 11 is a top plan view of the invention in modified form.

Figure 12 is a side view of the invention in modified form for application thereof to a tank nozzle in which the regular closure cap thereof has been dispensed with.

Figure 13 is a vertical cross sectional view taken on the line 13—13 in the direction of arrow 13 in Figure 11.

Broadly stated, my invention consists of a frame adapted to be secured to the tank nozzle, a cover removably retained in united relation with said frame, a key-operated lock embodied in the frame, a bolt operable by said lock, a latch for the cover, and a spring pressed detent to yieldably retain the latch against movement when the latter is in the unlatched position, the said latch being adapted to be engaged and held by the bolt when in the latched position. The invention also includes a spring pressed catch which is operable when the latch is in unlatched position, to hold the latch in said unlatched position, and a device on said cover which acts when the latter is united with the frame, to move the said catch to position disengaged from the latch, and to hold it in said disengaged position.

In the embodiment of my invention, as it is illustrated in the drawings, the frame 1 which may be of cast metal, and is ring-shaped in plan, has opposed integrally formed upright housings 2 and 3. The machined top surface of the said frame, and the machined grooves in the lower portions of the faces of the said housings 2 and 3, constitute an annular seat 4, a rim 5, and opposed recesses 6 and 7. The opposed faces 8 and 9 of the said housings are of curvature coincident with the curvature of the seat 4. The bore 10 of the frame is of suitable diameter as shown. A stop lug 11 is provided at the end of the recess 6, as shown in Figure 3. In each of the spaced boss portions 12, and which may be four in number, is a countersunk threaded aperture in which a cap screw 13 may be screwed. At one of the said four boss portions 12, namely the one designated 12a, I provide a cap screw 14 which is of diameter to be passed freely through the said threaded aperture. This cap screw 14 is of length shown in Figure 5, and upon same

is retained a grip bar 15. A felt washer 16 is embodied in the head portion of the said grip bar. The functions of the several parts just described will presently be referred to.

The invention as supplied to the customer, appears as shown in Figure 1. Preliminary to installing same, the cap of the tank nozzle is removed. Screw 14 is then unscrewed from the grip bar 15. The frame will have been lowered to the desired position in relation to the nozzle, and while being there stayed by the hand, screw 13 is screwed into engagement with the wall of the nozzle, the frame being thereby held in attached connection with the said nozzle. By the use of a suitable hand tool with its drill disposed in the aperture of the boss portion 12a, a hole of suitable diameter is provided in the wall of the nozzle. The grip bar 15 is then disposed and held in position with its threaded bore in registration with the hole in the wall of the nozzle. The screw 14, inserted in position, will have passed through the hole in the wall of the nozzle, and have entered the threaded hole therefor in the grip bar 15. Upon tightening the said screw, (its head being seated in the counterbore) the grip bar is drawn to binding engagement with the nozzle wall, the frame 1 being thereby fastened securely in its position thereon. The grip bar being of extended formation, it cannot become unscrewed, and the felt washer serves to seal the space between the grip bar and the bore through which the screw 14 is passed. At each of the openings, a plug which may consist of a convexed sheet metal disk 17, constitutes a seal against access to the screw.

The cover 20, of the suitable height shown, and which may be of sheet or cast metal, preferably the latter, and which has a machined bottom face to rest on seat 4 of the frame, is provided with opposed similar integrally formed flanges 21 and 21, each of which has a notch 22. At a predetermined height on the opposed sides of the said cover and located in the positions shown in Figure 4 are similar cams 23. Of these two cams, the one only which comes to position adjacent to the housing facing 9, functions. By providing the two, in the opposed arrangement as shown, no especial attention is necessary in the placing of the cover in position. To unite the cover with the frame, it is disposed upon the seat 4, where it is retained by the rim 5. It is then turned in the natural manner, clockwise, (to the right), the cams 23 passing the clearance ways 8a and 9a, and the flanges 21 and 21 passing into the recesses 6 and 7 of the said housings. The distance through which the cover is turned is limited by one of the said flanges meeting the stop lug 11. The cover in this position is retained against transverse or vertical dislodgment, and its edges

and the flanges are shielded from the elements, and they are practically inaccessible to tools.

Embodied in, and suitably secured in sunken position, in metal to metal union with the housing 3, is a lock mechanism of the Yale type. The general structure, and the nature and functions of the working parts of the cylindrical body 25 of a lock of this kind are so well known as to need no specific description here. A bolt 26 as adapted for the present invention, and which is secured to and is operated by the barrel 27 of said lock mechanism, is of the formation shown in Figure 7, and by the dotted lines in Figure 8. Its function will presently be referred to.

In a vertical bore 30 which is in position to register with the notch of the flange 21 of the cover, when the latter is in the installed position as shown in Figure 2, a round bar designated as a latch 31 and which is provided with circumferential grooves 33 and 34, is slidably retained. The outer end of this latch is provided with a small integral stud or head 35, whereby the latch may be manually moved to or from the position shown in Figure 7, namely, the latching position. In the present instance the said movements are downwardly, or upwardly, respectively.

In a transverse bore 36 which extends into the bore 30, is a detent 37 which, by a spring 38 that is retained by the threaded plug 39, is pressed against the side of the latch. The function of this detent is to yieldably retain the latch against movement when the latter is in the unlatched, or raised position, engaging same for that purpose at the groove 33. The position of this latch with relation to the position assumed by the notch 22 of the flange of the cover is shown in Figure 2. The position of the lock bolt 26 with relation to the said latch, is shown in Figure 7, and by the dotted lines in Figure 8. In a transverse bore 40, which cuts slightly into the side of the aforesaid latch bore 30 and extends through the face 9 of the housing 3, is slidably retained a catch bar designated as a catch 41. The forward end of this catch 41 is of reduced diameter so as to pass the latch 31.

The function of a shoulder 42 which is a predetermined distance from the end of said catch, is to engage the groove 33 of the latch 31 when the latter is at the raised or unlatched position. By a spring 43, which is retained in said bore 40 by a screw plug 44, the said catch 41 is urged to position beyond the face 9 of the housing. With the latch 31 in the lowered or latching position, as shown in the drawings, the catch 41 is in the retracted position, (as shown in Figure 2).

By having the notch 22, and the cam 23 on opposed sides of the cover, and by the latter

being thereby reversible, no particular attention is involved in placing the cover in position other than to dispose it on the seat 4 and turn it in clockwise direction as hereinbefore described. With the cover in position

5 as shown in Figure 2, the cam 23 will have moved the catch 41 to the retracted position, and in which position it is held by said cam.

The invention installed and in locked position appears as shown in Figure 1, the frame enclosing the top portion and cap of the nozzle. The latch 31 is in the lowered or latched position, and it is there held by the bolt 26 whose end occupies the peripheral recess 34 of the latch. The cover is retained by the flanges 21 in united relation with the frame and it is held there against movement by the latch 31 which engages the notch 22. The cam 23 holds the catch 41 at retracted position, as above

20 stated.

To practice the invention, the key is inserted and turned anti-clockwise, the bolt 26 being thereby disengaged from the latch. The latch is then lifted, the distance of its upward movement being limited by the detent 37 which clicks into the groove 33. In this lifting of the latch, the notch of the flange 21 is cleared. The cover is then turned anti-clockwise and as the flanges pass free from the recesses 6 and 7, it is removed. The cap of the nozzle is now accessible.

In the removal of the cover as above described, the catch 41, by the action of spring 43, is shot forwardly, its shoulder 42 making engagement with groove 33 of the latch, thereby checking the latter against being inadvertently depressed before the cover will have been replaced. At this stage the key is not removable from the lock.

40 When ready to replace the cover, it is disposed in position on the annular seat 4 and is turned clockwise, the distance of its movement being limited by the stop lug 11, and the flanges in their passing into the recesses 6 and 7 come to rest with the notch 22 in registration with the latch bore 30. At this stage the catch 41 which will have been moved to retracted position as aforesaid by the cam 23, is held in that position, rendering the latch again free to be moved. (At this stage an inadvertent turning of the lock barrel to locked position would be prevented by the bolt making contact with the latch). The latch is then operated, the user simply depressing same, whence it engages the notch of the flange, thereby staying the cover. Then with a turn of the key clockwise the bolt 26 is moved to position to engage the groove 34 of the latch, the latter then being held against movement. The key may then be removed.

When the cover is in unlocked position, the chance of inadvertent failure to lock the same is minimized because the key is non-removable until the latch has been depressed.

Similarly, the chance of omitting the replacement of the cover is eliminated, because the key is non-removable when the cover is removed.

The invention constitutes a protective shield for the nozzle and its cap, and prevents surreptitious access thereto. It constitutes a closure device which is practically proof against efforts to remove same, except by the complete destruction thereof and of the tank nozzle. Even though the lock mechanism might be mutilated, the cover will still remain stayed in secure position, and will resist effort to loosen or dislodge same. The invention is economical of construction, easy to install, and is strong, durable and dependable.

By having a plurality of spaced bores in the frame available for the securing screws 13, the device lends itself readily to being conveniently installed with regard to such fixed parts of the vehicle structure as may be adjacent to the nozzle. At such times as it may be desired to shield the lock against the elements, a light sheet metal cover plate 45 which is hinged at 46, and which normally occupies a recess 3a therefor in the housing 3, is swung to the top of the housing and to position covering the said lock.

Access of air to the interior of the cover is afforded by the channels 4a which extend through the frame, as shown in Figures 2, 3, and 9. These channels also function to permit escape of such water as may lodge between the lower portion of the cover and the rim of the frame, the seat 4 therefore being at all times free from moisture, and the liability of freezing at this point being overcome.

In a modification of my invention, as shown in Figure 11, the frame and cover structure are identical with those shown in Figure 1, except that the flanges 21 are not provided with notches. The lock mechanism and latch are arranged in horizontal positions and they function in manner the same as hereinbefore described. The latch which is designated by the numeral 48, has its inner end beveled to provide the cam face 49. It is held against rotative movement by a small lug 48a which engages the channel 30. 51 designates a shoulder which limits the distance of the inward movement of said latch. In the opposite sides of the cover, are the apertures 53. These apertures are so located that when the cover is in position with its flanges at place in the recesses 6 and 7, one of said apertures 53 is in registration with the latch 48. To remove the cover the key is operated, thereby moving the bolt to position disengaged from groove 34 of the latch. The user then pulls the latch 48 outwardly to the dotted line position and clear of the cover. (The latch is yieldably retained in the dotted line or unlatched position by the detent 37). The cover may then be turned anti-clockwise,

and as the flanges pass free from the recesses 6 and 7, it may be removed. The measure of the distance of the inward movement of this latch is limited by the shoulder 51.

Upon return of the cover to its position on the seat and with its flanges in the recesses 6 and 7, the latch is pushed in, its end portion making engagement with the aperture 53 of the cover. At this stage, and with the operation of the lock, the bolt 26 is moved into engagement with lock groove 34. Replacing of the cover in position on the frame would be unaffected by the latch having been inadvertently moved inwardly, for the reason that when the cover is being lowered to position, its side comes into engagement with the cam face 49 of the latch, the latter being thereby moved aside.

The modification shown in Figure 12 is intended for use in instances where the nozzle cap is dispensed with. The only change in the cover structure is the providing of a head piece 55 centrally thereof. A headed stem 56 has loosely retained thereon a metal disk 57, upon whose bottom face is secured a composition or cork ring 58 (the latter being of diameter to cover the mouth of the nozzle B and to fit freely within the said cover.) The peripheral portion 57a of said disk is curled upwardly and inturned. Between the said disk and the underside of the said cover, is a coil spring 59. The upper end of the stem is secured in the head piece by a pin or screw 60. By this arrangement, the several parts just described are easily applicable to, and they may be as easily detached from the said cover.

In practice, this modified cover is placed in position on the seat 4 in manner the same as hereinbefore described. The urge of spring 59 causes the cork ring 58 to be held firmly seated on the mouth of the nozzle. Diffusion of such content of the tank as may splash or ooze through the opening through which the stem 56 is passed, is prevented by the upturned edges 57a of said disk, and drainage into the nozzle is facilitated by the perforations 61 which are provided in the body portion of said disk.

Whereas I have shown what I consider the preferred form of embodiment, and the most desirable form of details, for carrying my invention into effect, I do not wish to be limited particularly in the construction and arrangement of the several parts, nor in the details of construction, as various changes and modifications may be made, within the range of the invention as it is defined in the appended claims, without departing from the spirit of the invention or sacrificing any of its advantages.

What I claim as my invention is—

1. A tank closure device, comprising a frame adapted to be secured to the tank nozzle, a cover removably retained in united re-

lation with said frame, a key operable lock embodied in said frame, a bolt operable by said lock, a latch for the cover, and a spring pressed detent to yieldably retain the latch against movement when the latter is in the unlatched position, the said latch being engageable by the bolt when in the latched position. 70

2. A tank closure device, comprising a frame adapted to be secured to and which encircles and encloses the mouth portion and cap of the tank nozzles, a cover removably retained in united relation with the said frame, a key operable lock embodied in the frame, a bolt operable by said lock, a latch for the cover, and a spring actuated detent to yieldably retain the latch against movement when the latter is in the unlatched position, the said latch being adapted to be engaged and held by the bolt when in the latched position. 75

3. A tank closure device, comprising a frame to encircle and enclose the mouth portion of, and which is adapted to be secured to the tank nozzle, a cover removably retained in united relation with said frame, a key operated lock embodied in the frame, a bolt operable by said lock, a latch for the cover; a spring actuated detent to yieldably retain the latch against movement when the latter is in the unlatched position, the said latch being adapted to be engaged by the bolt when in the latched position, a spring actuated catch which is operable when the latch is in unlatched position, to hold it, and a device on said cover operable when the latter is united with the frame, to move the said catch to position disengaged from the latch and to hold said catch in said disengaged position. 80

4. A tank closure device, comprising a frame adapted to be secured to the tank nozzle, a cover to enclose the mouth portion of the nozzle and which is retained in united relation with the said frame, a key operated lock embodied in the frame, a bolt operable by said lock, a latch for the cover, a detent to yieldably retain the latch against movement when the latter is in the unlatched position, the said latch being engageable by the said bolt when in the latched position, a catch which is operable when the latch is in the unlatched position, to hold it, and a cam on said cover operable when the latter is united with the frame, to move the said catch to, and then to hold it in position disengaged from the said latch. 85

5. A device of the kind described, comprising a frame adapted to encircle the nozzle and to be secured thereto and having opposed integral housings provided with facing curvilinear recesses and said frame having an annular seat, a dome shaped cover having opposed transverse flanges, each being provided with a notch, said cover being adapted to rest loosely upon said seat and 90

being movable to position whereby the
flanges thereof occupy the aforesaid recesses,
a key operated lock embodied in one of the
said housings, a bolt operable by said lock,
a latch operable to engagement with the
5 notch of the cover flange, a spring actuated
detent to yieldably retain the latch against
movement when the latter is in unlatched
position, the said latch being engageable by
the bolt when in the latched position, a catch
10 which is operable when the latch is in un-
latched position to hold said latch, and
means carried by the cover so operable that
when the latter is moved to position with its
flanges engaged by the housings, the said
15 catch is moved to and held in position disen-
gaged from the said latch.

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