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SAFETY DEVICE FOR TANKS.

APPLICATION FILED APR. 25, 1918. RENEWED AUG. 9, 1920.

1,372,062. **Patented Mar. 22, 1921.**

Fig. 1.

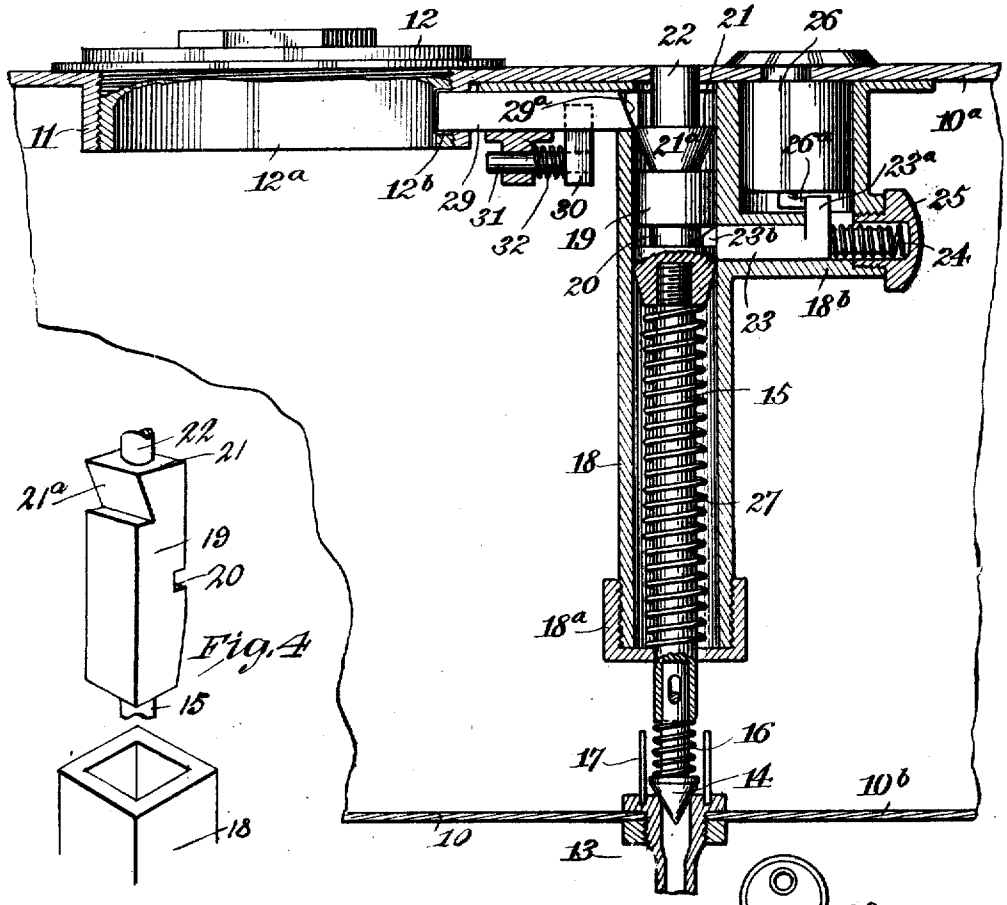
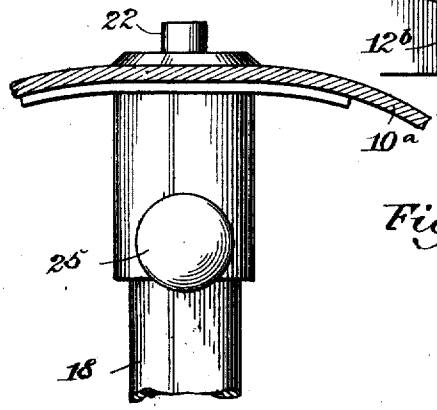


Fig. 4

Fig. 3.



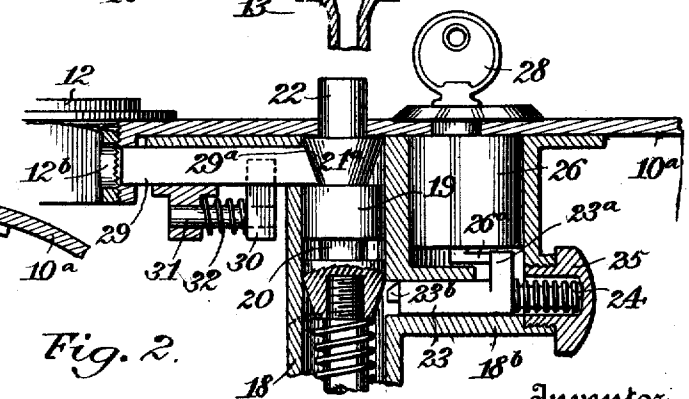


Fig. 2.

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SAFETY DEVICE FOR TANKS.

1,372,062. Specification of Letters Patent. Patented Mar. 22, 1921.

Application filed April 25, 1918, Serial No. 230,852. Renewed August 9, 1920. Serial No. 402,503.

To all whom it may concern:

Be it known that I, WILLIAM G. CARRUTH, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Safety Devices for Tanks, of which the following is a specification.

This invention relates to improvements in safety devices for tanks, and has particular relation to devices operative in connection with fuel supply tanks for motor vehicles. The invention may be considered as an anti-theft structure in that it is designed primarily for two purposes, viz: (*a*) as a means for preventing theft of the motor vehicle itself through closing the supply of fuel from the tank to the carbureter, and (*b*) the prevention of theft of fuel from the tank itself.

Various means have been employed in an attempt to prevent passage of fuel from the tank to the carbureter, these generally being arranged with a valve interposed within the pipe line leading from the tank to the carbureter, the purpose being to close this valve when the vehicle is unattended, a suitable locking device being employed to lock the valve in its closed position, a key being employed to open the valve when it is desired to again use the vehicle. This type of apparatus has the disadvantage of locating the valve structure external of the tank, making it possible to tap the line on each side of the valve and by-pass the fuel through a separate connection. While attempts have been made to meet this condition by locating the valve or closure within the tank—at the outlet for the tank contents—such structures have heretofore been of a type which are more or less complicated in operation, thus practically eliminating the advantages obtained by reason of the fact that the necessity for careful manipulation, etc., generally causes the owner to discard the apparatus as more or less of a nuisance. In addition, the structures heretofore employed in this type have usually been located in alinement with the filling opening, with the result that the structures offer more or less of an obstruction during the filling operation. Furthermore, the structures employed in the latter type, while having the closure located within the tank, generally have the locking mechanism external of the tank and therefore accessible in a manner to permit of manipulation to move the closure to an open position.

The present invention is designed to provide a structure in which the closure is located within the tank, but, in addition, the operating means is arranged in such manner that the locking structure is also located within the tank with the arrangement such that when the closure is seated, no structure is exposed in a manner which will enable manipulation to move the closure from its seat excepting by one having a key operative to release the internal locking means. In addition, the structure is arranged out of alinement with the filling opening in order that no obstruction to the filling operation may be had.

In addition to thus providing a positive closure for the outlet of the tank directly under the control of the owner, I provide an anti-theft structure for preventing theft of the fuel contents of the tank through the filling opening, thus reducing the loss due to this practice. The structure for this purpose operates to lock the closure for the filling opening against removal, with the lock also arranged internal of the tank.

In practice, the invention contemplates the use of both structures with common operating and control means, so that when the owner desires to render the anti-theft mechanism active it will become active at both points, both being made inactive concurrently.

Another feature of the invention is a structural arrangement such that no tools or keys need be employed to render the structural active, a projecting element being moved into a more or less housed relation to the tank when it is desired to provide activity, this movement automatically bringing into operation a locking structure which retains the parts active until a releasing mechanism is made active, the latter releasing the holding means and permitting the locking and closing devices to pass to inactivity.

To these and other ends, therefore, the nature of which will be readily understood as the invention is hereinafter disclosed, said invention consists in the improved construction and combination of parts hereinafter more fully described, illustrated in

the accompanying drawings, and more particularly pointed out in the appended claims.

In the accompanying drawings, in which similar reference characters indicate similar parts in each of the views:

Figure 1 is a sectional view taken through a portion of a tank, showing the parts in position to close the outlet and lock the closure for the filling opening.

Fig. 2 is a fragmentary sectional view of parts shown in Fig. 1, the parts being shown in a different position—practically at the completion of the releasing movement provided by the key.

Fig. 3 is a view partly in section and partly in elevation indicating a way in which the apparatus may be applied to a tank having curved walls.

Fig. 4 is a fragmentary perspective view showing a change in cross-sectional configuration in some of the elements.

In the drawings, 10 indicates a tank of suitable formation, such for instance as that for containing the fuel for a motor vehicle, the tank being shown as having an upper wall 10^a and a lower wall 10^b, it being understood, of course, that these terms are more or less relative. The upper wall is shown as carrying a depending flange 11 to form the filling opening for the tank, the flange being shown as threaded to receive a closure 12 having a skirt 12^a adapted to be threaded to flange 11. Wall 10^b carries the fuel outlet, the latter being indicated as provided by a fitting 13, secured to the wall and having a fuel passageway extending therethrough, the inner end of the passageway being located within the tank and having a form adapted to provide a seat for a closure shown as in the form of a valve 14. The fitting is connected up to the usual connections leading to a carbureter (not shown.)

Valve 14 is yieldably supported in any suitable manner by a stem 15, said stem, for illustrative purposes only, being shown as recessed at its lower end to receive the shank of the valve, the recess and shank being formed to permit relative movement in the direction of length of the stem, any suitable means for this purpose being adapted to be employed, that shown being in the form of a pin and slot connection, this arrangement permitting a limited length of movement of the valve to provide a flexible connection between the valve and stem, a spring 16 being mounted on the shank of the valve and tending to retain the valve seated when the stem is being moved downwardly, and at the same time eliminating an absolutely rigid connection between the stem and valve. If desired, fitting 13 may carry pins 17 which tend to guide the valve in its movements.

Stem 15 is mounted within a barrel or hollow casing 18 forming part of a supporting structure for the operating mechanism, this structure being preferably secured to the inner face of wall 10^a, the barrel 18 depending from this wall. The barrel is shown as being provided with a cap 18^a adapted to close the lower end thereof, this cap having an opening for the passage of stem 15.

Secured to the upper end of stem 15 is an actuating and locking member 19, shown as threaded to the stem and being provided with an annular groove 20 and with an inverted cone-shaped portion 21 to provide an inclined face 21^a. The upper end of member 19 is shown as in the form of a pin 22 which extends through wall 10^a of the tank.

Mounted in an offset 18^b of the barrel is a locking bolt 23 provided with a lateral projection 23^a and a lug 23^b, the latter being adapted to coöperate with groove 20 to lock the stem in an inward position, bolt 23 being adapted to reciprocate in the offset to permit the bolt to be retracted, a spring 24, interposed between the outer end of the bolt and a closure 25—the spring may be supported on a projection of the bolt—tending to retain the bolt in its inner or locking position but permitting free retracting movements of the bolt, these latter movements being provided by suitable means, that shown being in the form of an actuating member 26^a forming part of a lock structure 26. For purposes of illustration, the lock structure is shown as of the type of the "Yale" lock, the escutcheon of which is located on the outer side of wall 10^a, the tumbler section of the lock being located in a casing structure positioned above offset 18^b, projection 23^a extending through an opening in the housing of bolt 23 and into the path of movement of actuating member 26^a.

The normal position of stem 15 is approximately that shown in Fig. 2 in which the upper face of cone-shaped portion 21 is in proximity to the inner face of wall 10^a, pin 22 projecting a suitable distance above said wall. This view illustrates the position of parts at the time when bolt 23 has been retracted, stem 15, member 19 and valve 14 being moved upward to this position by the action of a spring 27 surrounding stem 15, retraction of bolt 23 being had by the turning of a key 28 to operate actuating member 26^a, the connected structure, which includes member 19, shifting to this position as soon as lug 23^b has passed out of groove 20. These locks are generally of a type which provide for return movement of the key to restore the actuating element 26^a to normal position, and in the present instance, this return movement permits bolt 23 to move inward under the action of spring 24 until the advance end of lug 23^b passes into contact with member 19 below groove 20, the normal position of bolt 23 while the device is inactive.

As will be seen by referring to Fig. 1, the length of relative movement between the valve and stem 15 is less than the distance traveled by member 19, so that while the earlier portion of the movement of stem 15 under the action of spring 27 does not unseat valve 14—spring 16 tending to maintain the valve seated as the stem recedes—continuation of this movement after the completion of the lost motion effect raises valve 14 from its seat and opens the outlet through fitting 13. When it is desired to close this outlet, it is necessary only to move pin 22 to the position shown in Fig. 1, thus moving the entire connected structure including valve 14 and groove 20, the inward movement of the pin continuing until lug 23^b again enters groove 20, valve 14 having in the meantime been seated. Lug 23^b and member 19 below groove 20 are preferably provided with inclined faces, so that during this downward or inward movement of member 19, bolt 23 will be moved outward to permit member 19 to pass to proper position, whereupon spring 24 will act to throw bolt 23 inward to locate lug 23^b in groove 20.

The proportions of parts is preferably such that in the inward or locking position of member 19, the upper or outer end of pin 22 will be substantially flush with the outer face of wall 10^a although this is not essential.

As will be seen, the movement of member 19 so as to seat valve 14 is not dependent upon the use of key 28, pin 22 being moved from the position of Fig. 2 to that of Fig. 1 by pressure applied by the hand or foot of the operator, depending upon the particular location of the device, the locking action taking place automatically with the locking mechanism located entirely within the tank and so located as to prevent tampering therewith from the exterior of the tank. Hence, the lock and key structure is employed only in connection with the movement of bolt 23 to release the locked condition of member 19, whereupon said member automatically returns to position to unseat valve 14.

In addition to controlling the outlet, member 19 is arranged to provide for locking closure 12 against an opening movement of the closure, this being provided by the use of a locking bolt 29 which is movable in an opening in flange 11 and into an opening 12^b formed in the skirt 12^a of the closure member, said opening (which may be a recess) preferably having a configuration which will permit of a small movement of the closure when the bolt is in its inner or locking position, this arrangement being provided in order to take care of possibilities of threading movement of closure 12 not being precisely the same in each instance when restored to position after having been removed, small changes in this respect not preventing proper entrance of the inner end of bolt 29 into the opening or recess.

The opposite end of bolt 29 is provided with an inclined face 29^a which coöperates with face 21^a of member 19 to control the position of bolt 29, the latter having a lateral projection 30 carrying a guide pin 31, the latter in turn carrying a spring 32 interposed between a stationary part of the supporting structure and projection 30, this latter arrangement being such as to tend to retain bolt 29 in its inactive position as shown in Fig. 2, in which bolt 29 is shown as retracted to a position where closure 12 can be unscrewed for filling purposes.

When, however, pin 22 is moved inward, faces 21^a and 29^a coöperate to cause bolt 29 to move to the position shown in Fig. 1, the length of face 21^a being such that with member 19 in its inner position, a portion of face 21^a remains in contact with face 29^a, thus retaining bolt 29 in its projected position.

It will thus be seen that I have provided a device which, in inactive position, leaves the closure for the filling opening free to be opened, and valve 14 for the outlet to the tank entirely open, thus permitting the ordinary operations. If, for instance, the user of the automobile desires to place the device in its active position where supply of fuel to the carbureter is cut off, pin 22 is depressed and automatically locked in its depressed position, thus closing the supply outlet for the carbureter, and at the same time projecting bolt 29 into the skirt of closure 12 to prevent removal of the closure, the parts remaining in this position until actuating member 26^a is operated to retract bolt 23, when the device automatically passes to inactive position. As before pointed out, this movement of member 26^a is had by the use of a proper key, the function of which is simply to restore the inactivity of the device, there being no necessity for key manipulation when member 19 is moved to its locked position.

As will be seen, substantially the entire mechanism is located offset with respect to the filling opening, the only structure which may extend into that opening being bolt 29, and this bolt is normally retracted out of the opening, so that when closure 12 is removed, the entire filling opening is unobstructed, permitting the use of any desired means for filling operations.

In Fig. 3 I have indicated the manner in which the parts may be secured to a curved wall 10^a.

As will be understood, the particular form of lock employed is not material to the invention, it being essential only that an actuating member (as for instance 26^a or its equivalent) be presented at a point where it may be made effective on projection 23^a.

It will also be understood that the particular configuration of parts shown may be varied. For instance, barrel 18 may be of angular cross-section, as shown, for instance, in Fig. 4, in which case member 19 would have a complemental configuration, and groove 20 need simply be a slot in one wall and face 21ª provided in another wall, these being obviously equivalent structures. And I also desire it to be understood that I do not limit myself to the more or less yieldable connection between the valve and stem, since it is obvious that the pin and slot connection between the stem of valve 14 and stem 15 may be omitted, together with spring 16, if found desirable, valve 14 and stem 15 being permanently secured together, thus providing a rigid connection between the valve 14 and stem 15, although it is preferred that the connection be in some form of a yielding or lost motion connection.

While I have herein shown and described a preferred arrangement and construction of parts, it will be readily understood that changes and modifications therein may be found desirable or necessary in meeting the exigencies of use, and I desire to be understood as reserving the right to make any and all such changes or modifications, in so far as the same may fall within the spirit and scope of the invention as expressed in the accompanying claims when broadly construed.

What I claim is:

1. The combination with a tank having a filling opening and an outlet, and a removable closure for the filling opening, of movable means within the tank for concurrently closing the outlet and locking said closure against opening movement, said means including a normally-inactive latching structure rendered active by means movement in providing the closing and locking action.

2. The combination with a tank having a filling opening and an outlet, and a removable closure for the filling opening, of shiftable means within the tank for concurrently closing the outlet and locking said closure against opening movement, said means being rendered active at will and including an element permanently carried by said means and projecting from the tank during means inactivity, said element being shiftable to render said means active.

3. The combination with a tank having a filling opening and an outlet, and a removable closure for the filling opening, of shiftable means within the tank for concurrently closing the outlet and locking said closure against opening movement, said means being normally inactive and rendered active at will, and normally-inactive mechanism rendered active by means movement to activity for maintaining such means activity, said mechanism being operative to restore means inactivity at will.

4. The combination with a tank having a filling opening and an outlet, and a removable closure for the filling opening, of shiftable means within the tank for concurrently closing the outlet and locking said closure against opening movement, said means being normally inactive and rendered active at will, and a normally-inactive lock-structure rendered active by means movement to activity for maintaining such means activity, said lock structure being operative to restore means inactivity at will.

5. The combination with a tank having a filling opening and an outlet, and a removable closure for the filling opening, of shiftable means within the tank for concurrently closing the outlet and locking said closure against opening movement, said means being normally inactive and including an element projecting from the tank during means inactivity and shiftable to render the means active, and mechanism coöperative with the means in maintaining the closed and locked condition and operative in the restoration of means inactivity, said mechanism being normally inactive and rendered active solely in the presence of such condition.

6. The combination with a tank having a filling opening, an outlet located out of alinement with the opening, and a removable closure for the filling opening, of means for concurrently closing the outlet and locking said closure against opening movement, said means including an element adapted to coöperate with said closure, said element being positioned to prevent obstruction of the filling opening.

7. The combination with a tank having a filling opening, an outlet located out of alinement with the opening, and a removable closure for the filling opening, of normally-inactive means within the tank for locking said closure against opening movement, said means including a locking bolt within the tank and shiftable to coöperate with the closure to lock the closure, said bolt being positioned to prevent obstruction of the filling opening, and mechanism operative at will to release said bolt from its locking position to permit closure movement.

8. The combination with a tank having a filling opening, an outlet located out of alinement with the opening, a removable closure for the filling opening, said closure having a skirt and an opening within the skirt, of means for locking said closure against opening movement, said means including a locking-bolt within the tank and shiftable into and out of said opening, said bolt being positioned to prevent obstruction

of the filling opening, a member shiftable in directions angular to the direction of movement of the bolt to control the movements of the latter, and means for controlling the movements of the member.

9. The combination with a tank having an outlet, of a closure for said outlet, and means for controlling the movements of said closure, said means including an element adapted to be reciprocated in the direction of closure movement, said element carrying the closure, a locking bolt movable in directions angular to the direction of element movement, said element and bolt having complemental means for locking the element in position to retain the closure active, said bolt being normally inactive, said element having a member normally projecting from the tank when the closure is inactive and shiftable inwardly to render the bolt and closure active, and means for retracting said bolt to permit element movement to shift the closure to inactive position.

10. The combination with a tank having an outlet, of a closure for said outlet, and means for controlling the movements of said closure, said means including an element adapted to be reciprocated in the direction of closure movement, said element carrying the closure, a locking bolt movable in directions angular to the direction of element movement, said element and bolt having complemental means for automatically locking the element in position to retain the closure active, said bolt being normally inactive, said element having a member normally projecting from the tank when the closure is inactive and shiftable inwardly to render the bolt and closure active, and means for retracting said bolt to permit element movement to shift the closure to inactive position.

11. The combination with a tank having an outlet, of a closure for said outlet, and means for controlling the movements of said closure, said means including an element adapted to be reciprocated in the direction of closure movement, said element carrying the closure by a lost-motion connection, a locking bolt movable in directions angular to the direction of element movement, said element and bolt having complemental means for locking the element in position to retain the closure active, said bolt being normally inactive, said element having a member normally projecting from the tank when the closure is inactive and shiftable inwardly to render the bolt and closure active, and means for retracting said bolt to permit element movement to shift the closure to inactive position.

12. The combination with a tank having a filling opening and an outlet, and a closure for the filling opening, of normally-inactive mechanism for closing said outlet and for locking said closure against opening movement, said means including a shiftable element carrying a valve for said outlet, a locking bolt movable into and out of engagement with said closure, said bolt and element having complemental means for shifting said bolt into locking relation to the closure by element movements, a normally-inactive locking bolt for said element, said latter bolt and the element having complemental means for automatically locking the element in position to retain the outlet closed and the closure locked and rendered active by shifting of the element, a member carried by the element and normally projecting from the tank for shifting the element, and means for shifting the element locking bolt to permit element movement to render the mechanism inactive.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM G. CARRUTH.

Witnesses:
WILLIAM HARSTEDT,
P. H. MCGIEHAN.