

Aug. 3, 1943.

H. W. BAILEY ET AL

2,326,003

TANK CLOSURE

Filed Dec. 5, 1941

2 Sheets-Sheet 1

Fig. 1.

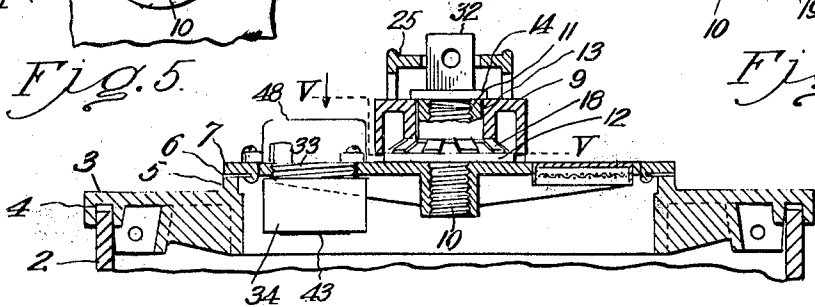
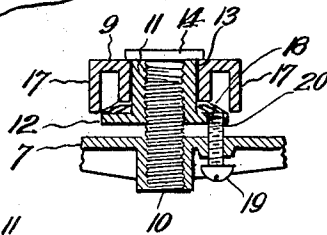
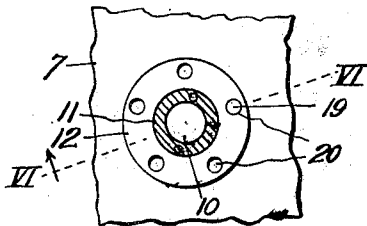
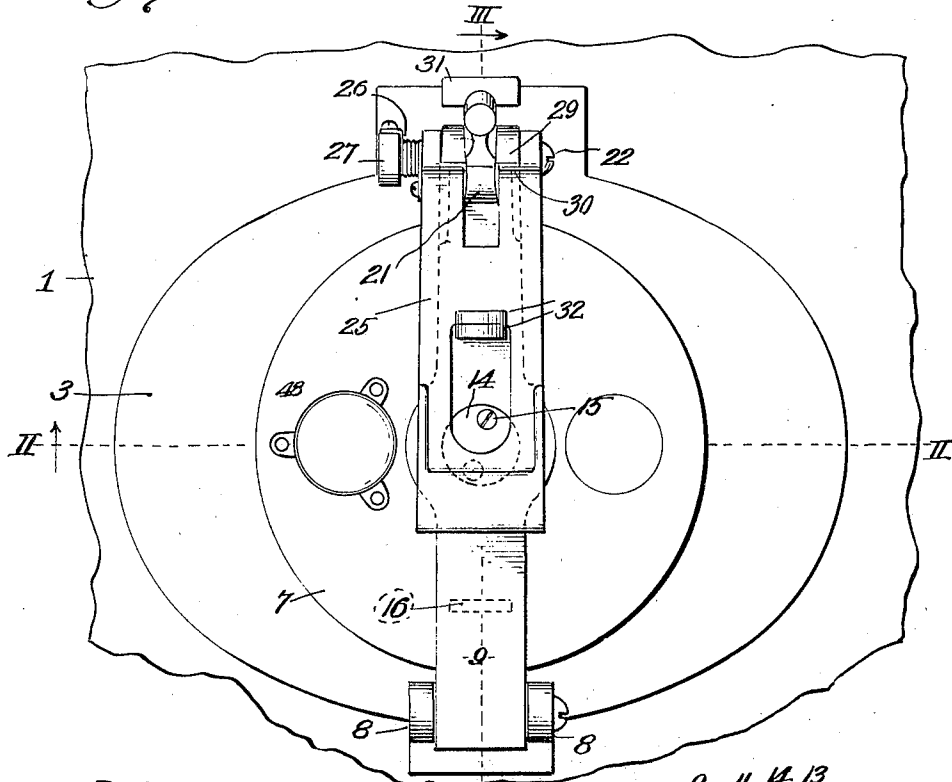


Fig. 2.

Inventors

H.W. Bailey and G.A. Clay.

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Thorpe Thorpe
Atto

Attorneys

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Fig. 3.

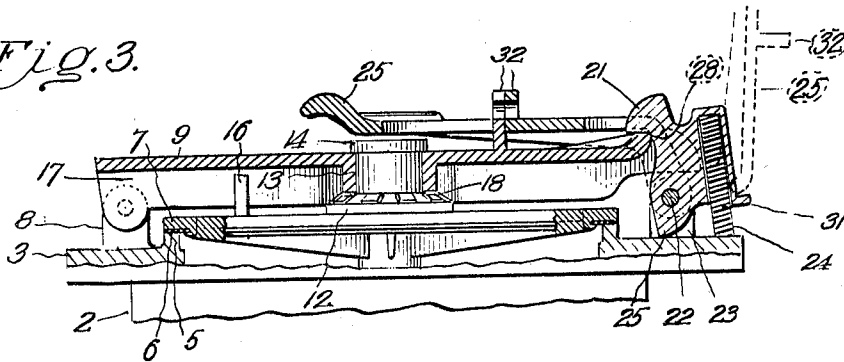


Fig. 7.

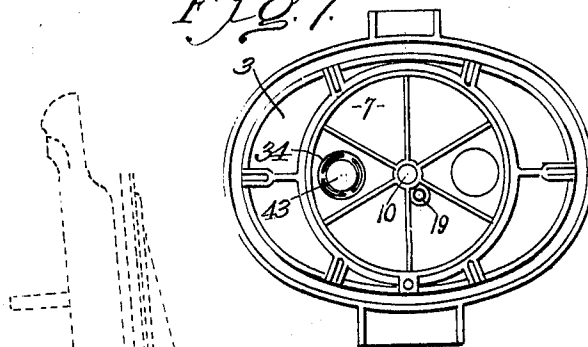


Fig. 4.

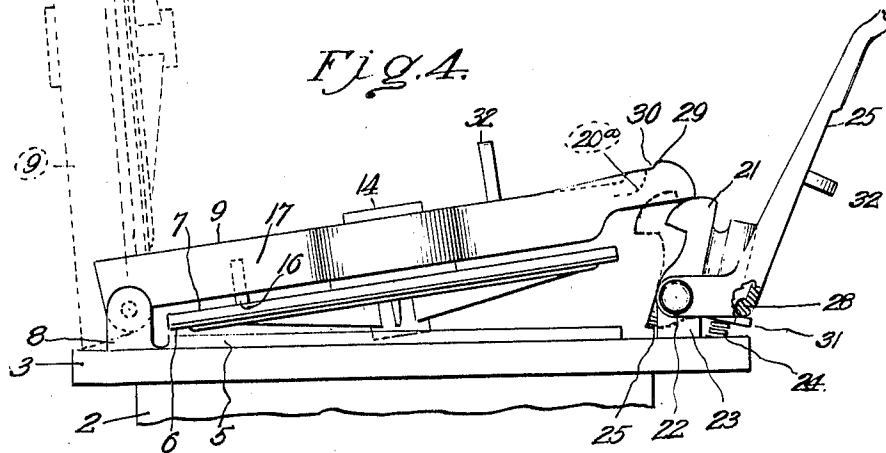
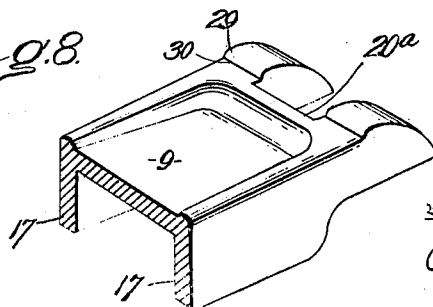


Fig. 8.



Inventors
H. W. Bailey & G. A. Clay.

Thorpe & Thorpe
Attorneys

UNITED STATES PATENT OFFICE

2,326,003

TANK CLOSURE

Harry W. Bailey and George A. Clay,
Kansas City, Mo.

Application December 5, 1941, Serial No. 421,831

3 Claims. (Cl. 220—57)

This invention relates to tank closures, such as manhole covers having a filling opening and a closure to reliably seal the filling opening. The chief object of the invention is to produce a construction of the character mentioned provided with a latch mechanism which will automatically clamp the closure in closed position upon the starting of a tank wagon or the like, should the driver overlook shutting the closure.

Another object of the invention is to provide means to be manually actuated for the better sealing of the filling opening, such means being also actuatable for the unlatching of the closure when it is desired to fill the tank.

A further object of the invention is to provide a resilient adjustable connection between a strong-back and closure so that adjustment may be readily made to accommodate wear on the parts to insure automatic latching of the closure when it is swung to closed position.

With the general objects named in view and others as will hereinafter appear, the invention consists in certain novel and useful features of construction and combination of parts as hereinafter described and claimed; and in order that it may be fully understood, reference is to be had to the accompanying drawings, in which:

Figure 1 is a fragmentary top plan view of a tank equipped with a cover embodying the invention.

Figure 2 is a vertical section on the line II—II of Figure 1.

Figure 3 is a vertical section on the line III—III of Figure 1.

Figure 4 is an elevational view disclosing the cover and the locking mechanism in unlocked relation, and also showing the cover and the hinged closure support dotted in position giving full access to the tank opening.

Figure 5 is a horizontal section on the line V—V of Figure 2.

Figure 6 is a vertical section on the line VI—VI of Figure 5, to show means to prevent rotation of the closure.

Figure 7 is a reduced inverted plan view of the cover carrying frame for attachment to a tank.

Figure 8 is a fragmentary perspective view of the hinged closure support.

In the said drawings, where like reference characters identify corresponding parts in all of the figures, 1 is a tank having an opening fitted with a combing or collar 2. Secured upon the combing in any suitable way is a manhole cover 3, having a groove on its underside fitted with a gasket 4 in sealing engagement with the edge of the combing 2. Of course, the manhole cover 3 can be integral with the combing if it is not desired to provide a man-way into the tank. The manhole cover 3 has a central filling opening

surrounded by an upstanding flange 5, whose upper end provides a seat for sealing engagement with a gasket 6 carried by a filling opening closure 7.

At one side of the closure 7, the cover 3 is provided with a pair of upstanding ears 8 between which, one end of a strong-back arm 9 is pivoted, said strong-back 9 overlying the closure 7. The connection between the strong-back and the closure is preferably more or less resilient to insure firm sealing of the filling opening, said resilient connection, by preference, comprising a threaded stud 10 non-rotatably upstanding from the center of the closure 7. Threaded on said stud 10 is an externally cylindrical nut 11 having a flange 12 at its lower end, and having its body or cylindrical portion rotatable within an opening 13 in the strong-back. The nut 11 is held in position and the closure is held to the strong-back by means of a plate 14 detachably secured to the nut 11 by screws 15, said plate being of greater diameter than the opening 13 and overlying the upper face of the strong-back. This arrangement swivels the closure to the strong-back and permits adjustment of the nut 11 on the stud 10, by engaging a spanner or the like with the holes which receive the screws 15. To prevent rotation of the closure in relation to the strong back, the former is provided with an upstanding ear 16 received between depending flanges 17 of the strong-back.

Resiliency of the connection between the closure and strong-back is secured by interposing a spring washer 18 between the nut flange 12 and the lower face of the strong-back. To effect adjustment of the spacing between the closure and strong-back, the nut 11 is run backwardly or forwardly on the stud 10, and then is locked in the desired position through engagement of a set screw 19 carried by the closure 7 with any of a series of perforations 20 in the flange 12 of the nut 11. By preference, the parts are so proportioned and positioned that when the closure 7 is fully open, the strong-back 9 stands at approximately ninety-one degrees from the horizontal so that the slightest jar or vibration will overbalance the closure and cause it to fall to closed position over the filling opening.

To insure locking the closure 7 in sealed position after it has been closed, the strong-back 9 and the cover 3 are provided with cooperable latch mechanism, which, by preference, includes bifurcating the free end of the strong-back 9 to form a keeper 20a therebetween. The keeper is adapted to interlock with a catch 21 (Figure 3), pivoted on a pin 22 carried by ears 23 upstanding from the cover 3. The catch 21, when unrestrained, is always advanced to locking position intercepting the path of travel of the keeper 20a under the impetus of a catch-advancing

spring 24, the pivotal movement of said catch being limited by a stop extension 25 which by engaging the cover 3, prevents the spring 24 from advancing the catch too far for engagement with the keeper 20a. It will be apparent with this construction that as wear occurs on the gasket 6 and the cooperating faces of the catch 21 and keeper 20a, the distance between the strong back 9 and the closure 7 may be adjusted through manipulation of the nut 11, to insure that the keeper, in the closing movement, will move far enough to permit the catch to override and hook over the same. It will be noted that the fall of the strong-back from its upright position or if the strong-back is fully lowered by hand pressure, the keeper 20a effects repression of the catch (Figure 4), through engagement with the upper curved face of the catch, the latter instantly returning and overlying the upper face of the keeper under the action of its spring 24 (Figure 3).

In order to insure firm seating of the closure 7 if the adjustment between the closure and strong-back is not close enough to insure against vibration or up and down movement of the closure 7 and its gasket 6 in relation to the edge of the flange 5, or merely as a precautionary measure or double lock, and also to provide convenient means for manually unlatching the closure 7 for filling the tank or the like, the hinge pin 22 is extended beyond the ears 23 to provide a pivot for a manually operable sealing, locking and unlocking lever 25a. This lever 25a, when free, is spring-positioned at a determined point, preferably upright, for convenience of operation, by the reaction of a coiled spring 26 encircling the pivot pin 22, one end of the spring abutting the lever 25 and its other end abutting a stop or ear 27 carried by the cover 3.

The lower end of the lever 25a is bifurcated to straddle the catch 21, and said bifurcated portion terminates in a cam surface 28 for cooperation with a pair of cam surfaces 29 on the bifurcated front end of the strong-back 9. The strong-back cam surfaces 29 terminate in a pair of locking notches 30 for engagement with the lever cam 28, as will hereinafter appear. When the lever 25a is manually swung in one direction against the tension of its spring 26, clamping coaction between cams 28 and 29 is effected, this action pressing the strong-back down against the spring washer 18 and tightening the closure 7 on its seat 5. The parts, by preference, are so proportioned that during the first part of the travel of cam 28 on cams 29 the action is to compress spring washer 18 as stated, but just before the cam 28 reaches the locking notches 30, the effective centers of rocking movement of the cams decreases, so that spring washer 18 slightly reacts to snap the cam 28 into their seats in notches 30 and thus reliably holds the lever 25 in substantially horizontal position and prevents the same from vibrating.

To release the closure latch (keeper 20a and catch 21), to permit opening of the closure 7, manual pressure applied to lever 25a in the reverse direction to that above described, causes the rounded rear portions of its cam 28 to strike an extension foot 31 on the catch 21. Continuation of movement of lever 25 rocks the catch 21 to disengage it from the keeper 20a, and thus unlatches the strong-back so that it can be swung

back to open the tank. If desired the strong-back 9 and the locking lever 25 may be provided with cooperating upstanding ears 32, 32a respectively for engagement with a padlock hasp (not shown) to lock the tank against unauthorized entry.

From the foregoing in connection with the drawings, it will be apparent that we have produced a tank closure embodying the advantages set forth as desirable in the statement of the objects of the invention, and which is presented in the most approved form at present known to us.

We claim:

1. A tank cover having a filling opening, a closure therefor, a strong-back overlying and co-operable with the closure and pivoted at one end to the tank cover, a yielding-advanced latch mounted at a fixed point relative to the cover, for securing the other end of the strong-back to the tank cover, the strong-back terminating at its free end in a cam laterally-offset relative to the latch, and in a keeper in radial alignment with and for engagement by the latch, and also having a transverse notch, a forked lever mounted axially in fixed relation to the cover, with its fork arms straddling the latch and the free end of the strong-back when the same is in closed position, the lever at an intermediate point and within the fork, having a cam for successive engagement with the strong-back cam to depress the same and with said notch to retain the strong-back in depressed position.

2. A tank cover having a filling opening, a closure therefor, a strong-back overlying and co-operable with the closure and pivoted at one end to the cover, and provided at its opposite end with a cam surface tapering toward its free extremity and with a transverse notch at the opposite end of said cam, a nut having holes in its upper end and swivelled in the strong-back, and provided with an external flange at its lower end having a circular series of holes, a spring-washer between and engaging the strong-back and said external flange of the nut, means adjustably carried by the closure and engaging a selected hole of said flange, a plate detachably capping the upper end of said nut and resting upon the strong-back and rendering the holes in the upper end of the nut inaccessible for adjustment of the nut for affecting the tensional force exerted by the washer to effect approaching or receding relation between the strong-back and the closure.

3. The combination between a strong-back and a tank-opening closure underlying the strong-back, a threaded plug projecting from the center of the closure, a nut threaded on the stud and rotatably mounted in the strong-back and provided at its lower end with an external flange having a circular series of holes, a spring between and engaging said flange and the underside of the strong-back, a plate detachably secured to the upper end of the nut and overlapping the upper side of the strong-back, and means adjustably mounted on the closure to engage or withdraw from one of the series of holes in the nut-flange.

HARRY W. BAILEY.
GEO A. CLAY.