

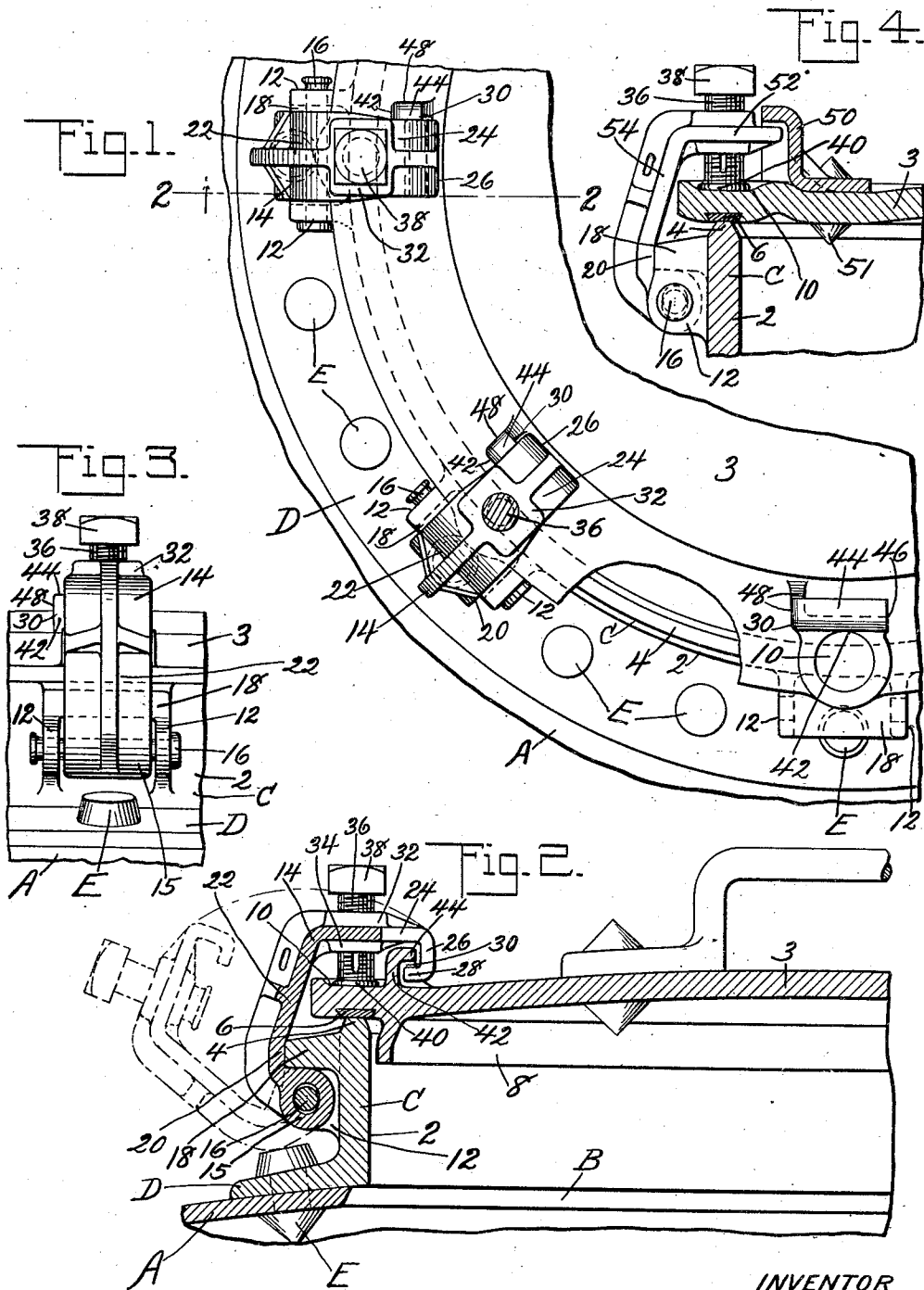
Dec. 9, 1930.

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1,784,480

TANK DOME COVER AND SECURING MEANS THEREFOR

Filed April 9, 1928



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TANK-DOME COVER AND SECURING MEANS THEREFOR

Application filed April 9, 1928. Serial No. 268,666.

Reference is had to the accompanying drawings which illustrate the preferred form of the invention, though it is to be understood that the invention is not limited to the exact details of construction shown and described, as it is obvious that various modifications thereof within the scope of the claims will occur to persons skilled in the art. In the drawings:

10 Figure 1 is a top plan view of a portion of a dome cover seated on a dome ring, showing the invention in plan, certain parts in said figure being shown in section and others removed to more fully disclose the details of the device;

15 Fig. 2 is a sectional view on the line 2--2 of Fig. 1;

20 Fig. 3 is an end elevation of one of the securing elements for the cover showing the manner of attaching the elements to the dome ring, and

25 Fig. 4 is a side elevation of a modified form of the cover securing element and dome cover, the dome cover and dome ring being shown in section.

This invention relates to a tank dome closure and has particular reference to securing means therefor.

30 One object of the invention is the provision of a securing means for pressed metal dome covers.

35 Another object of the invention is the provision of a securing means for dome covers in which the line of force thereof is exerted in a vertical direction in line with the dome ring.

40 A still further object of the invention is the provision of means for securing a dome cover to a dome ring, said means comprising securing bolts which are so positioned that in their fastening position they are arranged directly above and in line with the dome ring thus relieving the remainder of the dome cover of any stresses.

45 Another object of the invention is the provision of a supporting means for cover securing elements, which is hingedly mounted and is so arranged that when the securing means are in operative position, the hinge joint is relieved of all strains.

This invention also contemplates the provision of securing means for tank dome covers which cannot be released from attachment with the cover while there is excess pressure in the tank.

Another object of the invention is the provision of a novel means of securing pressed metal dome covers to a dome ring or the like which is inexpensive to manufacture and strong and durable in operation.

Other objects and advantages of this invention will be apparent from the following description taken in conjunction with the accompanying drawings, in which A indicates generally the head of a tank dome, a very small portion thereof only being shown, the same being provided with the usual opening B, while C indicates generally a dome ring having a flange D secured to the head A by rivets E.

The vertical portion of the dome ring is indicated at 2, while the cover of the dome is shown at 3 in Fig. 2. This dome cover is formed of suitable metal cast into the form shown more clearly in Fig. 2, and is formed of such size as to overlie the dome ring C, more specifically the vertical flange 2 thereof, and the upper edge of the vertical flange 2 is preferably flattened as at 4 to provide a seat for the cover 3. The underface of the cover is provided with an annular recess, undercut at its sides, and in said recess is positioned a suitable packing 6 to effect a seal between the cover and the dome ring, as will be apparent. The cover 3 is formed with a depending annular centering and reinforcing flange 8 arranged to lie within the dome ring C as clearly shown in Fig. 2.

The cover is also provided with spaced recesses or depressions 10 arranged circumferentially around the cover and so positioned that they lie immediately over the dome ring C for a purpose to be presently described.

Extending outwardly from the dome ring are a plurality of spaced pairs of ears between each of which pairs is hingedly mounted a casting in the form of an arm 14 serving as a screw carrying element. The screw carrying elements or arms 14 are preferably of the form shown clearly in Fig. 2

and each comprises an attaching end 15 which may be termed a retainer extension, apertured to receive a pintle 16 which is supported by the spaced ears 12. As clearly shown in Fig. 2, the apertures are elongated vertically there-
 5 by providing a more or less loose connection of the casting with the pintle 16 for a purpose to be hereinafter described. The ears are connected by means of a flange 18, the forward edge of which defines a stop element
 10 for limiting the upward movement of the casting 14 on the pintle 16 to accurately position said casting, the forward edge of said stop element being adapted to engage within a slight recess or indented area 20 formed in
 15 the body portion 22 of said casting. The lower surface of the flange 18 provides an abutment against which the attaching end 15 is adapted to bind, the attaching end being formed with a shoulder portion 17 ar-
 20 ranged adjacent the area 20; the construction thus providing an angle shaped pocket into which the flange 18 extends. The body portion 22 of the casting or screw carrying element terminates in a bent upper end 24 pro-
 25 viding a screw receiving portion, and the end of the portion 24 is bent downwardly and then reversely backward as at 26 and 28 respectively; the reversely bent end 28 being so
 30 arranged as to be engaged within a socket indicated generally at 30. The screw receiving portion 24 is provided with oppositely extending bearing bosses 32 and 34 respectively through which and through the screw
 35 receiving portion 24 a binding screw 36 threadedly extends. The upper end of the screw is provided with a head 38 and the lower end is upset as at 40 to form a bearing surface which in the securing position of the
 40 screw engages the cover in the depression 10 formed therein.

The socket 30 in the instance disclosed in Fig. 2 faces inwardly or to be more exact faces towards the center of the dome cover 3
 45 and comprises a vertical portion 42 and a horizontal portion 44 which functions as a stop element as hereinafter described. The socket 30 is open at one end as shown at 46 (see Fig. 1) and the opposite end is closed
 50 by a plate 48 which defines an abutment for limiting the rotation of the cover 3.

Referring now to Fig. 4 which discloses a modified form of the invention, it can be seen that the cover 3 is formed of metal pressed
 55 into the desired shape and has secured thereto by rivets 51, the sockets 50 (one only being shown). The sockets 50 are so positioned as to receive the ends of the horizontal or screw receiving portions 52 of castings 54. The
 60 casting 54 shown in Fig. 4 is not provided with the returned end shown in Fig. 2, but otherwise the construction thereof, the cover 3 and the screw are identical and hence the same reference characters are applied thereto.

35 In use, with the cover removed from the

dome ring, the casting is usually thrown to the position shown in dotted lines in Fig. 2. When the cover is positioned on the dome ring C the screws 36 are backed up in their thread-
 70 ed engagement with the screw receiving portions 24 and 52 respectively, and the castings are moved on their hinges to a position over the top of the dome cover. The cover is then rotated to position the returned end 28 shown
 75 in Fig. 2 or the forward edge of the bolt supporting portion 52 shown in Fig. 4, within the sockets formed on the dome cover. It will be apparent that rotation of the cover to the proper position is limited by means
 80 of the abutments at the end of each socket. The dome cover having assumed the proper position, the screws 36 may then be screwed downwardly through the screw receiving por-
 85 tions until their lower ends are engaged within the depressions 10 formed in the dome cover and thus the dome cover is rigidly secured to the dome ring C. When this has been done, it will be apparent that the pressure required
 90 in securing the cover to the dome ring C is exerted in line with the dome ring C; an extremely simple and advantageous construction, as will be apparent. It can further be
 95 seen that as the screws 36 are tightened, the castings 14 are pulled upwardly until the attaching ends 15 bind against the lower sur-
 100 faces of the flanges 18 thus relieving the pintles of all strain.

In releasing the dome cover from its engagement with the dome ring, the screws 36
 105 are backed up in the screw receiving portions, and if there is normal pressure in the tank the cover 3 may be rotated to disengage the ends of the screw receiving portions from the sockets and the castings may then
 110 be swung to the position shown in dotted lines in Fig. 2 and the cover removed. If, however, there is excess gas pressure within the tank, it will be apparent that upon un-
 115 screwing the screws 36 the cover will be forced upwardly and the lower ends of the screws will be retained in the depressions 10 of the cover, thus preventing a rotation of
 120 the cover. Because of the engagement of the lower ends of the screws 36 with the depressed portions 10 of the cover, it will be
 125 apparent that the cover cannot be rotated to free the same from its engagement with the castings until sufficient gas has been vented from the tank to permit the cover to drop
 130 to free the lower ends of the screws from their engagement with the depressions. This construction, therefore, in addition to provid-
 135 ing a simple and easy locking means for the dome cover, provides a safety device which prevents the blowing off of the cover from the ring or a removal thereof from the ring
 140 while there is excess or dangerous pressure within the tank.

What is claimed is:

1. In a tank dome, a dome ring, a cover 140

- adapted to seat thereon, a plurality of sockets on said cover, castings pivotally secured to the dome ring and having a bent upper end adapted to overlie the cover when the castings are swung on their pivots and to be engaged within the sockets, clamping means adjustably mounted in the bent upper ends, and means for limiting the upward movement of the castings on their pivots whereby the clamping means engage the cover at points in line with the dome ring to secure the cover to said ring.
2. In a tank dome, a dome ring, a cover adapted to seat upon the ring and provided with a circumferentially arranged row of depressions adjacent its edge, a socket having one open end arranged on the cover adjacent such depression, clamp carrying elements pivotally secured to the dome ring and adapted to be swung to overlie the cover with the ends thereof positioned in the sockets, and clamping means in said elements for engaging in said depressions to secure the cover to the ring.
3. In a tank dome, a dome ring, an external flange on said ring, a plurality of securing elements pivoted to the dome ring and movable over the latter, said elements having end extensions adapted to overlie the manhole opening of the dome, a dome cover having a plurality of sockets adapted upon rotation of the cover to be engaged by said extensions to normally position said cover, said cover having a plurality of depressions formed along its marginal edge, and clamping elements carried by the securing elements for engaging in the depressions when the cover is in normal position.
4. In a tank dome, a dome ring, a cover normally seated thereon, and means for securing said cover comprising arms pivoted to said dome ring and adapted to swing upwardly so that a portion of each thereof overlies the cover, clamping elements carried by the arms for securing the cover, means intermediate the clamping elements and the pivoted ends of the arms for limiting the upward swing of the latter and for taking the effective upward clamping stresses whereby to relieve the pivots of strain, and means with which said arms engage for preventing removal of the cover upon release of the clamping elements until after venting of excess pressure from the dome.
5. In a tank dome, a dome ring, a cover normally seated on the ring, arms loosely pivoted to the dome ring, clamping elements carried by said arms for engaging the cover to secure the latter on the dome ring, means extending outwardly from the dome ring adjacent the pivots and with which the arms contact when the dome cover is secured to relieve the pivots of strain, said means limiting the upward swing of the arms to position the clamping elements in alignment with the dome ring.
6. In a tank dome, a dome ring, a dome cover, spaced lugs extending outwardly from the dome ring, a pintle in said lugs, a flange connecting said lugs and arranged above the latter, an arm pivotally connected at its lower end to the pintle and adapted to be swung upwardly to position the upper end thereof over the cover, a clamping member carried by the arm for engaging the cover, said arm being capable of vertical movement relative to the pintle when the clamping element is being urged to clamping position whereby said carrying element binds against the flange without transmitting the clamping strain to the pintle.
- In witness whereof I have hereunto set my hand.
- JOHN BEYER.

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