M. A. GARRETT.

TANK CAR DOME COVER.

APPLICATION FILED SEPT. 16, 1920.

1,405,577. Patented Feb. 7, 1922.

2 SHEETS—SHEET 1.

Fig. 1.

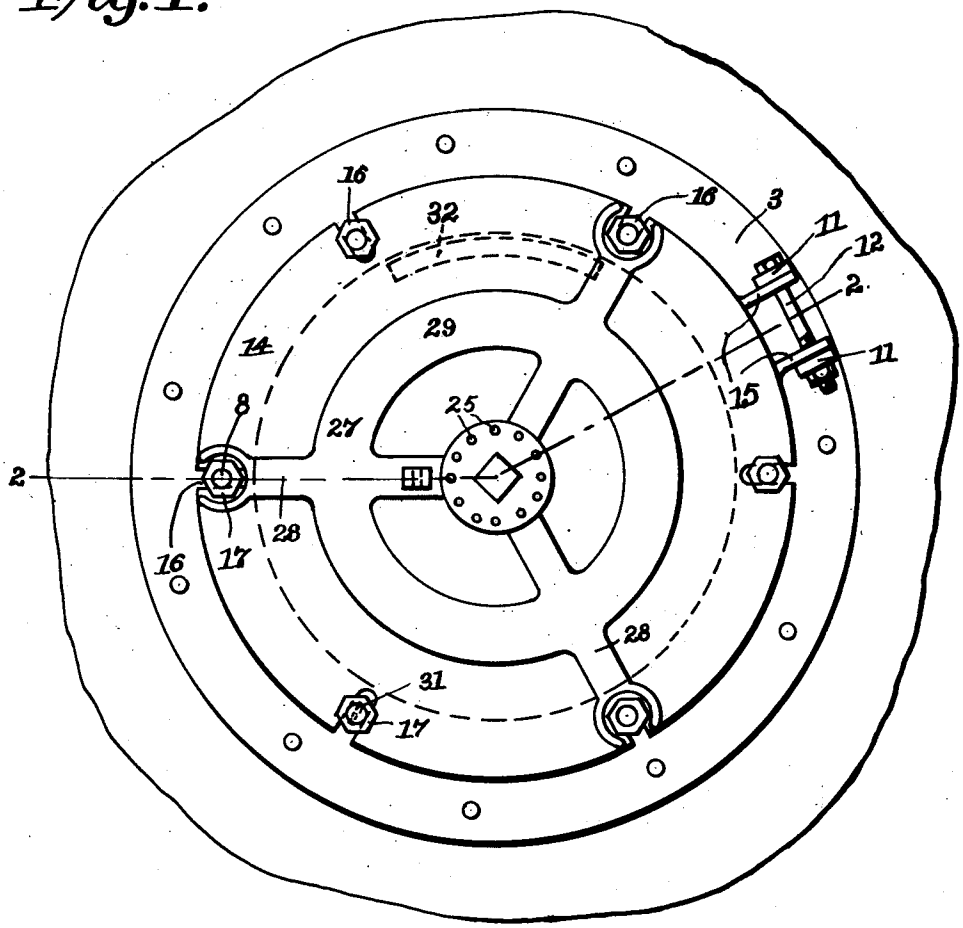


Fig. 2.

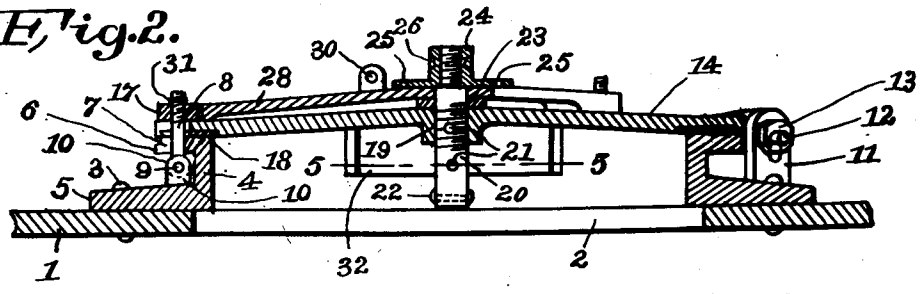
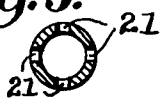


Fig. 5.



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2 SHEETS—SHEET 2.

Fig. 3.

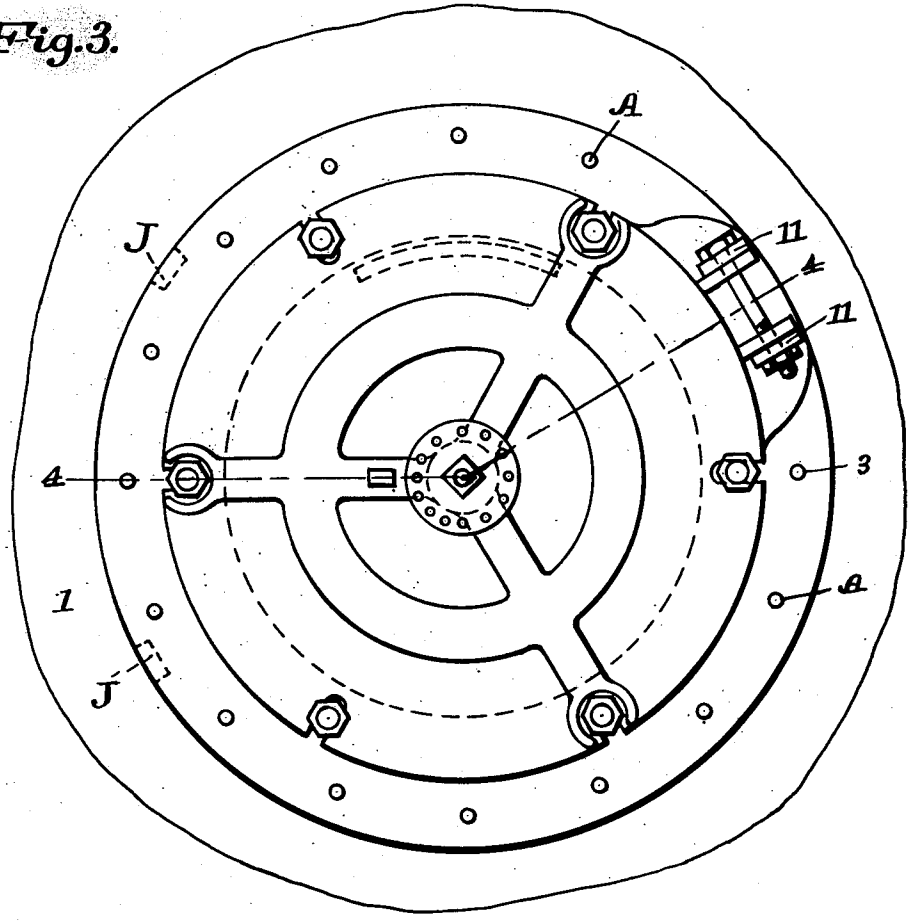
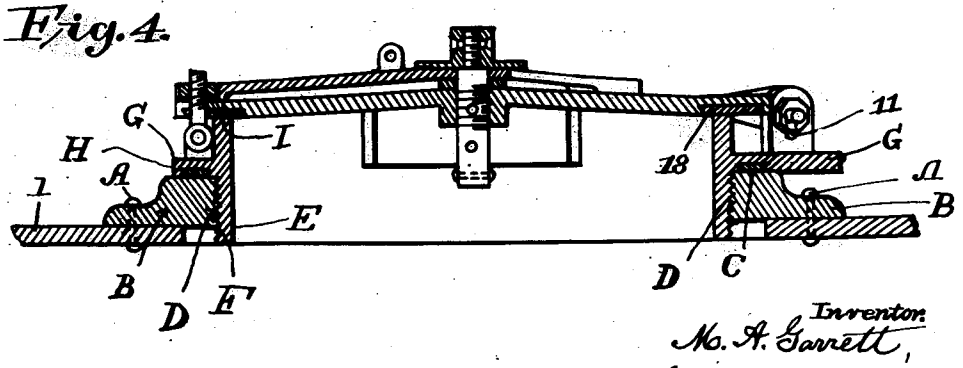


Fig. 4.



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UNITED STATES PATENT OFFICE.

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TANK-CAR-DOME COVER.

1,405,577. Specification of Letters Patent. Patented Feb. 7, 1922.

Application filed September 16, 1920. Serial No. 410,608.

To all whom it may concern:

Be it known that I, MYERS A. GARRETT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Tank-Car-Dome Covers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Most of the dome covers on tank cars now in use are very faulty in design and construction. They are heavy and cumbersome to handle and are screwed in position so that it is difficult to get them down tight, and the result is a very great loss of the loading when volatile as in the case of gasoline. Vapor arises into the dome space, and the pressure of it is so great at times that when the screw cover is being removed frequent and serious accidents occur to the persons manipulating the covers by reason of the cover being blown off before being entirely unscrewed. Besides, there is great loss of the loading of the car inasmuch as the sudden removal of the cover when gas pressure is present throws the loading out of the dome opening. The action is similar to the opening of a bottle of champagne. Because of the weight of the cover, the screwing of it down frequently damages the threads and displaces the gaskets when used to make a tight joint. Even though the cover is screwed down tight, vents or openings are present, due to the defective gaskets and damaged threads. From the foregoing, it is obvious that the cover should be provided with a vent or vents to reduce the gas pressure before loosening the cover, and the arrangement should be such that it will not be possible to move the cover away from the dome opening until the gas pressure within the dome is reduced or entirely removed.

While the screw type of cover has vents in the threaded part of the same which are designed to relieve the gas pressure, nevertheless there is no control of the movement of the cover to forestall possible accidents and loss of loading before the pressure is sufficiently reduced. Men generally will be careless in dangerous situations and therefore a mechanical control is necessary to prevent accidents.

My improved dome cover obviates the imperfections of the type now in use. It allows the escape of gas gradually so there is no dangerous rush thereof which attends a sudden full opening of the vents, or the removal of the cover. It is not screwed in closed position, but is hinged so that it can swing upwardly and back, thus not disturbing or damaging the gasket by frictional circular movement. It is made tight by hinged bolts with nuts which can be readily screwed down tight with an ordinary wrench. The cover being hinged, it can be operated easily as compared with the screw type of cover, and further it cannot be displaced and lost. Some of the nuts of the hinged bolts which clamp the cover in position can not be loosened until the excessive gas pressure has been reduced.

The accompanying drawings illustrate two examples of the embodiment of my invention, one adapted for new cars being manufactured, and the other for old cars wherein my improvement is substituted, the same being constructed and the parts combined according to the best modes of procedure I have so far devised for the purpose.

Figures 1 and 2, the former a top plan view and the latter a vertical section on line 2—2 of Fig. 1, show the first example which is to be embodied in new tank car construction.

Figures 3 and 4, the former a top plan view and the latter a vertical section of Fig. 3 on line 4—4, show the second example where the new cover is adapted for old cars replacing the screw type or cover.

Figure 5 is a cross section enlargement of the hollow plug taken on line 5—5 of Fig. 2.

Referring to the first example, Figs. 1, 2 and 5, the numeral 1 designates the tank car metallic dome head sheet having a circular opening 2. About the edge of the metal defining the opening is secured by rivets 3 a ring 4, having a bottom flange 5, through which the rivets 3 pass, and a flange 6, provided with a plurality of open slots 7 in the edge. Within these slots are located a plurality of threaded bolts 8 which are pivoted at their lower ends by through bolts 9 to perforated pairs of lugs 10 cast integral with the ring 4, as shown. Projecting from the flange 5 of the ring 4 are two perforated upright lugs 11, to which through the medium of a bolt 12 and nut 13 is pivoted a metallic cover 14 which has perforated lugs 15, through which the bolt 12 passes to form

a hinge. The holes in the lugs 11 are elongated or elliptical vertically so the bolt can move vertically and allow the cover to closely fit the top surface of the flange 6, as is obvious.

The cover 14 has open slots 16 in its edge, which register with the slots 7 in the flange 6, whereby the bolts within the said slots, when the nuts 17 are unscrewed, can be turned outwardly to horizontal positions freeing the cover so it can be swung upwardly upon its hinges. Within a recess formed in the under surface of the cover is located a circular gasket 18, which is adapted to engage the top surface of the flange 6 and form an air tight joint.

At the center of the cover is a threaded opening 19, within which is located a removable threaded plug 20. The lower part of the plug is hollow and has top and bottom holes 21 through it in different horizontal planes, as shown by Figure 5. A rivet 22 with projecting heads prevents the plug from being entirely removed from the cover and lost. Upon the plug above the screw threads is a fixed collar 23, and spaced therefrom and above the collar is a nut 24 having a flange with a series of open perforations 25, as shown.

The nut is secured upon the upper end of the plug by a rivet 26 having countersunk heads so as not to interfere with the fit of a wrench. Between the collar 23 and the nut 24 is loosely pivoted, so it can turn about the hollow plug a nut guard 27 provided with a plurality of radial arms 28, each arm at the end having a slot or recess within which is located one of the nuts 17. The arms are united by curved bars 29, as shown, and one arm is provided with a perforated lug 30, through which perforation and one of the holes 25 in the flange of the nut 24 may be passed a wire when the nut is to be sealed against unauthorized movement or removal. If desired, through rivets 31, with projecting heads, may be added to the ends of bolts 17 so the nuts cannot be entirely unscrewed and lost. On the inner surface of the cover and projecting downwardly is a lug 32 which is so located as to serve as a lock to prevent movement of the valve rod operating lever, whether of the vertical or horizontal type, when the cover is closed.

The second example of the embodiment of the invention, Figs. 3 and 4, which is designed to be substituted for the dome covers of old tank cars now in use differs from the example described mainly in the means for securing the ring, against which the cover bears, to the dome head sheet 1, which has a circular opening. About the opening in the dome head sheet is secured by rivets A, a circular casting B, having a plane surface C, and a threaded edge D. This ring may have been in use on old cars to receive the screw-threaded type of cover hereinbefore mentioned. A circular ring E, having screw threads F, a flange G, with a gasket H, and plain edge I, is screwed into the circular casting B until the gasket H closely engages the plain surface C of the casting and forms a permanent tight joint. The edge of the flange G may have a series of recesses J in its edge to receive a suitable tool for use in screwing the ring E in place.

The cover and its attachments are substantially identical with the cover of the first example, and the description of the same need not be repeated. However, it will be noted that the gasket 18 fits the plain edge I of the ring E, and that the flange G carries the two perforated lugs 11, forming part of the cover hinge, the flange being widened as indicated to properly locate the lugs. It will be obvious that the casting B and the circular ring E, having screwthreads F and permanently screwed into the said casting B forms a compound or composite ring which is riveted to the body sheet of the tank car, and that said composite ring is broadly the equivalent of the ring 4 of the first example.

The mode of operation is as follows: Assuming the cover in either example to be closed as shown by the drawings, it will be noted that it fits tightly and has no openings through which gas or liquid can escape. The nut guard prevents the application of a wrench to a plurality of the nuts 17, and when a seal is present, the plug 20 cannot be turned without breaking the seal. To open the cover a wrench is applied to the nut 24 and the same unscrewed from the cover. When the top edges of the top holes 21 in the plug are brought to a position slightly above the top surface of the cover, gas under pressure within the dome can gradually escape until the pressure is sufficiently reduced inside the dome and car. It will be observed that the threads upon the plug 20 are limited in area so as entirely to engage the threads about the hole 19 in the center of the cover only when the plug is screwed down and the collar 23 engages the top surface of the cover. The design is that when the plug has been unscrewed and the threads thereon entirely freed from the threads in the cover, the ends of the arms of the nut guard will be raised above the ends of the bolts 8 far enough to permit the use of a wrench to unscrew the nuts 17, so the bolts 8 may be turned down to horizontal positions and out of the slots, thus allowing the cover to swing upwardly and back upon its hinges.

From the foregoing description, taken in connection with the drawings, it is clear that I have provided an improved cover for the dome opening of a tank car which fulfills the conditions hereinbefore set forth and eliminates the imperfections appertaining to the

type of cover now in use. The cover can be easily and quickly manipulated and it cannot be lost. A very tight joint is formed without openings through which gas or the liquid contents of the car can escape. The gaskets will not be injured in manipulating the cover. The nuts on some of the bolts cannot be unscrewed till the central plug has been unscrewed. Provision is made for allowing the gradual reduction of gas pressure within the dome and car before the cover is at all loosened from its seat. And, moreover, the improved cover is adapted for application not only to new cars, but also to replace covers now in use.

What I claim is:

1. The combination with a tank body sheet having an opening, of a ring secured about said opening and provided with threads; a second ring having threads to match the threads of the first-mentioned ring, a flange and an edge to receive a cover, said second ring being removedly screwed to the first-mentioned ring; hinged threaded bolt shanks pivotally secured to one of said rings; a cover having slots in its edge to receive the said bolt shanks; and nuts upon the bolt shanks for forcing the cover into close frictional contact with the edge of the second mentioned ring.

2. The subject-matter of claim 1, when the first-mentioned ring has a plain surface against which the flange of the second-mentioned ring bears when said rings are screwed together.

3. The subject-matter of claim 1, when the first-mentioned ring has a plain surface and there is interposed between said surface and the flange of the second-mentioned ring a gasket forming a tight joint when said rings are united.

4. The combination with a tank body sheet having an opening, of a ring secured about said opening and provided at its edge with a seat to be engaged by a cover, hinged threaded bolt shanks pivotally secured to the said ring, a cover having slots at its edge to receive the said bolt shanks, nuts upon the bolt shanks for forcing the cover into close frictional contact with the edge of the ring, and means movable relative to the cover for guarding a plurality of the nuts upon the bolt shanks so they cannot be unscrewed until the said means is removed.

5. A cover for a tank car opening having a threaded hole with a threaded screw-plug therein and a passage through the plug, the top opening thereof being located below the top thread of the plug and the lower opening in communication with the interior of the tank, whereby when the plug is unscrewed the top opening to the passage is brought into communication with the atmosphere and a discharge vent provided for the escape of gas.

6. A cover for an opening in a tank car having a threaded hole therethrough, and a threaded plug adapted to fit the hole, the lower part of the plug being hollow and open to the interior of the tank car and the hole through the threaded part of the plug in communication with the interior of the plug, for the purpose set forth.

7. The combination with a tank body sheet having an opening, of a ring secured about said opening and provided at its edge with a seat for a removable cover, a cover detachably secured to the ring by bolts and nuts, a threaded hole in the cover, a threaded plug in said hole, and a nut guard device in connection with the plug and adapted to be raised and lowered along with the plug when it is screwed into and out of the hole in the cover.

8. The subject-matter of claim 7, when the said plug is provided with a collar and a nut, between which a part of the nut guard is located.

9. The subject-matter of claim 7, when the said plug is provided with a passage therethrough which opens communication between the interior of the tank car and the atmosphere only when the plug is partially unscrewed and when entirely unscrewed raises the guard above the nuts on the bolts.

10. The combination with a tank body sheet having an opening, of a casting provided with a flange and screw-threads, a ring having a seat for a cover and threads, said ring being screwed into said casting and the casting riveted to the tank body sheet through the flange and about the opening, and a detachable cover matching the seat on said ring.

11. The subject-matter of claim 10, when said ring is provided with a flange which engages the said casting.

12. The subject-matter of claim 10, when the cover is provided with a gasket which engages the top edge of the said ring and the cover is secured to said ring by bolts and nuts.

13. The combination with a tank car having an opening with a seat for a cover, the cover having a threaded hole, of a threaded plug, bolts and nuts detachably securing the cover in position, and a nut guard provided with arms having slots within which the nuts are located when the cover is in position, said guard being connected to the said plug.

14. The combination with a tank car cover secured in position by bolts and nuts, said cover having a central threaded hole, of a threaded plug fitting the hole, and a nut guard with a central opening loosely mounted upon the plug and adapted to be raised and lowered therewith.

In testimony whereof I affix my signature.

MYERS A. GARRETT.