Oct. 6, 1925. 1,556,001

J. J. McBRIDE

LOCK FOR TANK CAR SAFETY VALVES

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Fig. 1.

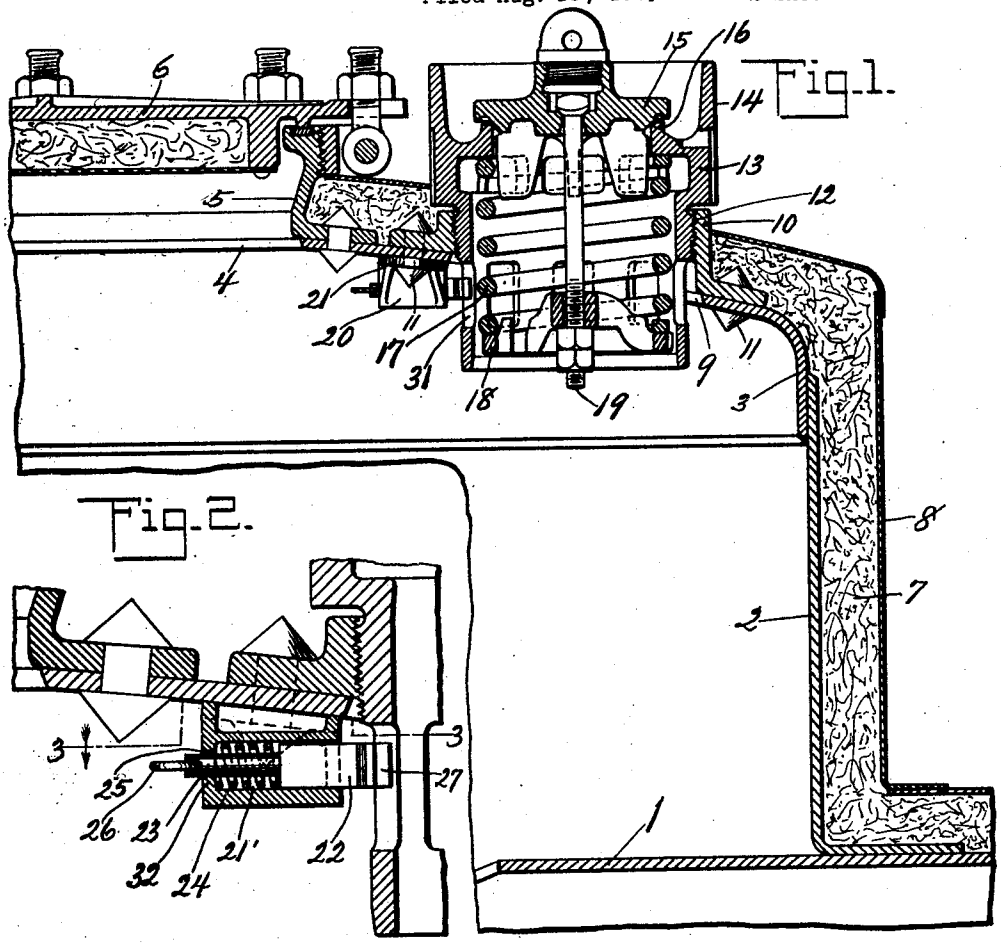

Fig. 2.

Fig. 3.

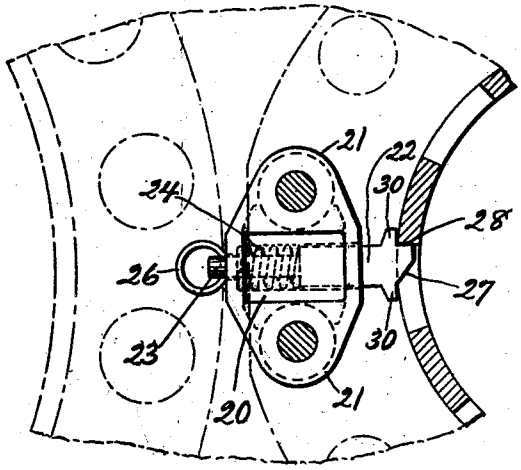

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Fig. 4.

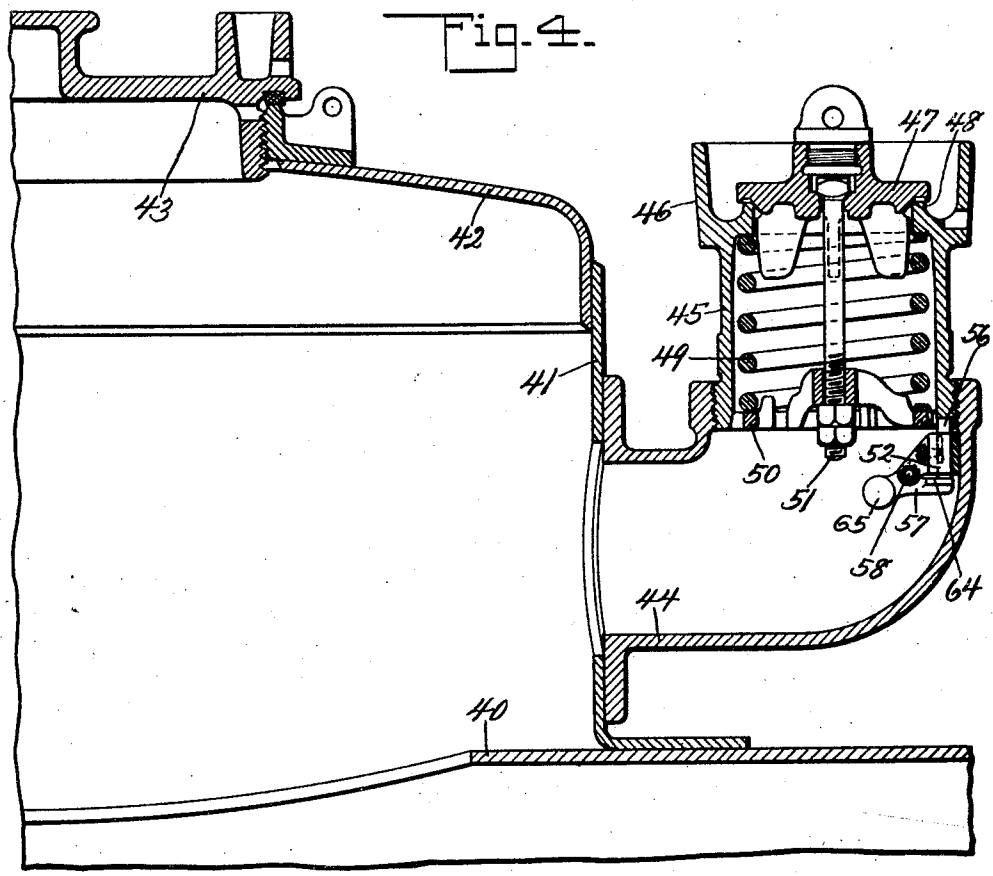


Fig. 5.

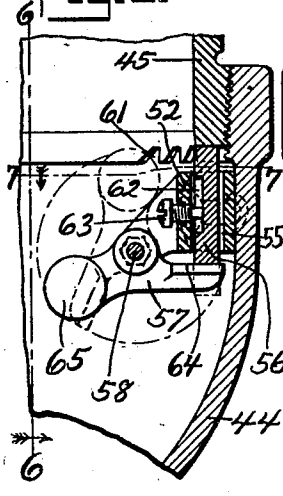


Fig. 6.

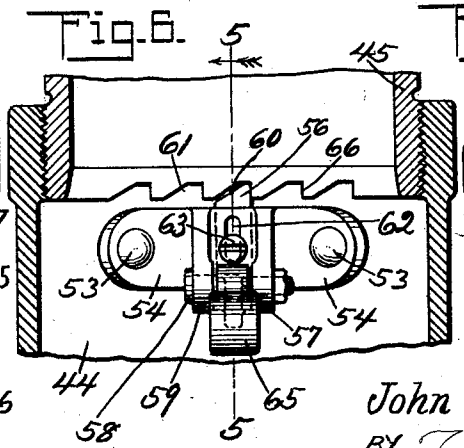
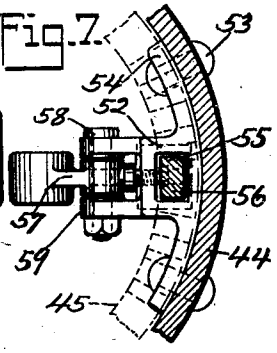


Fig. 7.



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Patented Oct. 6, 1925. 1,556,001

UNITED STATES PATENT OFFICE.

JOHN J. McBRIDE, OF BAYONNE, NEW JERSEY, ASSIGNOR TO AMERICAN CAR AND FOUNDRY COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

LOCK FOR TANK-CAR SAFETY VALVES.

Application filed August 16, 1923. Serial No. 657,752.

To all whom it may concern:

Be it known that I, JOHN J. McBRIDE, residing at the city of Bayonne, in the county of Hudson and State of New Jersey, and being a citizen of the United States, have invented certain new and useful Improvements in a Lock for Tank-Car Safety Valves, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and to use the same, reference being 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 said drawings:

Fig. 1 is a partial vertical section of a car tank dome having a safety valve provided with a locking means in accordance with this invention;

Fig. 2 is a vertical section of the locking means shown in Fig. 1, portions of the dome head and safety valve being shown;

Fig. 3 is a section taken on the line 3—3 of Fig. 2 showing the locking means in plan view;

Fig. 4 is a view similar to Fig. 1 showing a safety valve applied to a car tank dome in a different manner and showing a modified form of the safety valve locking means;

Fig. 5 is a section taken on line 5—5 of Fig. 6 and showing part of the locking means in elevation;

Fig. 6 is a section taken on the line 6—6 of Fig. 5 and

Fig. 7 is a section taken on the line 7—7 of Fig. 5.

It is an object of this invention to provide a means for locking the safety valves of car tanks in position in order to prevent their removal and the drawing off of the tank contents by unauthorized persons without breaking the seal on the tank closure and it is also an object of this invention to provide a locking means of such construction that it may be readily operated to permit of the removal of the safety valves upon removal of the manhole cover. It is also an object of this invention to provide a simple and efficient locking means that may be readily applied to the safety valves now used on car tanks.

In Figures 1, 2 and 3 the invention has been illustrated in connection with an insulated car tank 1 having a dome sheet 2 and dome head 3 provided with the usual manhole opening 4 surrounded by a dome ring 5 upon which a manhole closure 6 is secured in any usual or desired manner. the tank 1, dome sheet 2 and dome head 3 are covered by a layer of heat insulating material 7 protected by an outer sheathing 8. The dome head 3 is provided with a safety valve opening 9 surrounded by a flanged ring 10 secured to the dome head 3 by the rivets 11. The ring 10 is interiorly threaded as at 12 to receive the casing 13 of the safety valve 14. The safety valve 14 has an outlet valve 15 held to a seat 16 by means of a spring 17 in engagement with a follower 18 carried by the valve stem 19 in the usual manner. Secured to the dome head 3 by rivets 11 is a casing 20 having outwardly extended flanges 21 which bear against the dome head 3 and are provided with openings to receive the rivets 11. The casing 20 has a chamber 21′ in which is mounted a plunger 22, having a cylindrical extension or stem 23 surrounded by a spring 24 confined between the plunger 22 and the rear wall 32 of the chamber 21′. The stem 23 projects through an opening 25 in the chamber wall 32 and is provided with an opening in which is placed a ring 26 which limits the outward movement of the plunger 22 and prevents the spring 24 forcing the plunger 22 from the chamber 21′. The plunger 22 is provided at its outer end with an inclined surface 27, with a surface 28 parallel to the longitudinal axis of the plunger 22 and with laterally extending projections 30.

In safety valves of the type shown in Figures 1 to 3, the valve casing is usually provided with openings 31 on the portion of the casing which projects into the tank. Such openings can be readily made, however, in casings where they are not found. Upon the insertion of the valve in a tank equipped with the improved locking means, rotation of the valve in order to screw it into position in the ring 10 will cause the casing, at the openings 31, to engage with the inclined surface 27 of the plunger 22 and force

back the plunger as the valve casing is rotated, the spring 24 serving to force the plunger forward each time an opening 31 comes in position in front of the plunger and the ring 26 limiting the outward movement of the plunger so that the casing wall between the openings 31 will not engage the projection 30. With the valve screwed into position, any attempt to rotate the valve in the opposite direction in order to remove it from the tank will cause the casing 13 to engage with the surface 28 of the plunger 22 whereby further movement of the valve casing will be prevented. The surface 28 of the plunger 22 will be engaged with the casing 13 no matter whether the casing is stopped with the plunger 22 in engagement with an opening 31 or not, as the plunger will be forced forward into the first opening 31 brought in front of the plunger in rotating of the casing 13 to withdraw the safety valve 14 from the dome head 3. It will be noted, however, that upon removal of the manhole cover 6, the plunger 22 may be retracted by the operator grasping the ring 26 whereupon the safety valve 14 may be rotated to remove it from the dome head.

In the modification shown in Figures 4 to 7, a tank 40 comprising a dome sheet 41 and a dome head 42 having the usual manhole opening closed by a cover 43 is provided with an outlet 44 secured to the dome sheet 41 as by rivets (not shown). The outlet 44 is interiorly threaded at its outer end and has the casing 45 of the safety valve 46 mounted therein. The safety valve 46 is provided with the outlet valve 47 held to its seat 48 by a spring 49 which bears against the follower 50 carried by the stem 51 in the usual manner. To the outlet 44 there is riveted a casing 52 by means of rivets 53 passing through flanges 54 formed integral with the casing 52. The casing 52 is provided with a chamber 55 in which there is mounted a plunger 56 adapted to be forced upwardly by a weighted lever 57 pivotally mounted on a pin 58 carried by lugs 59 formed integral with the casing 52. The plunger 56 is provided with an inclined surface 60 at its upper end and is adapted to engage in correspondingly shaped notches 61 formed in the bottom edge of the valve casing 45. The plunger 56 is grooved as at 62 to receive a pin 63 which limits the movement of the plunger 56 in the casing 52 and which keeps the plunger 56 from falling from the casing when the operating lever 57 is disengaged from the plunger 56. The operating lever 57 is provided at one end with a flat engaging surface 64 to engage the bottom of the plunger 56 and has its other end weighted as at 65 to cause the lever 57 to normally press the plunger 56 upwardly.

In the construction shown in Figures 4 to 7, when the valve casing is rotated to screw the valve into the outlet 44, the inclined surfaces of the notches 61 will engage with the inclined surface 60 of the plunger 56, forcing the plunger downwardly against the action of the lever 57. This will permit of the casing being screwed into the outlet 44. When an attempt is made to rotate the casing 45 in the opposite direction in order to remove the safety valve 46 from the outlet 44, the weighted lever 57 will force the plunger 56 into a notch 61 in the casing 45 and the flat surface 66 of the notch will engage with the side of the plunger 56 and prevent rotation of the casing 45. It will be noted that in this construction, upon removal of the manhole cover 43 the weighted lever may be manually shifted to the position shown in dotted lines in Figure 5 whereupon the plunger 56 will drop and the casing 45 may be rotated to withdraw the safety valve 46 from the outlet 44. In the construction shown in Figures 4 to 7 the outlet 44 is considered to be but an extension of the tank dome and the expression "within the tank" is to be understood as applying equally well to the locking means shown in Figures 4 to 7 as to the locking means shown in Figures 1 to 3.

What is claimed is:

1. The combination of a car tank dome having a manhole and an outlet for fluid under pressure to one side of the manhole, a safety valve secured in the fluid outlet, means for locking the safety valve in place engaging the inner end portion of the safety valve and normally preventing removal of the safety valve, said locking means being disposed entirely beyond the periphery of the manhole but accessible for releasing through the manhole.

2. The combination of a car tank dome having a manhole and an outlet for fluid under pressure to one side of the manhole, a safety valve screwed into the fluid outlet, a lock for said safety valve positioned entirely to one side of said manhole and engageable with the inner end portion of the safety valve to prevent unscrewing of the safety valve when in operative engagement therewith, said lock being accessible through the manhole for movement out of locking engagement with the safety valve.

3. The combination of a car tank dome having a manhole and an outlet for fluid under pressure to one side of the manhole, a safety valve fitting in the fluid outlet, and means for locking the safety valve against unauthorized removal positioned entirely beyond the periphery of the manhole and engageable with the inner end portion of the safety valve to lock the safety valve in place.

4. The combination of a car tank dome having a manhole, a cover for the manhole,

a safety valve carried by the tank dome to one side of the manhole, and automatically operating locking means within the tank adapted to prevent removal of said safety valve, said locking means being disposed entirely beyond the periphery of the manhole but accessible through the manhole to permit removal of the safety valve upon removal of the manhole cover.

5. The combination of a car tank dome having a manhole, a cover for the manhole, a safety valve carried by the tank dome, and locking means for the safety valve disposed within the dome for engaging the inner end portion of the safety valve, said locking means being disposed entirely out of alinement with the manhole opening but accessible through the manhole opening when the manhole cover is removed for adjustment to permit removal of the safety valve.

In witness whereof I have hereunto set my hand.

JOHN J. McBRIDE.