Feb. 10, 1959 C. H. FOLMSBEE 2,873,043

COVER ASSEMBLY FOR TANKS

Filed March 16, 1956

Fig. 1

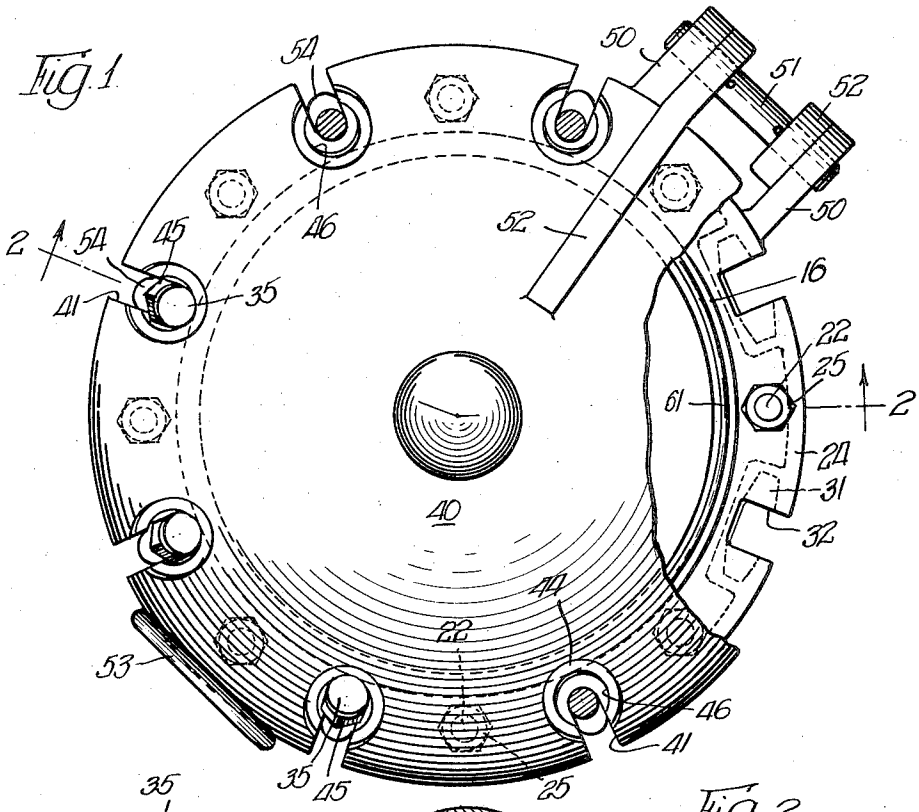


Fig. 2

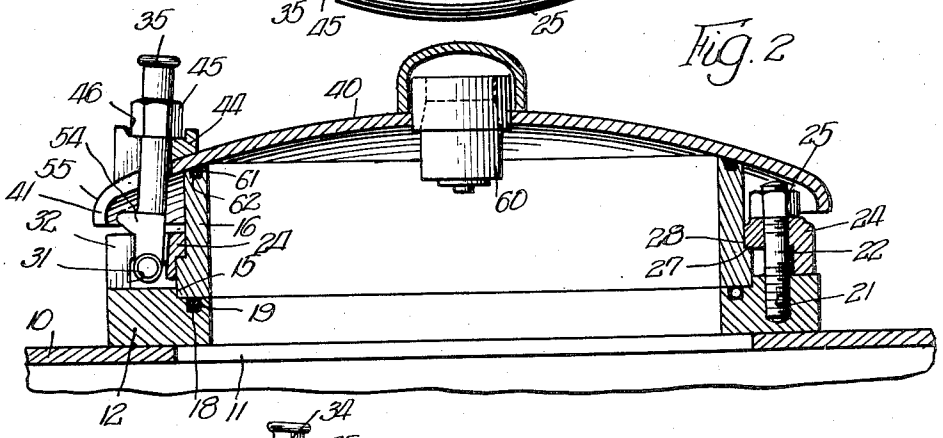
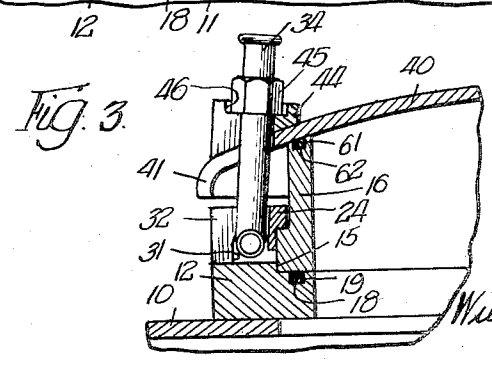


Fig. 3



INVENTOR.

Clyde H. Folmsbee,

BY

Wilkinson Huxley, Byron & Hume

Attys

United States Patent Office 2,873,043 Patented Feb. 10, 1959

2,873,043

COVER ASSEMBLY FOR TANKS

Clyde H. Folmsbee, Charlevoix, Mich., assignor to Union Tank Car Company, Chicago, Ill., a corporation of New Jersey

Application March 16, 1956, Serial No. 572,031

6 Claims. (Cl. 220—55)

This invention relates, as indicated, to a cover assembly for tanks, and more particularly to a cover assembly for a manway in railway tank cars and the like.

It is frequently necessary to replace the entire cover assembly in a tank for different commodities. For example, in some instances it is required that the cover assembly be of strong structural materials. If the tank is to be pressurized, a more effective seal is desirable.

It is, therefore, an object of the invention to provide a cover assembly which is readily removable and made up of easily replaceable elements.

It is a further object of the invention to provide a cover assembly for tanks in which the cover cannot be removed until the seal is broken.

Further objects and advantages of this invention will become evident as the description proceeds and from an examination of the accompanying drawing which illustrates one embodiment of the invention and in which similar numerals refer to similar parts throughout the several views.

In the drawing:

Figure 1 is a top plan view of a device embodying the invention.

Figure 2 is a view in cross section, taken substantially along line 2—2 of Figure 1.

Figure 3 is a fragmentary view in cross section of the cover assembly as shown in Figure 2, except with another form of bolt used for holding the cover.

As shown in the drawing, a suitable opening **11** is formed in the upper wall of the tank **10**. A supporting base ring **12** is integrally secured to the tank around the periphery of the opening **11**, as by welding. The base **12** is provided with a shoulder **15** along its interior upper edge in which a manway ring **16** in the form of a sealing member is seated. The sealing ring may be of metal or any other material of proper strength. A suitable annular groove **18** may be provided adjacent the inner surface of the base **12** to receive an O-ring **19** which serves to form a seal between the ring **16** and the base **12**.

A plurality of threaded bores **21** are provided in the base **12** adapted to threadedly receive the studs **22**. A retainer collar **24** is adapted to be disposed on top of the base **12** and removably held in engagement therewith by the studs **22** and the hex nuts **25** which can be threaded on the upper end of the studs **22**.

The retainer collar **24** is provided with a shoulder **28** on its inner periphery adapted to co-operate with a shoulder **27** formed at the base of the ring **16** to retain the ring **16** in abutment with the upper edge of the base **12** as previously described. As best shown in Figure 2, the retainer collar **24** is provided with a plurality of recesses **31** in its bottom around the periphery thereof. Slotted openings **32** in the outer and upper periphery of the retainer collar communicate with said recesses. T-bolts **34, 35** extend from the retainer collar through these slotted openings. The recesses in the retainer collar bottom are adapted to receive the transverse portion of the T-bolts **34, 35**. These bolts are inserted in the

retainer ring **24** prior to its being secured to the supporting base **12** and are, therefore, likewise held in operative position by the retainer ring **24** and the studs and hex nuts **25**. Because of this construction, the T-bolts can be pivoted outwardly on their T-base toward or away from the center of the circle encompassed by the retainer collar. Also, the construction permits easy removal and replacement of the bolts.

A cover member **40** is provided which has a plurality of slots **41** in its outer periphery corresponding with the slots in the retaining ring **24** which are adapted to receive the upper ends of the T-bolts **34, 35**. A boss **44** is provided at the inner extremity of each of the slots **41** in the cover **40** having a recess **46** which forms a seat for the hex nuts **45** on the ends of the T-bolts **34, 35** after they have been pivoted upwardly into locking association with the cover **40**.

The cover **40** is pivotally secured to the two flanges **50** by the pin **51**, the pin being carried by the arms **52**. With all of the T-bolts pivoted out of the slots in the cover **40**, the cover may be lifted by handle **53**, so that it pivots about the pin **51** into an open position.

In addition to the T-bolts **34**, as shown in Figure 3, there are two retaining bolts **35** having a slightly different configuration. As best shown in Figure 2, these bolts **35** have a protruding boss or shoulder **54** provided adjacent the base thereof. This boss **54** is of sufficient width that it will not pass through the slot **41** in which the T-bolt **35** is normally received. This means that even though the hex nut **45** is loosened to some degree it will not permit the bolt **35** to pivot out of the slot **41** until the cover **40** has been lifted sufficiently to permit the boss **54** to clear the downwardly projecting flange **55** on the cover **40**. Thus, any seal previously formed between the cover **40** and the ring **16** will necessarily have been broken before the cover **40** is free to move away from the ring **16**.

A relief valve **60** is also provided at the center of the cover **40** which valve is designed to open to the atmosphere if the pressure within the tank falls below atmospheric pressure.

At the upper edge of ring **16** may be provided a groove **61** adapted to receive an O-ring **62** to provide a seal with the cover member **40** when the latter is in engagement therewith.

In view of the foregoing, it should be apparent that in the structure disclosed herein the entire cover assembly may be replaced by one of a difference type. Alternatively, any element in the assembly may be substituted by another. This flexibility is important if the tank is to contain different commodities. For example, ring **16** can be removed and a different type of seal can be substituted in the event a pressurized tank is required. This is done by loosening retainer ring **24** so that the ring **16** can be lifted out of association with the base **12** and a ring of different structural characteristics substituted therefor. Likewise, a different type of cover may also be substituted at the same time.

In the drawing and specification, there has been set forth a preferred embodiment of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation. Changes in form and in the proportion of parts, as well as the substitution of equivalents are contemplated, as circumstances may suggest or render expedient, without departing from the spirit or scope of this invention as further defined in the following claims.

I claim:

1. A cover assembly for a tank comprising a base member secured around an opening in a tank, said base the inner periphery thereof, an upwardly facing base

member groove in said shoulder, a sealing member in said base member groove, a sealing ring member with a groove on the upper end seated on said shoulder of said base member, a sealing member in said sealing ring member groove, said sealing ring member having a shoulder formed on the outer periphery thereof adjacent its lower end, an annular retainer member removably fastened to said base member engaging said shoulder on said sealing ring member for holding said sealing ring member on said base member, a cover member over said sealing ring member, and means pivoted on said retainer member securing said cover member against said sealing member on said sealing ring member.

2. A cover assembly for a tank comprising a base member secured around an opening in a tank, said base member having an upwardly facing shoulder formed on the inner periphery thereof, a sealing ring member with a groove on the upper end thereof seated on said shoulder of said base member, a sealing member in said groove, said sealing ring member having a shoulder formed on the outer periphery thereof, an annular retainer member removably fastened to said base member engaging said shoulder on said sealing ring member for holding said sealing ring member on said base member, a cover member over said sealing ring member, and means pivoted on said retainer member securing said cover member against said sealing member on sealing ring member

3. A cover assembly for a tank comprising a base member secured around an opening in a tank, said base member having an upwardly facing shoulder formed on the inner periphery thereof, a metal sealing ring member with groove on the upper end seated on said shoulder of said base member, a sealing member in said groove, said sealing ring member having a shoulder formed on the outer periphery thereof, an annular retainer member removably fastened to said base member engaging said shoulder on said sealing ring member for holding said sealing ring member on said base member, a cover member over said sealing ring member, and means pivoted on said retainer member securing said cover member against said sealing member on sealing ring member.

4. A cover assembly for a tank comprising a base member with an upwardly facing shoulder secured around an opening in a tank, a metal sealing ring member with a groove on the upper end seated on said shoulder of said base member, a horizontally extending shoulder on the outer portion of said sealing ring member, a sealing member in said groove, an annular retainer member removably fastened to said base member engaging said shoulder on said sealing ring member for holding said sealing ring member on said base member, a cover member over said sealing ring member, and means pivoted on said retainer member securing said cover member against said sealing member on said sealing ring member.

5. A cover assembly for a tank comprising a base member secured around an opening in a tank, said base member having an upwardly facing shoulder formed on the inner periphery thereof, a metal sealing ring member with gasket groove on upper end seated on said shoulder on said base member, an annular retainer member removably fastened to said base member engaging said sealing ring member for holding said sealing ring member on said base member, a cover member over said sealing ring member, sealing members operatively associated with said sealing ring member engaging said base member and said cover member, and means pivoted on said retainer member securing said cover member against the upper sealing member associated with said sealing ring member.

6. A cover assembly for a tank comprising a base member secured around an opening in a tank, said base member having an upwardly facing shoulder formed on the inner periphery thereof, a metal sealing ring member seated on said shoulder of said base member, said sealing ring member having a shoulder formed on the outer periphery thereof, an annular retainer member removably fastened to said base member engaging said shoulder on said sealing ring member and holding said sealing ring member on said base member, a cover member over said sealing ring member, sealing members operatively associated with said sealing ring member engaging said base member and said cover member, and means pivoted on said retainer member securing said cover member against the upper sealing member associated with said sealing ring member.

References Cited in the file of this patent

UNITED STATES PATENTS

97,879	Cattell	Dec. 14, 1869
1,036,378	Thurman	Aug. 20, 1912
1,744,119	Hull	Jan. 21, 1930
1,894,679	Folmsbee	Jan. 17, 1933
1,990,189	King	Feb. 5, 1935
2,517,372	Ambrose	Aug. 1, 1950

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 2,873,043

Clyde H. Folmsbee

February 10, 1959

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 2, line 70, after "said base" insert — member having an upwardly facing shoulder formed on —; column 4, line 13, for "on said" read — of said —.

Signed and sealed this 30th day of June 1959.

(SEAL)
Attest:

ARL H. AXLINE

Attesting Officer

ROBERT C. WATSON
Commissioner of Patents