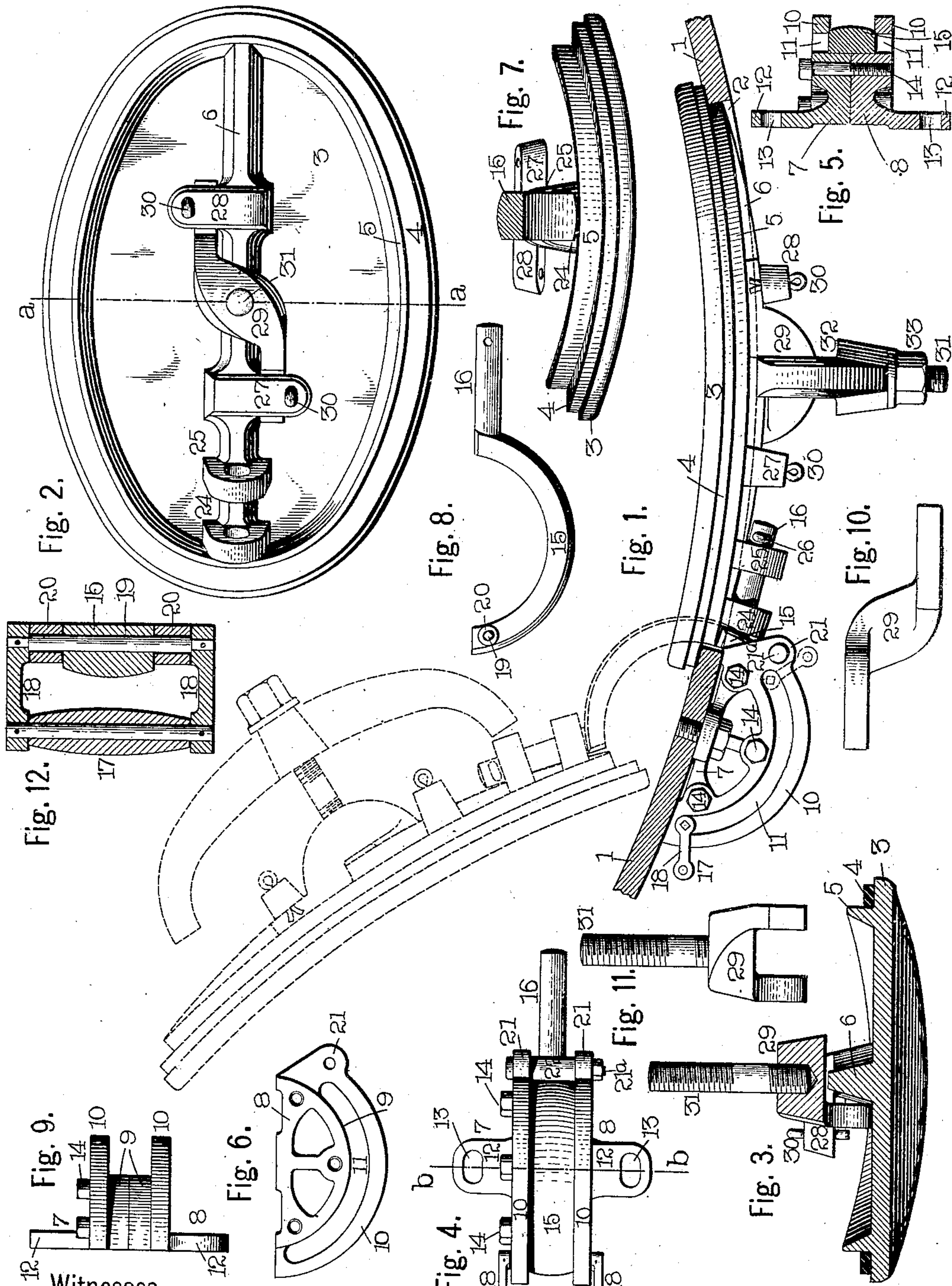


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PATENTED NOV. 6, 1906.

W. YAEGER.
MANHOLE COVER.
APPLICATION FILED DEC. 4, 1905.



Witnesses.

L. M. Sangster.
Geo. A. Neubauer.

By

Inventor.
William Yaeger.
A. J. Sangster Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM YAEGER, OF BUFFALO, NEW YORK.

MANHOLE-COVER.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM YAEGER, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a certain new and useful Improvement in Manhole-Covers, of which the following is a specification.

This invention relates to a cover or door for manholes in tanks, vats, and similar vessels.

Among the objects of the invention are to provide means whereby the cover or door may be opened to completely expose the manhole, to arrange the mechanism for fastening the cover in closed position, so that it may adjust itself to equalize the locking strain, and to afford means for adjustment for the slidable connection whereby the various parts may be properly adjusted to bring the cover in exact position with respect to the manhole.

The invention also relates to certain details of construction, all of which will be fully and clearly hereinafter described and claimed, reference being had to the accompanying drawings, in which a preferred adaptation of the invention is shown.

In the drawings, Figure 1 is a horizontal section through a fragment of a tank, showing a top plan view of my improved manhole cover or door in full lines in closed position and in open position in dotted lines. Fig. 2 is a detached front elevation of the improved cover. Fig. 3 is a transverse section through the cover on line *a a*, Fig. 2. Fig. 4 is a detached front elevation of the slidable connecting mechanism. Fig. 5 is a central vertical section on line *b b*, Fig. 4. Fig. 6 is a detached top plan view of the lower half of the stationary member of the connecting mechanism. Fig. 7 is a detached edge view of the cover, showing the slidable member of the connecting mechanism in position thereon, a transverse section being taken through the slidable member. Fig. 8 is a detached plan view of the slidable member. Fig. 9 is a detached end elevation of the stationary member. Fig. 10 is a detached bottom view of the yoke. Fig. 11 is a detached end view of the yoke. Fig. 12 is an enlarged transverse section through the handle which operates the cover, showing the method of supporting it from the slidable member.

This invention is adapted to be utilized in connection with both metal, wooden, and analogous tanks and other vessels and is ar-

ranged so that all portions of the slidable connecting mechanism and the fastening mechanism are on the exterior of the tank or other vessel when the cover is closed.

In referring to the drawings for the details of construction like numerals designate like parts.

A fragment of a tank or vessel 1 is shown in the drawings and has a manhole 2, which is preferably of an oval form and just about large enough to permit the passage of a man.

The cover or door 3 is preferably of a similar oval form and slightly larger than the manhole and is provided with a packing 4 upon one side of its outer margin, which is adapted to contact with the tank-surface adjacent to and surrounding the manhole to hermetically seal the manhole-opening when the cover is closed.

The cover is preferably provided with a marginal flange 5, which projects laterally outward from its exterior surface to strengthen the construction, and the inner surface of its surrounding margin may be recessed to provide an oval seat for the packing 4.

A longitudinally-extending rib 6 is likewise formed on the exterior of the cover.

The cover is supported from the tank by connecting mechanism which in part slides, so that the cover may be opened or closed. This connecting mechanism comprises a stationary element attached to the tank and a slidable element attached to the cover and slidably supported by the stationary element. The stationary element is preferably constructed in two half portions or blocks 7 and 8, each of which has a curved outer surface 9, a curved flange 10, projecting outwardly from one side of the block and provided with a curved slot 11, the inner wall of which curves in alinement with the curved surface 9, and a base-lug 12, having a curved slot 13, through which a screw-bolt, rivet, or other fastening may be fitted to secure the block to the tank. The two half portions or blocks 7 and 8 are fastened together by bolts or rivets 14, with their curved surfaces 9 extending in alinement and the slotted flanges 10 on opposite sides of the combined curved surfaces. The slidable member consists of a semicircular or curved metal strip 15, which curves in correspondence with the curve of the surface 9 and upon which it is slidably mounted, and a rod or bar 16, which is loosely secured to the cover.

The rod or bar 16 extends from one end of

the strip, and a handle 17 is arranged at the opposite end of the strip, which serves the double function of providing a convenient means for opening and closing the cover or
 5 door and also limiting the opening movement to prevent any portion of the cover coming in contact and touching the interior surface of the tank, chipping the enamel, should the interior of the tank be enameled, or otherwise
 10 injuring the same.

The handle 17 is connected by arms 18 to the opposite ends of a pin 19, which extends vertically through the outer end of the curved strip outwardly through the curved
 15 slots 11, and rollers 20 are loosely mounted on the pins 19, which roll in the curved slots 11.

The blocks 7 and 8 are provided at what I term the "inner" end, or that end nearest
 20 the cover, with outwardly-projecting enlargements or lugs through which a bolt 21 or the like is passed. The bolt 21 serves a twofold purpose, as it fastens the two blocks 7 and 8 together at that end and also forms a
 25 support for a roller 22, which rolls against the top surface of the curved strip 15 and in conjunction with the rollers 20 supports the strip, so that its slidable movement will be smooth and easy.

30 It will be noted that the outer surface of the strip 15 is rounded or curved in cross-section, as shown at 23, which naturally aids the easy movement by obviating any tendency to binding.

35 The bar or rod 16 is loosely fastened to the cover to permit sufficient play to allow the cover to be drawn exactly and tightly into place to close the manhole.

The cover is provided with two lugs 24 and
 40 25, each of which has an opening slightly larger in diameter than the rod 16, through which said rod is passed, and a pin 26 is fitted laterally in the projecting end of the rod to lock it against withdrawal from the
 45 openings in the lugs.

The bar or rod 16 has but a slight turning movement, being prevented from rotating very much by the contacting of the end of the strip 15 with the surface of the cover. This
 50 prevents the cover from turning materially on the bar 16 when open, while affording sufficient play to perfectly fit the cover tightly in proper position in the manhole.

The cover is fastened in place by mechanism which is loosely attached thereto, so that it may automatically adjust itself to compensate for any irregularities in the fitting of the cover, and thereby force all portions of its marginal edge with equal and
 60 uniform pressure against the marginal surface or wall of the manhole.

Two lugs 27 and 28 project laterally and oppositely to each other from different points of the rib 6, and a yoke 29 of angular
 65 form has its opposite ends placed under the

lugs 27 and 28 and held loosely therein by cotter-pins 30, fitted through vertical openings in the outer extremities of the lugs into contact with the surface of the cover. A vertical screw-threaded bar 31 extends up-
 70 ward from the center of the yoke, and a curved bridge-bar 32 has a central opening through which the bar 31 passes. The opposite ends of the bridge-bar are adapted to bear against the outer surface of the tank to
 75 bring the cover into tight fit, and a screw-nut 33 is fitted upon the screw-bar above the bridge-bar for the purpose of forcing the bridge-bar ends against the tank side, and thereby securing the cover in hermetically-
 80 sealed position in the manhole.

The purpose of the curved slot 13^a in the base-lug 12 is to provide for adjustment of the slidable connecting mechanism to enable the cover to be correctly alined with the man-
 85 hole.

The cover is attached to the tank after the manhole is cut by fastening the stationary member of the connecting mechanism to a suitable portion of the tank and the slidable
 90 member to the cover.

The cover is conveniently opened and closed by grasping the handle 17 and is locked in position by turning the bridge-bar 32 so that its ends project over the marginal
 95 surface of the manhole and then tightening the screw-nut 33.

To open the cover, the screw-nut 33 is unscrewed, the bridge-bar turned to bring its ends out of engagement with the tank-sur-
 100 face, and the handle 17 grasped and moved to slide the curved strip 15 on the curved surface 9 and turn the cover inward.

The principal advantages reside in the great strength of structure of the connecting
 105 mechanism, the arrangement of the mechanism on the exterior of the cover and tank, the limiting of the inward movement of the cover by an exterior stop, whereby the cover may be swung open to completely free the man-
 110 hole without contacting with the interior of the tank at any point, the loose connection of the slidable member and the yoke to the cover to provide for adjustment of the cover with respect to the manhole and adjustment
 115 of the fastening mechanism upon the cover to compensate for any irregularity, and in the convenient handle whereby the cover may be moved in either direction without inserting a hand within the tank.
 120

I claim as my invention—

1. A device of the class described, having a manhole, a cover adapted to close said manhole and mechanism connecting said cover to the device and including one ele-
 125 ment fastened to the exterior of the device and another element fastened to the cover and slidably supported by the first-mentioned element to permit the opening and closing of said cover.
 130

2. A device of the class described, having a manhole, a cover adapted to close said manhole, and a curved slidable connection between said cover and the device and including an element secured to exterior of the device and an element secured to exterior of the cover and slidably attached to the first-mentioned element.

3. A device of the class described having a manhole, a cover adapted to close said manhole and mechanism connecting said cover to the device and including an element secured to the exterior of device and having a curved slideway-surface, and an element secured to the exterior of one end of the cover and having a surface correspondingly curved and slidably mounted upon the surface of the first-mentioned element.

4. A device of the class described having a manhole, a cover adapted to close said manhole, and mechanism movably connecting said cover to said device including a stationary element attached to the device and having a slide-surface and slotted side flanges, and a slidable element attached to the cover and having a part slidably mounted upon the slide-surface of the stationary element and pins projecting through the slots.

5. A device of the class described having a manhole, a cover adapted to close said manhole, and mechanism movably connecting said cover to said device including a stationary element attached to the device and having a slide-surface and slotted side flanges, a slidable element attached to the cover and having a part slidably mounted upon the slide-surface of the stationary element, pins projecting through the slots, and an operating-handle supported from the pins.

6. A device of the class described, having a manhole, a cover adapted to close said manhole, mechanism movably connecting the cover to the device and mechanism for locking the cover in closed position including a yoke loosely attached to the cover and having an outwardly-extending screw-bar, a bridge-bar on the screw-bar with its ends extending over the marginal edge of the manhole and a screw-nut fitted upon the screw-bar over the

bridge-bar, whereby the yoke will turn and compensate for any inequality when the cover is drawn into tight closed position by the bridge-bar and also equalize the pressure of the screw-bar.

7. A device of the class described, having a manhole, a cover adapted to close said manhole, mechanism movably connecting the cover to the device and mechanism independent of the connecting mechanism for locking the cover in closed position loosely attached to said cover.

8. A device of the class described having a manhole, a cover adapted to close said manhole and having a rib and oppositely-extending lugs, a yoke straddling the rib and having its ends loosely secured below the lugs and provided with a screw-bar, a bridge-bar on the screw-bar and a screw-nut fitted upon the screw-bar over the bridge-bar.

9. A device of the class described, having a manhole, a cover adapted to close said manhole, and mechanism connecting said cover to the device including a curved slidable portion loosely connected to the cover and an exterior curved slideway at one side of the manhole on which the curved slidable portion is supported and adapted to slide.

10. A device of the class described, having a manhole, a cover adapted to close said manhole, and having at least one eye-lug, and mechanism connecting the cover to the device having a slidable portion provided with a bar loosely fitted through the eye of the lug on the cover.

11. A device of the class described, having a manhole, a cover adapted to close said manhole and having at least one eye-lug, and mechanism connecting the cover to the device having a stationary element secured to the device and a slidable element slidably supported by the stationary element and having a part loosely fitted through the eye of the lug on the cover.

WILLIAM YAEGER.

Witnesses:

L. M. SANGSTER,
GEO. A. NEUBAUER.