June 27, 1933. A. T. DUDLEY 1,916,158

BOTTOM MANWAY COVER FOR OIL CRACKING STILLS

Filed Aug. 2, 1929

FIG. 2.

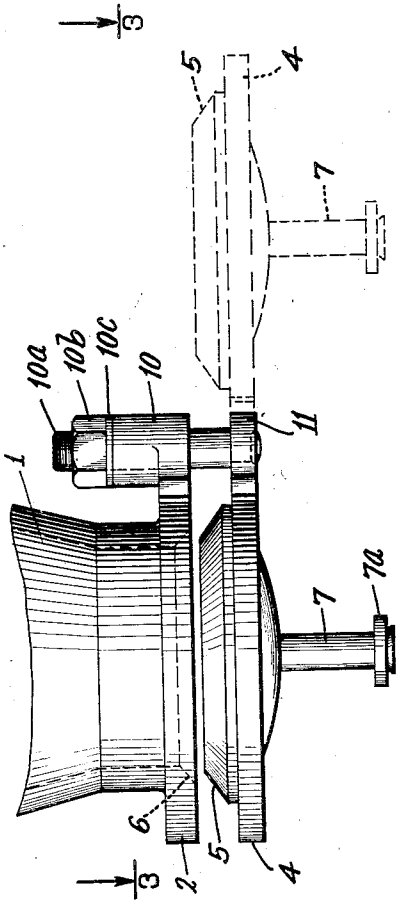


FIG. 3.

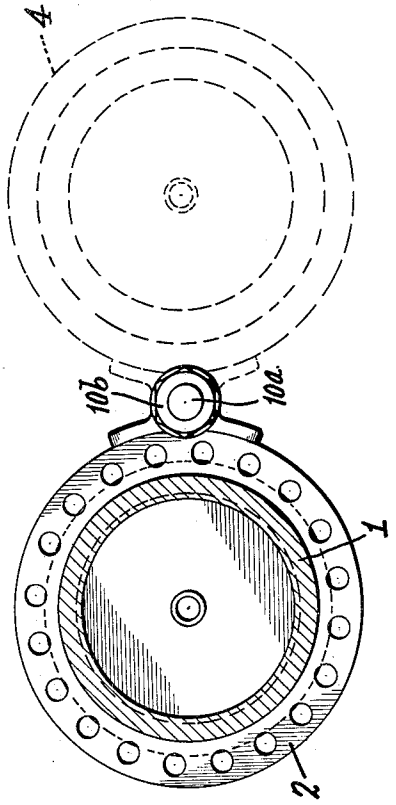


FIG. 4.

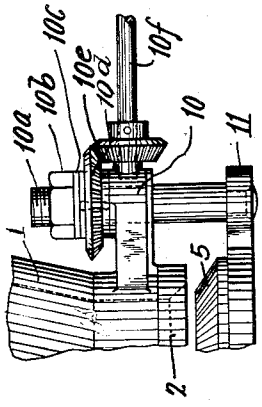
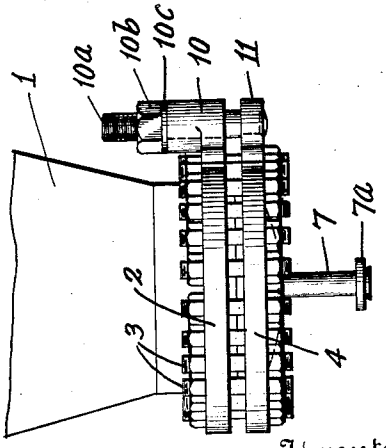


FIG. 1.



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By his Attorney
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UNITED STATES PATENT OFFICE

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BOTTOM MANWAY COVER FOR OIL CRACKING STILLS

Application filed August 2, 1929. Serial No. 383,003.

The present invention relates to closures for bottom manways in vertical vessels and has for its object to provide a bottom manway cover which is suitable to effectively and safely close the large bottom opening of a vertical pressure still such as is employed in the pyrolitic cracking of oil and which is so mounted as to permit its ready opening and closing in spite of its great weight and the serve conditions under which it is employed.

In operations where elevated vessels of heavy construction, having appropriately heavy covers for the openings, are employed it is extremely difficult and awkward to handle such covers manually when removing or replacing them as occasion demands. Chain and other forms of rigging intended to facilitate the handling of these heavy covers have been used from time to time but they have been slow and the covers have usually been hinged at one side and arranged to drop downwardly thus requiring more than one man or a chain hoist to swing them back into place.

The present invention is so effective that it not only overcomes all of the objections offered to former handling arrangements but in addition reduces labor requirements to a minimum.

These and other objects of my invention may may be better understood from the following description and the accompanying drawing of a preferred embodiment of the invention in which:

Fig. 1 is a view in elevation of an apparatus constructed in accordance with the invention and constituting an embodiment thereof.

Fig. 2 is a view in elevation of the invention also constructed in accordance with the invention and constituting an embodiment thereof.

Fig. 3 is a view taken on the line 3—3 of Fig. 2.

Fig. 4 is a fragmentary view in elevation of the invention showing gears for swinging the cover.

Referring now to the drawing a vertical cylindrical vessel 1, capable of withstanding considerable pressure, is provided with a manway opening at the bottom having a flange member 2 drilled to receive an appropriate number of bolts 3 which serve to secure an appropriate manway cover 4 thereto.

The manway cover 4 is preferably provided with a ground gasket portion 5 having a tapered or spherical face which fits evenly against seat 6 in the bottom of the vessel 1. A drain line 7 is secured into the manway cover having a slidable flange 7*a* for securement to a companion flange (not shown) on a drawoff line (not shown).

A lug 10, integral with or secured to the edge of flange 2, is bored to loosely hold a threaded pin 10*a* having a nut 10*b* and a washer 10*c*. The lower end of the pin 10*a* is rigidly secured to a lug 11 which is provided integral with or secured to the edge of manway cover 4.

A geared arrangement is shown in Fig. 4 for swinging covers which may be too heavy for one or two men to handle. Here the parts are similar to those shown in Fig. 2 except that the pin 10*a* is slightly longer and a bevel gear 10*d* is non-rotatably but slidably mounted on the pin 10*a*. A companion bevel gear 10*e* rigidly mounted on a shaft 10*f*, which may be rotated either mechanically or manually, serves to rotate the gear 10*d* to swing the cover around.

In operation one set of nuts are removed from stud bolts 3 and the manway cover 4 and the gasket 5 is unseated by rotating the nut 10*b*, which rests upon the washer 10*c* and the lug 10. The actual amount of movement required in unseating the cover is governed by the thickness of the flange 2, i. e. it must be enough so that the gasket 5 will be slightly below the bottom of the flange 2. Fig. 2 and Fig. 4 illustrate the manway cover unseated and resting upon the lug 10. The cover 4 and the gasket 5 supported by the pin 10*a* and nut 10*b* now resting upon the lug 10 may be swung around, manually or mechanically, to uncover the manway opening as illustrated by the dotted lines in Fig. 2 and Fig. 3.

Obviously the invention may be given other forms than those illustrated and described without limiting its spirit and scope therefore it is desired that it be limited only by the appended claims.

I claim:

1. The combination of a pressure still having a bottom manway with an eccentric pivotal support capable of a limited vertical axial adjustment, a manway cover having a ground gasket portion adapted to extend a short distance into the manway cover when closed and a multiplicity of removable fastenings in circular spaced relation for securing the cover in place, the arrangement being such that the manway cover by its own weight can be lowered to open the manway by the limited axial adjustment of the eccentric pivotal support sufficiently to permit the cover to be easily swung in its plane in either direction to uncover the manway opening without lowering it beyond the distance necessary to clear the gasket.

2. The combination of a pressure still having a bottom manway, a cover having a conical gasket portion adapted to tightly close said manway, a row of removable fastenings disposed in circular spaced relation for tightly securing the cover to the still when the manway is closed, a swiveled support disposed outside the row of fastenings capable of limited vertical axial adjustment to open the cover by its own weight, after disengagement by the fastenings, sufficiently to permit the cover to easily swing in its plane in either direction to uncover the manway opening without lowering it beyond the distance necessary to clear the gasket and to support the cover in a seating position for engagement by said fastenings.

3. The combination of a pressure still having a bottom manway with a beveled seat, a cover containing a gasket portion adapted to fit tightly in said seat to close the manway, removable fastenings for securing the cover to the still when seated, an eccentric pivotal support capable of a limited vertical axial adjustment arranged to detach the cover by its own weight when loosened and to raise the cover in seating position when tightened, and a geared mechanism for mechanically operating the pivotal support to rotate the cover in its plane to uncover the manway opening when said cover is disengaged by the fastenings and in a lowered position by said axial adjustment.

4. The combination of a pressure still having a bottom manway, a cover having a conical gasket portion adapted to tightly close said manway, a row of removable fastenings disposed in circular spaced relation for tightly securing the cover to the still when the manway is closed, a single vertical pin disposed outside the row of fastenings and carried by a portion of the still for supporting the weight of the cover and permitting pivotal movement thereof in its own plane after the fastenings are removed, and means associated with said pin to adjust the supporting position of the pin and the position of the cover.

In witness whereof I have hereunto set my hand this 23rd day of July, 1929.

ANDREW T. DUDLEY.