Aug. 6, 1929. W. S. MONTGOMERY 1,723,197

ADJUSTABLE OIL OUTLET

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Fig. 1.

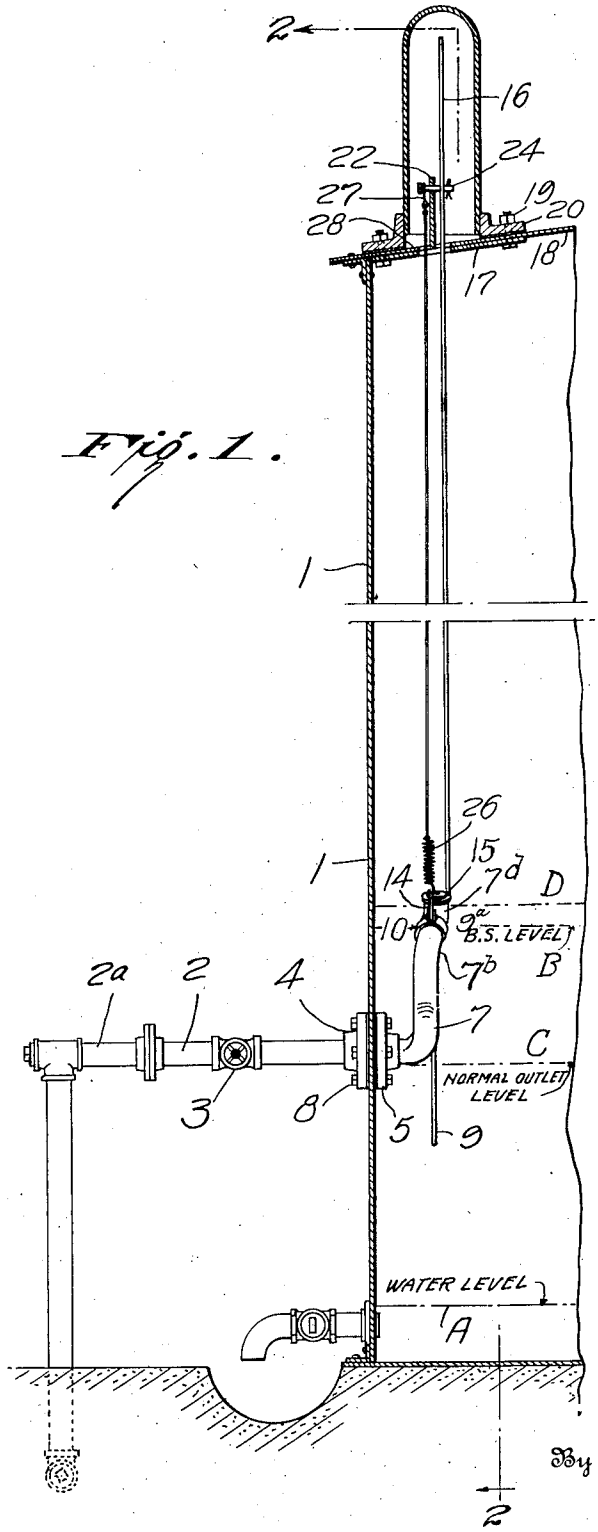
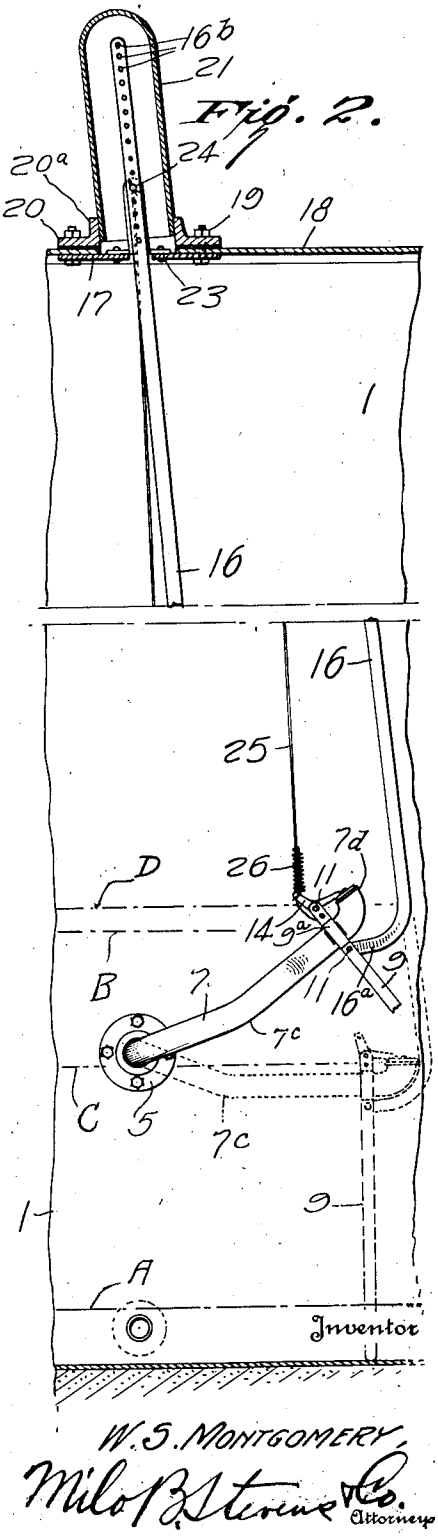


Fig. 2.



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Fig. 3.

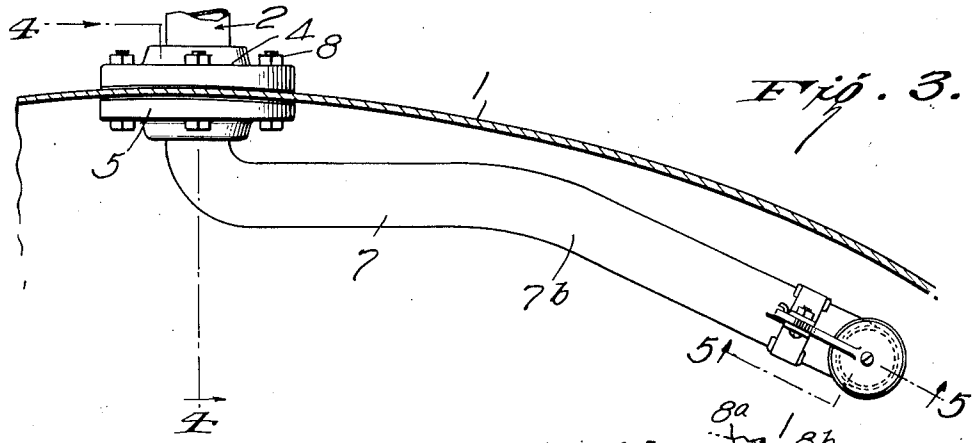


Fig. 4.

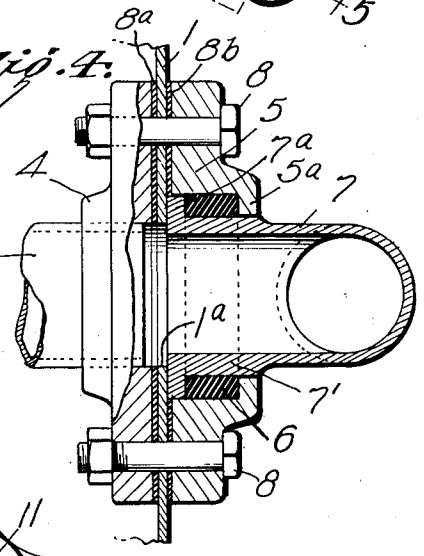


Fig. 5.

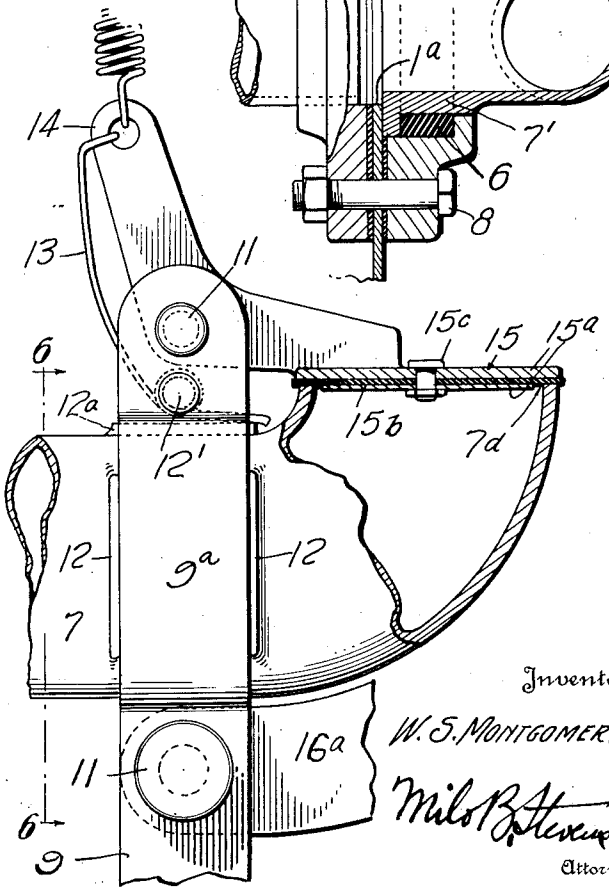
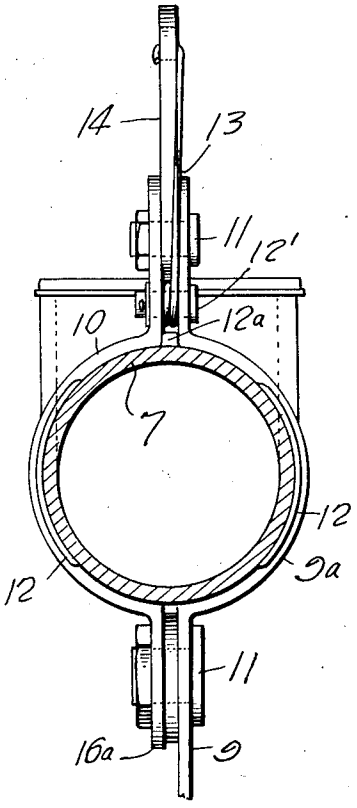


Fig. 6.



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Patented Aug. 6, 1929. 1,723,197

UNITED STATES PATENT OFFICE.

WELLINGTON S. MONTGOMERY, OF EL DORADO, KANSAS.

ADJUSTABLE OIL OUTLET.

Application filed June 16, 1927. Serial No. 199,311.

My invention relates to adjustable outlets for tanks and the like,—and particularly to one which is especially adaptable for crude oil stock tanks into which the oil is pumped either directly or indirectly from the wells.

Oil as pumped from the wells contains,—in addition to the merchantable crude oil,—water and sediment, the latter being known in the industry as B. S. (basic sediment). The water and B. S. settles to the bottom of the stock tank, the B. S. floating above the water. Refining companies buying the crude oil connect their lines direct to an outlet pipe of the stock tank which is located at least two inches above the normal B. S. line. Inasmuch as the proportion of B. S. and water in a tank will vary, and also since some refining companies insist that their lines be connected to the tanks at distances greater than two inches above the B. S. line,—it is the usual practice to drain off the water and B. S. through a bottom outlet of the tank so as to bring the B. S. line down to the required distance below the line of merchantable crude oil and the refining company's outlet. The thick muggy B. S. is hard to drain out and when attempting to do so, a funnel-shaped hole forms in the B. S. leading to the drain pipe. The result is that considerable quantity of the good merchantable oil runs down this funnel-shaped hole, drains out and is lost.

It is, therefore, the primary object of this nvention to overcome the difficulty mentioned and prevent the loss of merchantable crude oil by the provision of an outlet pipe carried by the tank, and having a portion extending therein which can be readily set to a predetermined level with respect to the B. S. line, thus avoiding the necessity of draining of the B. S. to lower it to a desired level.

Another object of the invention is to provide in an oil stock tank, or the like, an adjustable outlet pipe which can be readily applied, and wherein novel means is provided to prevent leakage at its point of attachment without however interfering with the free adjustment of the pipe.

A further object of the invention resides in the provision of an outlet pipe as set forth, having means whereby it is prevented from moving below a predetermined level.

The invention also has for an object to furnish a novel adjusting means for holding the outlet pipe in a predetermined elevated position.

A still further obect of the invention is to provide an adjustable outlet pipe, as characterized, having a novel adjustable closure and controlling means therefor which may or may not be combined with a means for supporting the pipe against movement below a predetermined level.

The foregoing and other objects of the invention are attained by means of a novel combination and arrangement of parts to be hereinafter described and claimed and in order that the same may be better understood, reference should be had to the accompanying drawings which depict what I now regard as a preferred mechanical expression of the invention. It is to be understood, however, that many changes and modifications may be made in the structure shown and described, without however departing from the spirit and scope of the subject matter claimed.

In the drawings wherein the same reference characters designate the same parts in all views,

Figure 1 illustrates the application of my invention to a conventional stock tank, a portion of which is shown in longitudinal section,—the adjustable outlet being shown in end elevation;

Figure 2 is a view taken at a right angle to Figure 1 from a point within the tank (line 2—2 Fig. 1) and showing the outlet in side elevation;

Figure 3 is a top plan view of the outlet, on enlarged scale, and showing a portion of the tank wall in section;

Figure 4 is a section on the line 4—4 of Figure 3;

Figure 5 is an enlarged side elevational view, partly broken and partly in section, of the end of the adjustable outlet pipe and showing a valve or closure for its mouth together with fragments of the controlling and supporting means of the pipe, and

Figure 6 is a section on the line 6—6 of Figure 5.

Referring specifically to the drawings, 1 denotes the tank, and as shown in Figure 1 the water, B. S., normal outlet, and adjusted outlet levels are indicated at A, B, C, and D, respectively.

The outlet pipe 2, to which the refining

company's line 2^a is adapted to be connected, is shown threaded or otherwise secured in the neck of a disk-like fitting 4. A lock cock 3 controls the flow of oil to pipe 2. Referring to Figure 4, an inside fitting 5 is shown provided with a central hole and an offset flange 5^a extending inwardly as shown to engage the enlarged end 7′ of the short branch of a substantially L-shaped pipe 7 which is the outlet pipe forming the subject matter of this invention.

The enlarged end 7′ of the outlet pipe 7 has an outturned marginal flange 7^a at its end which engages the wall of the tank 1 around an outlet hole 1^a therein. Between the flange 7^a and the inturned outset 5^a of the fitting 5 is located a rubber washer 6. Between the outer and inner fittings 4, 5, are disposed fiber washers 8^a, 8^b. When the two fittings 4, 5, are drawn tightly together by bolts 8 a leak-proof connection will have been made, the washer 6 being tightly compressed between the flanges 5^a, 7^a. However, it will be understood that the outlet pipe 7 is capable of being swung or rotated in its bearing which is provided by the inner fitting 5.

Again referring to Figure 4 it is observed that the hole 1^a in the tank is located at the estimated normal outlet level for the merchantable crude oil,—that is to say two inches above the normal level of B. S. However, as shown in the drawing the level of B. S. is considerably higher than usual.

The formation of the outlet pipe 7 will be best understood by examination of Figures 1, 2, and 3. For instance, in order that the pipe 7 may clear the wall of the tank it is provided with an intermediate horizontal bend 7^b; also as depicted in Figure 2 the outlet pipe 7 has a downward bend or offset 7^c so that when the pipe 7 is at its lowermost point of movement the upturned mouth 7^d will be in true horizontal alinement with the bottom of the hole 1^a.

The outlet pipe 7 is limited in downward movement by the prop or support 9 which has a semi-circular offset 9^a adjacent its upper end which is designed to embrace one side of the outlet pipe 7. A semi-circular clamp segment 10 which is bolted to the support 9 as indicated at 11 serves to rigidly attach the support 9 to the pipe. In order that the support 9 be held in a set position the pipe 7, as shown in Figures 5 and 6, is provided at either side with a pair of spaced ribs 12 which engage the side edges of the clamp 10 and the arcual offset 9^a. This prevents axial movement of support 9 and rotative movement thereof is prevented by means of a short longitudinal rib 12^a formed on the pipe and engaging between the upper ends of the clamp 9 and support 10.

The upper parallel ends of the clamp 10 and support 9 terminate a fairly substantial distance above pipe 7 so as to provide a space below the upper clamp bolt 11 for the intermediate mounting pin 12′ which extends through the eyelet of a spring 13, one arm of which bears against the subjacent rib 12^a while the other arm is hooked to engage in the eye in the upper end of one arm of a bell-crank lever 14, the other arm of which carries the valve or closure 15 for sealing the mouth 7^d of the outlet pipe 7. The bell-crank lever 14 is pivoted to the upper clamp bolt 11 between the parallel upper ends of the clamp 10 and support 9, as shown. The tendency of spring 13 is to hold the closure 15 open.

As shown the closure 15 comprises inner and outer plates 15^a with an interposed felt disk 15^b, the assembly being bolted together as at 15^c. The upper disk 15^a may be formed integral with the bell-crank 14, as shown.

In order to elevate the outlet pipe 7 to position its mouth the desired distance above the B. S. level a strap metal rod 16 is provided having its curved end 16^a pivoted upon the lower clamp bolt 11 and between the lower parallel portion of support 9 and clamp 10. The upper end of rod 16 is provided with a series of spaced apertures 16^b which are preferably spaced equi-distant from each other,—for instance one inch. The rod 16 extends up through a slot in a circular disk 17 which is bolted against the under surface of the upper end 18 of the tank as indicated at 19. The bolts 19 also serve to secure in place, the centrally apertured plate 20, in whose neck 20^a may be secured the bull plug 21 which latter may be used when it is desired to make the tank gas tight. The use of the bull plug 21 is optional, of course.

Upon the plate 17 the right angular strap 22 is bolted as indicated at 23 so that its upstanding portion will lie substantially flush with the upper end of rod 16. A pin 24 carried by the metal strap 22 may be located in any one of the aperatures 16^b to hold the mouth 7^d of the outlet pipe the required distance above the B. S. level,—whatever that may be.

The purpose of the closure 15 for the mouth of the pipe 7 is to prevent any B. S. from accumulating in pipe 7 before the same is elevated to the required level.

The closure 15 may be closed by means of a chain or other flexible connection 25 which is connected to the aperture of the upper bell-crank lever arm by means of a spring 26. At the upper end of the chain 25 is a hook 27, the chain being passed through a hole 28 in the tank top so that the hook can be engaged over the pin 24 of the right angular metal strap 22. When the hook 27 is engaged with pin 24 the valve or closure 15 will be closed. It will be understood, of course, that spring 26 will necessarily be considerably stronger than spring 13. Also the chain 25 or the hook 27 will necessarily have to have a laterally projecting

element to prevent the hook from slipping down through the hole 28 through which the chain passes. In the present form of the invention as shown,—the hook 27 is of such size as to prevent its passage through the hole 28.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a tank or the like having an outlet, an adjustable outlet pipe rotatably mounted in said outlet and extending into said tank, a prop having a semi-circular portion adjacent one end, a clamp cooperating with the semi-circular portion of said prop to embrace said outlet pipe whereby the prop will support said pipe in a predetermined position, an arm pivoted between said prop and clamp and extending upwardly through the top of said tank, means associated with said arm and tank for holding the pipe in a predetermined elevated position, a closure for the mouth of said outlet pipe, a lever pivotedly carried in part by said clamp and in part by said prop and to which said closure is secured whereby the same can be moved to and from operative position, spring means in part carried by said clamp and in part by said prop for normally tending to maintain such closure open, and a connection attached to said lever and extending up through the top of said tank whereby said closure can be operated.

2. The combination set forth in claim 1,— and said connection being engageable with said tank and arm associated means for maintaining the closure shut against the action of said spring.

3. The combination set forth in claim 1,— and transverse ribs formed on the sides of said outlet pipe and engaging the edges of said clamp and prop to prevent axial movement of the same, and an axial rib formed upon said pipe and disposed between the ends of said clamp and prop to prevent rotation of the prop upon said pipe.

4. In a tank or the like having an outlet, a substantially L-shaped outlet pipe having a short branch rotatably mounted in registry with said outlet and having another branch extending laterally within the tank, the last mentioned branch having an intermediate downward offset and an upturned mouth, the said downward offset being arranged so that the edge of said mouth will be alined in a plane with the bottom of the tank outlet, and a prop carried by said outlet pipe and adapted to engage the bottom of said tank to prevent lowering of said pipe below the plane of said tank outlet.

5. The combination set forth in claim 4,— and means operable for raising and maintaining the mouth of said outlet pipe a predetermined distance above the plane of said tank outlet.

6. The combination set forth in claim 4,— and attaching means for said prop and in part formed by the same, means operable for raising and maintaining the mouth of said outlet pipe a predetermined distance above the plane of said tank outlet, and said outlet pipe raising means being in part carried by said prop attaching means.

7. In a tank or the like having an outlet, a substantially L-shaped outlet pipe having a short branch rotatably mounted in registry with said outlet and having another branch extending laterally within the tank, a prop carried by said outlet pipe and adapted to engage the bottom of said tank to prevent lowering of said pipe below the plane of said tank outlet, a lever pivotedly connected to said prop at one side of said outlet pipe and operable through the top of said tank for raising said outlet pipe to a predetermined level, a closure for the mouth of said outlet pipe, an arm pivoted to said prop at the opposite side of said pipe from the pivot point of said lever, and means connected to said arm and operable from without the tank for controlling the movement of said closure.

8. The combination with a tank wall; of an outlet pipe comprising an angular pipe section having a circumferential flange at one end and an inlet mouth at the other end, an attaching plate having a hole therethrough and an offset inturned flange, said outlet pipe being insertable through said fitting or attaching plate, a washer confined within said attaching plate and between its flange and the flange of said pipe whereby to effect a seal and permit rotation of said outlet pipe, the bolting of said attaching plate to the wall of said tank serving to compress said washer between said flanges, and means for controlling the movement of said outlet pipe.

9. The combination set forth in claim 8,— and a prop carried by said outlet pipe for preventing the lowering movement of the mouth thereof below said attaching plate hole.

10. An outlet pipe for tanks comprising an angular pipe section having a circumferential flange at one end, an attaching plate having a hole therethrough and an offset inturned flange, said outlet pipe being insertable through said fitting or attaching plate, a washer confined within said attaching plate and between its flange and the flange of said pipe whereby to effect a seal and permit rotation of said outlet pipe, the bolting of said attaching plate to the wall of said tank serving to compress said washer between said flanges, means for controlling the movement of said outlet pipe, and a prop carried by said outlet pipe for limiting the movement of the same in one direction, a closure for the mouth of said outlet pipe, and said closure being swingingly carried by said prop, said closure having operating means accessible from without the tank.

11. In combination with a tank wall outlet

opening, a swingable outlet pipe within the tank and communicating with said opening, prop means carried by the outlet pipe and engageable with the tank bottom for preventing movement of the inlet end thereof below the plane of said outlet opening, means for actuating said outlet pipe and maintaining the same in different predetermined positions, and said actuating means being connected to said prop means.

12. In combination with a tank wall outlet opening, a swingable outlet pipe within the tank and communicating with said opening, limiting means in part carried by said outlet pipe for preventing movement of the inlet end thereof below the plane of said outlet opening, pipe actuating means connected to said limiting means, and a closure for the inlet end of said pipe and carried by said limiting means.

13. In combination with a tank wall outlet opening, a swingable outlet pipe within the tank and communicating with said opening, actuating means for said pipe and secured thereto, a closure for the inlet end of said pipe, and mounting means for said closure and carried by said actuating means.

In testimony whereof I affix my signature.

WELLINGTON S. MONTGOMERY.