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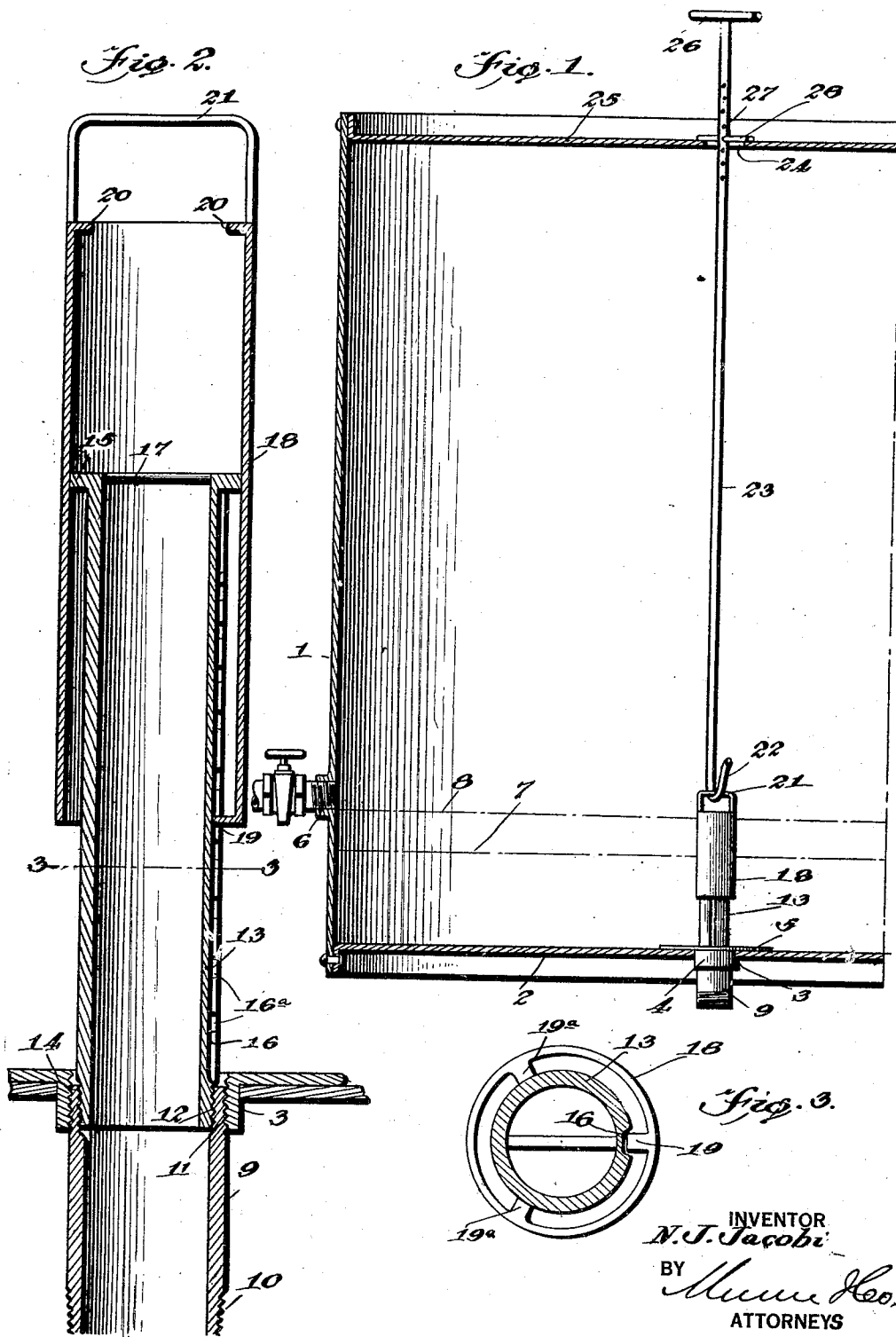
N. J. JACOBI

1,694,471

OIL SAVER

Filed Jan. 5, 1927

2 Sheets-Sheet 1



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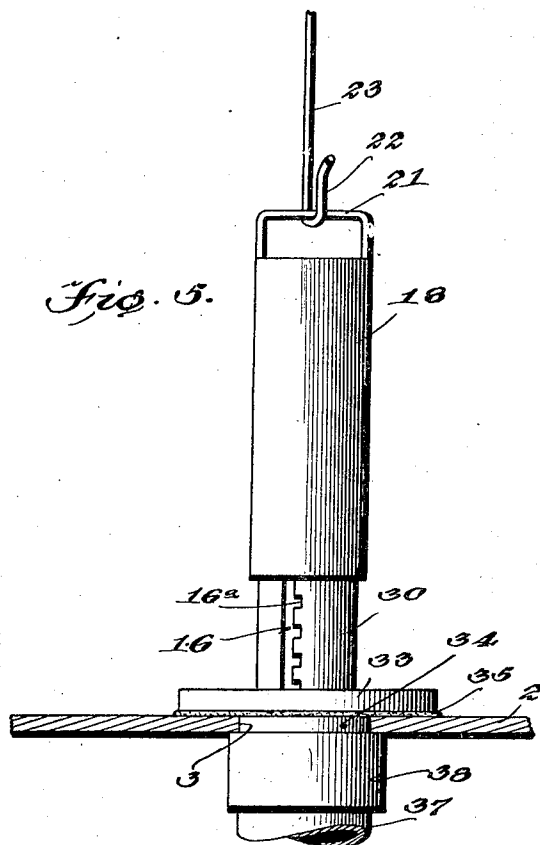
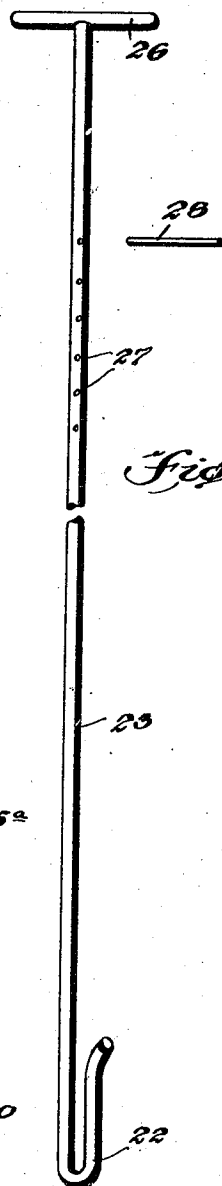
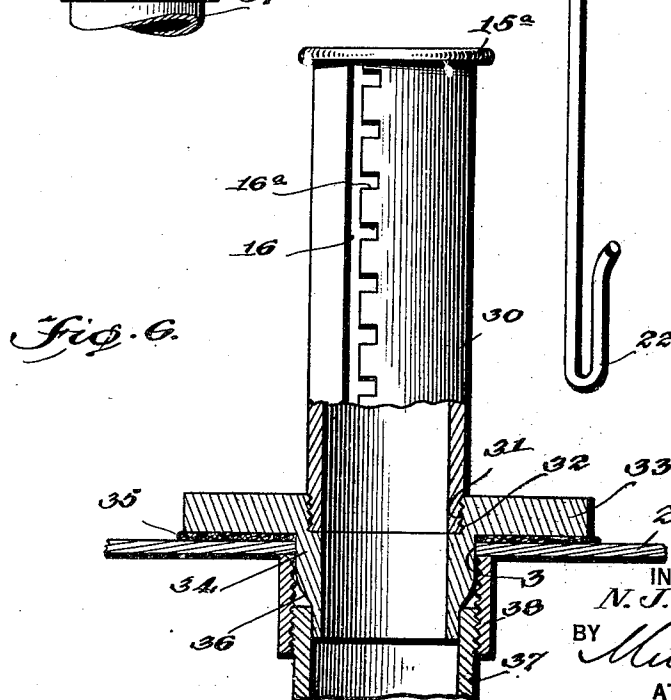
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INVENTOR  
N. J. Jacobi,  
BY *Munn & Co.*  
ATTORNEYS

## UNITED STATES PATENT OFFICE.

NORBERT J. JACOBI, OF ELECTRA, TEXAS.

## OIL SAVER.

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My invention relates to improvements in oil savers for storage tanks, and it consists in the combinations, constructions and arrangements herein described and claimed.

All storage tanks of the type now used in the field have their delivery outlets located at a considerable distance above the bottom of the tank and are provided with normally closed drainage outlets in their bottoms. Sediment accumulates in the bottoms of the tanks and when the accumulation of sediment in a tank is several inches below the level of the delivery outlet, it ordinarily is required that the tank be drained so as to prevent sediment from passing from the tank with the oil through the delivery outlet. It will be obvious that a considerable quantity of oil that is usable will remain in a tank between the level of the delivery outlet and the accumulation of sediment in the tank after the level of oil in the tank has been lowered below the delivery outlet and before the drain outlet has been opened. Such oil ordinarily is wasted since the opening of the drain outlet will cause the sediment to so mingle with the oil in the tank as to render the cost of the subsequent separation of the oil from the sediment prohibitive.

An object of the present invention is to save the oil in the bottom of the tank below the level of the delivery outlet by providing facilities for removing such oil from the tank without permitting the sediment in the bottom of the tank to mingle with the oil.

A further object of the invention is the provision of an oil saver which is adapted to be associated with the drain opening in the bottom of the tank and which includes vertically extensible removable liquid conducting means within the tank for drawing off the oil below the delivery outlet gradually from the tank without appreciable disturbance of the sediment within the tank.

Other objects and advantages of the invention will be apparent from the following description, considered in conjunction with the accompanying drawings, in which

Figure 1 is a vertical section through a storage tank equipped with an oil saver embodying the invention,

Figure 2 is a relatively enlarged vertical section through the oil saver,

Figure 3 is a section substantially along the line 3—3 of Figure 2,

Figure 4 is a perspective group view of the

operating and adjustment controlling means of the oil saver,

Figure 5 is a view showing a fragmentary portion of the bottom of a storage tank in vertical section and showing a modified form of oil saver embodying the invention in side elevation and in a position adjacent to the drain outlet of the tank bottom, and

Figure 6 is a fragmentary view mainly in side elevation and partly in vertical section, showing the liquid conducting member of the modified form of oil saver in association with the drain outlet of a tank.

In Figure 1, the numeral 1 designates an oil storage tank having a bottom 2 provided with an opening 3 in which is secured a short bushing 4 having a sealing flange 5 at its upper end resting on the tank bottom 2. The tank 1 is provided with a delivery outlet 6 which is located a substantial distance above the bottom 2. When a considerable quantity of sediment has accumulated in the tank 1, as for example, to the level indicated at 7, it ordinarily is required that the tank be drained and the sediment thus removed. Oil then is drawn off through the delivery outlet 6 until the level of oil within the tank is located approximately at 8 and it will be manifest that usable oil remains in the tank between the levels 7 and 8. Such oil can be removed without appreciable disturbance of the sediment below the level 7 when the tank is equipped with an oil saver embodying the invention.

In equipping the tank with an oil saver embodying the invention, I may make use of a special reducer nipple 9 having external screw threads 10 at its lower end adapted for connection with a suitable section of a drain pipe, not shown, and having external screw threads 11 at its upper end adapted to engage with internal screw threads on the bushing 3. The upper end portion of the nipple 9 also is provided with internal screw threads 12 for a purpose to be presently described. The body of the improved oil saver shown in Figures 1 and 2 comprises a tubular member 13 having its lower end portion provided with external screw threads 14 adapted to engage with the screw threads 12 on the upper end portion of the nipple 9 and having an outwardly extending flange or bead 15 at its upper end. The member 13 preferably is of sufficient length to extend vertically within the tank to the highest level to which sedi-

ment will be permitted to accumulate within the tank before the tank is drained. The member 13 is formed with a longitudinally extending guide groove 16 in its outer wall having spaced lateral seats 16<sup>a</sup> in a side wall thereof and with a rigid cross bar 17 at its upper end.

The body of the oil saver also comprises a vertically adjustable tubular member 18 which has a close sliding fit with the flange 15 of the member 13 and has an inturred lug 19 at its lower end in sliding contact with the groove 16 and engageable with the seats 16<sup>a</sup> selectively and with shorter inturred lugs 19<sup>a</sup> cooperating with the body of the member 13, the lug 19 and the groove 16 and the flange 15 to maintain the member 18 in smooth sliding contact with the flange 15. The tubular member 18 has a pair of opposite inwardly extending stop lugs 20 at its upper end for engaging with the flange 15 to limit the downward sliding movement of the member 18 on the member 13. It, of course, will be understood that the lugs 19 and 19<sup>a</sup> at the lower end of the member 18 are bent inwardly into engagement with the groove and the outer wall of the member 13, respectively, after the member 18 has been placed on the member 13. The length of the member 18 is preferably nearly as great as that of the portion of the member 13 that is upstanding within the tank so that the lower end of the member 18 will be disposed close to the bottom of the tank when the lugs 20 rest on the flange 15 and the member 18 is at the limit of its downward movement on the member 13. The member 18 is provided with a bail 21 at its upper end which is adapted to be engaged by a hook 22 at the lower end of an operating rod 23 which depends through an opening 24 in the top 25 of the tank 1 and has a handle 26 at its upper end whereby it can be grasped and manipulated to adjust the member 18 vertically on the member 13 as desired. The portion of the operating rod 23 that extends through the opening 24 in the top of the tank has a vertical series of spaced transverse openings 27 with which a supporting pin 28 may be engaged selectively, the length of the pin 28 being greater than the diameter of the opening 24 so that the end portions of the pin 28 will rest on the top 25 and will support the operating rod 23 in the tank 1 and consequently limit the downward movement of the member 18 on the member 13.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. During the normal operation of the tank, the operating rod 23 will be supported in the position shown in Figure 1 so as to maintain the member 18 raised on the member 13 substantially to the level of the delivery outlet. When the tank is to be drained and cleaned and the level of oil within the tank is at 8, the pin 28 is re-

moved from the opening 27 in which it is disposed as shown in Figure 1 and is placed in a higher opening 27 so as to prevent accidental lowering of the member 18 on the member 13 below the level of the sediment in the tank. The operating rod 23 then is manipulated to gradually lower the member 18 on the member 13 from the position shown in Figure 1 until the level of the upper end of the member 18 is at the level of the sediment within the tank, the drain outlet or pipe for the tank first having been opened so that the oil will be drawn off through the members 18 and 13 into the drain pipe as the member 18 is gradually and slowly lowered on the member 13. The member 18 will serve as a shield against the passage of sediment into the member 13 and the oil will be drawn off without any appreciable disturbance or agitation of the sediment in the tank and without any of such sediment being entrained with the oil. When all the usable oil has been removed from the tank in the manner just described, the pin 28 is disengaged from the operating rod and the operating rod is manipulated to disengage the hook 22 from the bail 21 and to place the hook 22 in engagement with the cross bar 17 at the upper end of the member 13. The operating rod 23 then is manipulated to unscrew the member 13 from the nipple 9 and the members 13 and 18 are raised as a unit within the tank as required to permit unobstructed passage of the sediment from the lower part of the tank through the nipple 9, after which the members 13 and 18 are lowered as a unit until the lower end of the member 13 is disposed at the upper end of the nipple 9 and the operating rod 23 then is manipulated to screw the member 13 to place in the upper end portion of the member 9.

In carrying out the invention in the form exhibited in Figures 5 and 6, I may omit the hereinbefore described member 13 and in lieu thereof I use a tube 30 which may be identical with the tube 13 except that the externally threaded lower end portion 31 of the tube 30 is shorter than the externally screw threaded lower end portion of the tube 13. The screw threaded lower end portion 31 of the tube 30 is adapted to be screwed into a screw threaded counter bore 32 in the flange 33 at the upper end of a relatively heavy tubular base member 34. The tubular base member 34 is adapted to fit rather snugly into the opening 3 of the tank bottom 2 until a sealing gasket 35 on the tubular base member 34 is compressed between the bottom 2 and the flange 33. The lower end portion of the tubular base member 34 may be tapered externally as indicated at 36 both to facilitate the insertion of the tubular base member 34 in the opening 3 and to reduce the lower end portion of the tubular base member 34 in size sufficiently to adapt it to enter the upper end of a drain

pipe 37 that is in screw threaded engagement with a connecting nipple 38 which depends from the tank bottom 2 in encircling relation to the opening 3. The flange 33 is relatively heavy, as clearly shown in Figures 5 and 6 and the flanged tubular base member 34 will remain by gravity in position to produce a fluid pipe joint between itself and the tank bottom 2 when the tubular base member 34 is in the position shown in Figures 5 and 6 and particularly when a gasket 35 is disposed between the flange 33 and the tank bottom 32.

It will be understood that the tubular member 18 is used with the member 30 in the same manner as with the tubular member 13.

The operation of the form of the device exhibited in Figures 5 and 6 is identical in essential respects with the operation of the form of the device exhibited in Figure 1.

Obviously, the invention is susceptible of embodiment in forms other than those which are illustrated in the accompanying drawings and I therefore consider as my own all such modifications and adaptations thereof as fairly fall within the scope of the appended claims.

I claim:

1. An oil saver for a tank having a drain opening in its bottom comprising a tubular member having an externally screw threaded lower end portion, a tubular base member having a relatively large and heavy flange at its upper end and having a lower end portion formed with a downwardly tapering external wall, said base member having a screw threaded counterbore in its flanged upper end for engaging with the threaded lower end portion of the first tubular member, a gasket on the tubular base member underneath the flange, said tubular base member being adapted to be lowered through said tank until the tapering lower end portion thereof depends into the drain opening and until the gasket is clamped between said flange and the tank bottom, and a second tubular member vertically adjustable on said first named tubular member.
2. An oil saver comprising a tubular member having a lower end portion adapted to fit in a drain outlet in the bottom of a storage tank, said tubular member having an outwardly extending flange at its upper end and having a longitudinally extending channel in its outer wall, and a second tubular member slidably fitting on the flanged portion of said first named tubular member and having an in-turned lug at its lower end entering and engaging with said longitudinal groove in the first named tubular member, said second named tubular member having an in-turned stop projection at its upper end for cooperating with the flange on the first named tubular member to limit the down-

ward movement of the second tubular member on the first tubular member, said second tubular member also having a plurality of other in-turned lugs at its lower end spaced circumferentially of the second tubular member with respect to one another and to the first named inturned lug and adapted to slide in contact with the outer face of the first named tubular member.

3. An oil saver comprising a tubular member having a lower end portion adapted to fit in a drain outlet in the bottom of a storage tank, said tubular member having an outwardly extending flange at its upper end and having a longitudinally extending channel in its outer wall, and a second tubular member slidably fitting on the flanged portion of said first named tubular member and having an in-turned lug at its lower end and entering and engaging with said longitudinal groove in the first named tubular member, said second named tubular member having an in-turned stop projection at its upper end for cooperating with the flange on the first named tubular member to limit the downward movement of the second tubular member on the first tubular member, said channel in the outer wall of the first named tubular member having a plurality of spaced lateral seats in the side wall thereof, each of said seats being adapted for the reception of said in-turned lug on the second named tubular member.

4. An oil saver for a tank having a drain opening in its bottom comprising a tubular formation provided with a relatively large and heavy flange having a depending tubular portion to extend through the drain opening and provided with a downwardly tapering external wall at its lower end, said formation being also provided with an upstanding tubular portion to extend upwardly from the tank bottom, a gasket on said depending tubular portion seating against the under face of said flange, and a tubular member mounted and vertically adjustable on said upstanding tubular portion and forming an extensible part thereof to variably adjust its height, said tubular formation being adapted to be bodily lowered through said tank until the tapering lower end of its depending tubular portion extends into the drain opening in the tank bottom and the gasket engages and is clamped between the tank bottom and the heavy overlying flange.

5. An oil storage tank having a main discharge outlet in its side determinately above its bottom, and having a bottom sediment drain outlet, a lower drain tube having its lower end removably positioned and supported in said drain outlet and its upper end terminating below the line of said main discharge outlet, a second drain tube telescopically mounted on the first drain tube and adjustable vertically thereon to move and position its upper intake end from below to a position substantially at

the level of said main discharge outlet in the side of the tank and an adjusting and tube lifting member connected to said upper drain tube and extending vertically through one  
5 end of the tank for external manipulation, said upper drain tube having means to engage the lower drain tube to lift its lower end from and above said drain outlet.

6. An oil storage tank having a main discharge outlet in its side determinately above  
10 its bottom, and having a bottom sediment drain outlet, a lower drain tube having its lower end removably positioned and supported in said drain outlet and its upper end  
15 terminating below the line of said main discharge outlet, and a second drain tube telescopically mounted on the first drain tube and adjustable vertically thereon to move and position  
20 its upper intake end from below to a position substantially at the level of said main discharge outlet in the side of the tank, and an adjusting and tube removing member

extending from the upper drain tube upwardly through the top of the tank for external manipulation.

7. An oil storage tank having a main discharge outlet in its side determinately above  
25 its bottom and having a bottom sediment drain outlet, an oil saving drain tube having a supporting flange above its lower end to engage the tank bottom and position its lower  
30 end in said drain outlet, the upper end of said drain tube terminating substantially below the level of said main side discharge outlet and a second and upper drain tube telescopically  
35 mounted on said first tube for adjustment of its upper intake end vertically thereon from a position below to a position substantially at the level of said main side delivery outlet, with means for positioning, adjusting  
40 and removing said drain tubes extending upwardly through the top of the tank for external manipulation.

NORBERT J. JACOBI.