

April 25, 1939.

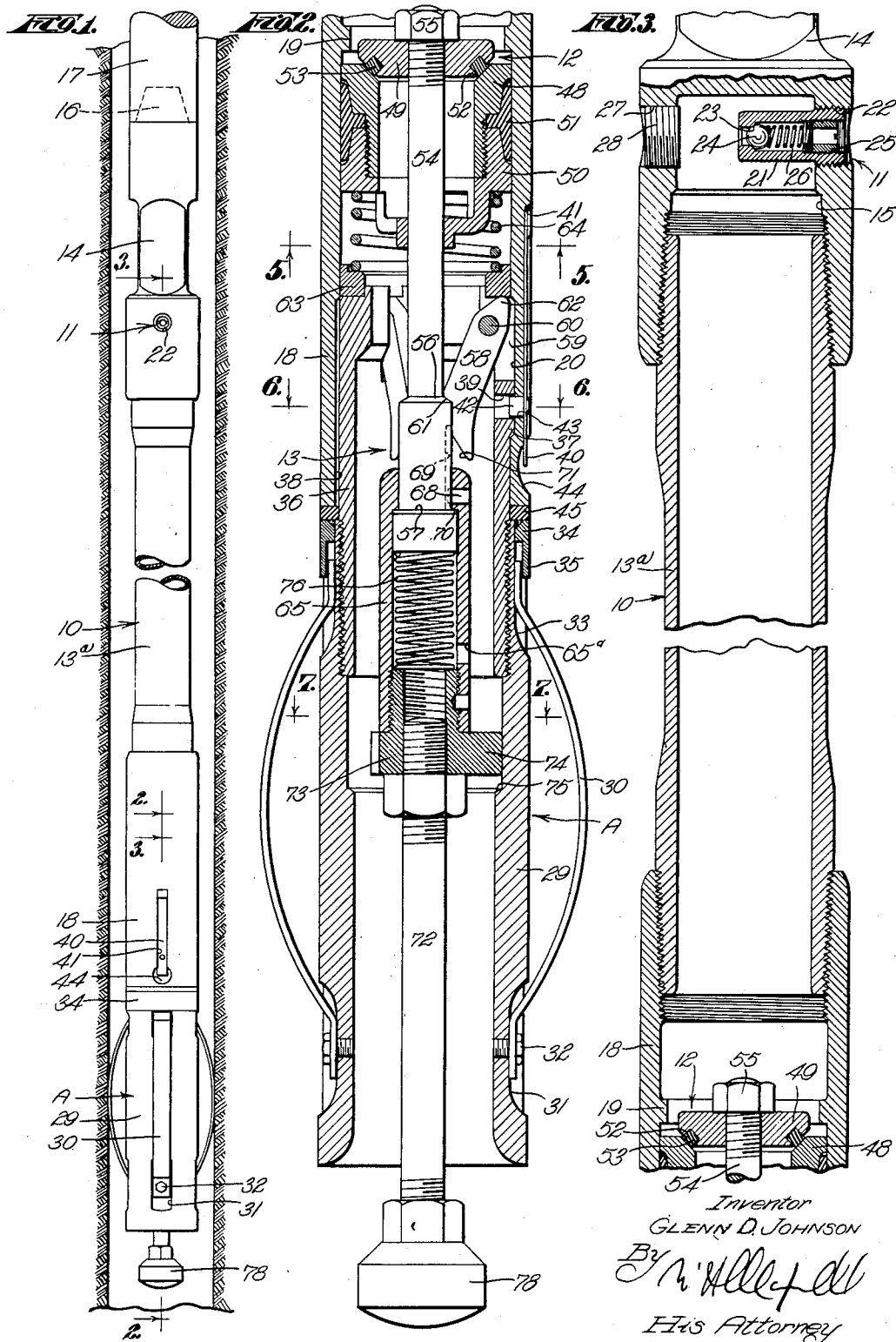
G. D. JOHNSON

2,155,601

BAILER

Filed Aug. 22, 1936

2 Sheets-Sheet 1



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BAILER

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2 Sheets-Sheet 2

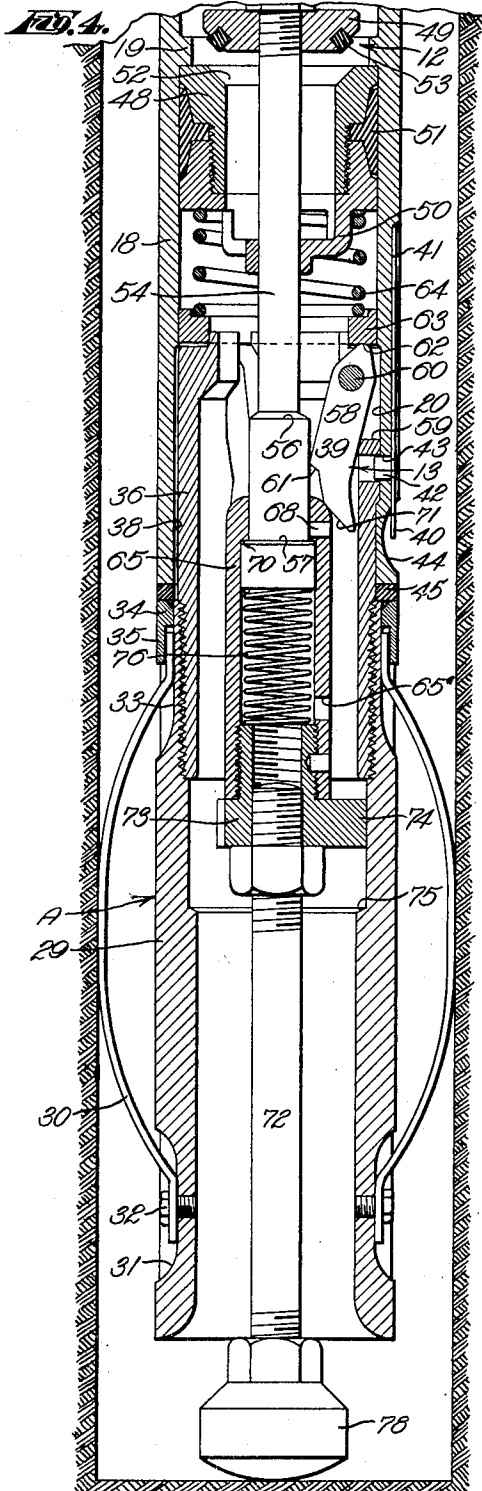


Fig. 5.

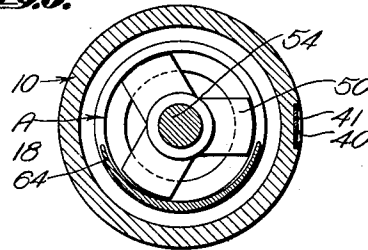


Fig. 6.

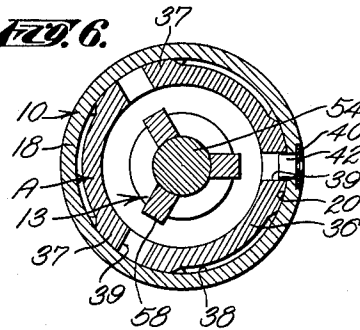


Fig. 7.

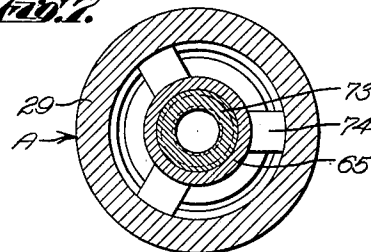
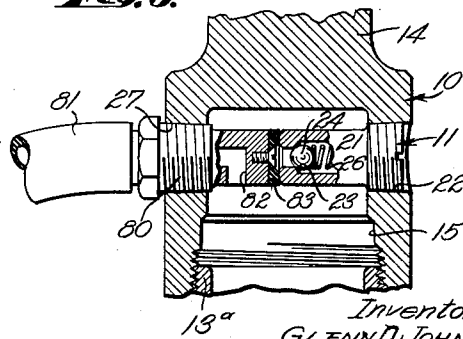


Fig. 8.



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UNITED STATES PATENT OFFICE

2,155,601

BAILER

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11 Claims. (Cl. 166—19)

This invention relates to a well tool and relates more particularly to a bailer for removing and recovering material from wells. A general object of this invention is to provide a well bailer for use in deep wells that is dependable in operation and that is easy and convenient to assemble, dump and clean.

Another object of this invention is to provide a well bailer that embodies a novel and particularly effective inlet valve that does not open or unseat prematurely.

Another object of this invention is to provide a well bailer embodying a floating seat for the inlet valve that moves with the valve under the action of the heavy hydrostatic pressures in the well so that the valve is not unseated by such pressures. The valves of typical well bailers often become prematurely opened by the heavy hydrostatic pressures encountered in the wells so that the bailers become filled before reaching the selected positions. The bailer of the present invention embodying a floating valve seat overcomes this common defect or insufficiency.

Another object of this invention is to provide a bailer of the character mentioned that embodies a dependable latch control for the valve.

Another object of this invention is to provide a well bailer in which the entire assembly of the valve mechanism and its control may be easily removed from the bailer body to permit dumping of the bailer and cleaning of the said assembly.

Another object of this invention is to provide an improved well bailer that is adapted to obtain a full, uncontaminated sample or load of fluid from a selected zone in the well.

Another object of this invention is to provide a well bailer that is effective and positive in operation in situations where very high hydrostatic pressures exist.

Another object of this invention is to provide an improved well bailer that is convenient to handle and operate and that is particularly easy to assemble, clean, etc.

The various objects and features of my invention will be fully understood from the following detailed description of a typical preferred form and application of the invention, throughout which description reference is made to the accompanying drawings, in which:

Fig. 1 is a side elevation of the bailer provided by this invention in position in a well. Fig. 2 is an enlarged fragmentary longitudinal detailed sectional view of the lower portion of the bailer taken as indicated by line 2—2 on Fig. 1. Fig. 3 is a fragmentary longitudinal detailed sectional

view taken as indicated by line 3—3 on Fig. 1. Fig. 4 is a view similar to Fig. 2 showing the parts in the actuated or tripped positions. Figs. 5, 6 and 7 are transverse detailed sectional views taken as indicated by lines 5—5, 6—6 and 7—7, respectively, on Fig. 2 and Fig. 8 is a fragmentary longitudinal sectional view illustrating the manner in which the bailer body may be emptied and flushed out by fluid under pressure.

The well bailer of the present invention includes, generally, a hollow or tubular body 10 for receiving fluid from the well, a relief valve 11 on the upper end of the body 10, and an assembly A removably secured to the lower portion of the body 10 and comprising an inlet valve means 12 and a control 13 for the valve means 12.

The body 10 is provided to carry the assembly A and the other parts of the bailer and to receive and contain the sample or fluid obtained from the well. The body 10 includes one or more lengths 13^a of tubing of the desired diameter. In practice the tubing 13^a of the body 10 may be formed of standard externally upset tubing as illustrated. It is to be understood that the body 10 may include as many lengths of tubing 13^a as required to have the desired fluid capacity. The body 10 includes a connecting member or sub 14 on the upper end of the uppermost length of tubing 13^a. In the case illustrated the sub 14 has a socket 15 in its lower end receiving the upper end portion of the uppermost body tubing 13^a and has a pin 16 on its upper end threaded into the lower end of a rope socket 17 or the like. A cable, a string of rods or a string of pipe may be connected with the sub 14 to carry and operate the bailer.

The body 10 further includes a tubular section 18 secured to the lower end of the lowermost length of tubing 13^a. The body section 18 may be threaded on the lower end portion of the lowermost length of tubing 13^a and may be somewhat larger in diameter than the tubing 13^a. The body section 18 may be threaded on the lower end portion of the lowermost length of tubing 13^a and may be somewhat larger in diameter than the tubing 13^a. The body section 18 is provided to receive and house certain parts of the assembly A, as will be hereinafter described, and its interior is shaped to have co-operation with certain elements of the assembly A. An annular ridge or shoulder 19 is provided on the interior of the body section A adjacent its upper end. An annular recess 20 is provided in the interior of the section 18 and is spaced some distance above its lower end. The

end walls of the annular recess 20 may be tapered or inclined as illustrated.

The relief valve 11 is provided to permit the discharge of excessive pressure from the body 10 when the bailer is withdrawn from the liquid in the well following the loading operation. In accordance with the invention the relief valve 11 is adjustable to open under a preferred or selected internal pressure in the body 10. The relief valve 11 includes a tubular valve body 21 threaded in an opening 22 in the wall of the sub 14 to project into the open upper portion of the socket 15. An outwardly facing valve seat 23 is provided on the interior of the valve body 21 and a ball valve 24 is adapted to cooperate with the seat. A tubular screw 25 is threaded in the outer portion of the valve body 21 and a spring 26 is arranged under compression between the ball valve 24 and the screw 25 to urge the valve against the seat 23. The screw 25 is slotted so that it may be easily threaded to regulate the action of the valve 26. A port 27 may be provided in the wall of the sub 14 to communicate with the socket 15. The port 27 may be employed in flushing out and cleaning the body 10. A threaded plug 28 normally closes the port 27.

The assembly A embodies the valve means 12, the control 13 and various associated parts and, in accordance with the invention is removable from the body 10 to permit the easy cleaning of the body 10 and the assembly. The removable assembly A includes a tubular section 29 normally removably secured to the lower end of the body 10 to constitute a continuation of the bailer body. The section 29 may be of the same diameter as the body section 18 and its lower end is open to receive the well fluid. The lower end portion of the section 29 may be shaped to operate as a guide. Guide springs 30 may be provided on the section 29. The springs 30 are arranged longitudinally of the section 29 and are bowed outwardly between their ends to have yielding contact with the interior of the well casing and the wall of the well. The lower end portions of the springs 30 are received in grooves 31 in the exterior of the section 29 and are secured to the section by screws 32. The upper portions of the springs 30 are received in grooves 33 and are adapted to shift as the springs are flexed. A retaining ring 34 is welded or otherwise secured to the upper portion of the section 29 and has a tongue or flange 35 freely overhanging the upper portions of the springs 30 to prevent their displacement from the grooves 33. The circumferentially spaced springs 30 are adapted to centralize and guide the bailer as it is run through the well. A tubular cage 36 is threaded or otherwise secured to the upper portion of the section 29 and is adapted to be entered in the lower end of the body section 18. The cage 36 is adapted to extend some distance upwardly into the body section 18.

The invention provides a simple, dependable, releasable connection between the cage 36 and the body section 18 that permits the removal of the assembly A from the body 10 when it is desired to dump the bailer, clean the bailer, etc. The releasable connection between the assembly A and body 10 includes a plurality of circumferentially spaced lugs or splines 37 on the exterior of the cage 36. The splines 37 are adapted to be passed upwardly through grooves 38 in the interior of the body section 18 and entered in the recess 20. The splines 37 are passed up-

wardly through the grooves 38 into the recess 20 and the section 29 is given a partial rotation relative to the body section 18 to latch or retain the splines 37 in the recess 20. A plurality of circumferentially spaced openings 39 is provided in the cage 36. The openings 39 may be provided in the splines 37. A latch spring 40 is secured in a groove 41 in the exterior of the body section 18 and carries a latch pin 42. The pin 42 is adapted to pass through an opening 43 in the wall of the body section 18 and enter one of the openings 39. The latch pin 42 cooperating with the openings 43 and 39 dependably prevents rotation of the assembly A relative to the body 10 and thus prevents the entrance of the splines 37 into the grooves 38. A notch 44 may be provided in the exterior of the body section 18 at the free end of the latch spring 40 to facilitate the easy manipulation of the spring. The longitudinal edges of the splines 37 may be beveled so the pin 42 may be made to snap in one of the openings 39 when the splines are turned into the recess 20 as described above. When removing the assembly A, the spring 40 may be manually flexed outwardly to disengage the pin 42 from the opening 39 whereupon the assembly A may be given a partial rotation relative to the body 10 to bring the splines 37 into alignment with the grooves 38 to permit the disengagement of the assembly A from the body 10. If desired a packing washer 45 may be interposed between the lower end of the body section 18 and the upper ends of the ring 34 and the section 29.

The inlet valve means 12 is included in the assembly A to be removable from the body 10 together with the other parts of the assembly. The valve means 12 is provided to control the admission of the well fluids into the lower end of the body 10. It is an important feature of the invention that the valve means 12 is capable of dependable operation under very high hydrostatic well pressures and cannot open prematurely under such pressures. The valve means 12 includes a shiftable or floating valve seat 48 and a valve head or valve 49 for cooperating with the seat. The seat 48 is an annular or tubular member and is shiftable longitudinally in the body section 18 below its shoulder 19. The seat 48 may carry a guide 50 and a sealing rubber 51 may be clamped or held between the seat and guide 50 to slidably seal with the interior of the body 18. The upper end of the seat 48 is provided with a tapered seating surface 52. The upper end of the seat 48 may under certain circumstances contact the shoulder 19 which definitely limits the upward movement of the seat.

The valve 49 may be a simple disc-like member having a downwardly and inwardly tapered periphery. A valve rubber 53 is suitably recessed in the periphery of the valve 49 to seal against the seat 52. The valve 49 is carried by a stem 54 which extends downwardly through the body section 18 into the cage 36. The valve 49 may be threaded on the stem 54 and may be secured in position by a lock nut 55. The guide 50 on the seat 48 may assist in guiding the valve stem 54. The lower portion of the valve stem 54 is enlarged and stepped to present two upwardly facing shoulders 56 and 57. The shoulder 56 is preferably inclined downwardly and outwardly. When the valve 49 is in cooperation with the seat 48 the lower end of the fluid containing space of the body 10 is closed.

The control 13 for the valve means 12 operates to normally hold the valve 49 closed against the

seat 48 and is releasable upon engaging and pressing a part of the control against the bottom of the well to permit opening of the valve under the action of the hydrostatic pressures. The control 13 is in the nature of a latch control and includes a plurality of latches 58 for cooperating with the shoulder 56 on the valve stem 54. The latches 58 have their outer upper portions received in slots 59 in the wall of the cage 36 and are pivotally supported by pins 60. The latches 58 project downwardly and inwardly from the slots 59 and have shoulders 61 adapted to cooperate with the shoulder 56 to hold the valve stem 54 against upward movement. The latches 58 project upwardly and outwardly beyond the pivot pins 60 and their upper ends are in the nature of cams 62.

Spring means is provided to normally hold the latches 58 in proper cooperation with the shoulders 56. A shiftable thrust ring 63 is provided in the body section 18 at the upper end of the cage 36 and cooperates with the cams 62. A spring 64 is arranged under compression between the guide 50 and the ring 63 to urge the ring downwardly against the cams 62. The spring urged ring 63 acting on the cams 62 yieldingly holds the latches 58 in positions where their shoulders 61 properly cooperate with the shoulder 56 to positively hold the valve 49 against upward movement. The spring 64 acting upwardly against the guide 50 of the valve seat 48 urges the valve seat surface 52 into sealing contact with the valve rubber 53. Thus the spring 64 assures the proper cooperation of the latches 58 with the shoulder 56 to prevent upward movement of the valve 49 and holds the valve seat 48 upwardly in proper cooperation with the valve 49.

The control 13 further includes means for releasing the latches 58 to allow the valve 49 to open or move upwardly under the hydrostatic pressures in the well. The means for effecting the release of the latches 58 includes a sleeve 65 shiftable on the enlarged lower portion of the valve stem 54. The sleeve 65 has a slack connection with the stem 54. A pin 68 on the sleeve 65 shiftablely operates in a longitudinal groove 69 in the stem 54 and is adapted to engage the upper end of the groove to limit upward movement of the sleeve relative to the stem 54. An internal shoulder 70 is provided on the sleeve 65 and is adapted to cooperate with the shoulder 57 to limit the downward movement of the sleeve relative to the stem 54. A cushion washer may be provided between the shoulders 57 and 70 and a relief port 65^a may be provided in the wall of the sleeve 65. The latches 58 have downwardly and outwardly inclined surfaces 71 in their lower ends and the upper end of the sleeve 65 is rounded to cooperate with the surfaces 71 to effect outward pivoting of the latches 58 and disengagement of the latch shoulders 61 from the shoulder 56.

A longitudinally shiftable stem or plunger 72 extends through the section 29 and has a tubular guide 73 threaded on its upper portion. The guide 73 is threaded into the lower portion of the sleeve 65 and serves to connect the sleeve 65 and the plunger 72. The guide 73 may have guide fingers 74 shiftablely operating on the internal wall of the section 29 to centralize and guide the plunger 72. An upwardly facing annular shoulder 75 may be provided on the interior of the section 29 to limit the downward movement of the fingers 74 and the plunger 72. A spring 76 is provided within the sleeve 65 and is arranged under compression between the lower end of the

valve stem 54 and the upper end of the guide 73 to yieldingly hold the sleeve 65 and the plunger 72 in a "down" position where the sleeve is out of cooperation with the latch surfaces 71. The plunger 72 projects downwardly beyond the lower end of the section 29 and its projecting end portion may carry a dart or head 78 for engaging the bottom wall of the well bore.

When the bailer is to be run into the well the parts are assembled as illustrated in Figs. 1, 2, 3, 5, 6 and 7 of the drawings. In assembling the bailer the assembly A is adapted to be handled as a unit. The latches 58 may be latched to have their shoulders 61 cooperate with the shoulder 56 to maintain the valve 49 in its proper relation in the seat 48. In assembling the assembly A on the body 10 the valve means 12 and the cage 36 are inserted in the lower end of the body section 18 to move the splines 37 through the grooves 38. The assembly is then given a partial rotation relative to the body 10 to bring one of the openings 39 into register with the opening 43 whereupon the latch pin 42 snaps into the said opening 39. The latch pin 42 holds the assembly A against turning relative to the body 10 so that the splines 37 are held in the groove 20 where they are out of alignment with the grooves 38. The bailer is then secured to the cable or string and is lowered into the well.

During the passage of the bailer through the well the valve 49 operates to close the lower end of the hollow body 10 to prevent the entrance of fluid into the body. Under certain circumstances there may be a very heavy hydrostatic pressure in the well which may tend to open the valve 49. These hydrostatic pressures in the well may operate to cause upward shifting of the valve 49. Very heavy pressures on the valve 49 may result in elongation of the stem 54 and other parts to cause upward movement of the valve 49. This upward movement of the valve 49 is accompanied by corresponding upward movement of the valve seat 48. The surfaces of the valve seat assembly and the valve 49 exposed to the hydrostatic well pressures are related so that the seat 48 may move as rapidly or more rapidly than the valve 49 so that the valve 49 and seat 48 remain in proper cooperation to effect a positive seal. Due to this action of the floating valve seat 48 and the valve 49 the valve 49 is not unseated or opened by the hydrostatic pressures in the well.

When the bailer has reached the lower end of the well the head 78 may engage the material or formation at the bottom of the well. When the head 78 is in engagement with the bottom of the well continued downward movement of the bailer operates to release the latches 58. Engagement of the head 78 with the bottom of the well of course holds the plunger 72 against downward movement. Accordingly, as the bailer is moved downwardly the faces 71 of the latches 58 come into contact with the upper end of the sleeve 65 which is secured to the upper end of the plunger 72. This engagement results in pivoting of the latches 58 to release their shoulders 61 from the shoulder 56. Immediately upon the release of the latches 58 from the shoulder 56 the hydrostatic pressure acting on the valve 49 opens or raises the valve. The interior of the body 10 becomes filled or partially filled with the fluid under pressure in the well.

Following the loading or filling of the bailer it is raised or moved upwardly. This upward movement of the bailer is accompanied by closing of the valve 49. The weight of the fluid

trapped in the bailer body 10 of course holds the valve 49 in its closed position. When the bailer has been withdrawn from the well it is lowered into a suitable holding receptacle and the latch spring 48 is flexed outwardly to release the pin 42 from the opening 39. The body 10 is then turned slightly to align the grooves 38 with the splines 37 so that the body 10 and the assembly A may be moved apart. It will be understood that the assembly A is removable from the body 10 as a single unit. The contents of the bailer are immediately ejected upon the disconnection of the body 10 and the assembly A. The several parts comprising the assembly A may be readily washed off with a hose and the interior of the body 10 may be flushed out by fluid introduced through the opening 27. The assembly A may then be reconnected with the body 10 in the manner described above to again condition the bailer for operation.

The fluid bailed from the well or obtained in the body 10 may contain a large amount of cuttings, sand and mud and other solid matter which may cause it to tightly pack in the body. When this occurs it may be found desirable to employ hydraulic pressure to remove or discharge the material from the body 10. The plug 28 may be unthreaded from the opening 27 and a fitting 80 may be threaded in the opening. The fitting 80 is connected with the end of a hose 81 adapted to carry water or other fluid under pressure. The fitting 80 is provided with a port 82 which is adapted to discharge into the body 10 when the fitting is properly threaded in the opening 27. The fitting 80 is provided with means for preventing the escape of the hydraulic pressure from the relief valve 11. A suitable gasket 83 is secured to the inner end of the fitting 80 and is adapted to seal against the inner end of the valve body 21. When the fitting 80 is properly threaded in the opening 27 the gasket 83 seals against the valve body 21 to prevent the escape of the hydraulic pressure from the relief valve 11. After the fitting 80 has been threaded in the opening 27 water or other fluid under pressure may be passed through the hose 81 to discharge from the port 82. This fluid under pressure operates to force or discharge the well material from the body 10 and may fully flush out the body.

Having described only a typical preferred form and application of my invention I do not wish to be limited or restricted to the specific details herein set forth, but wish to reserve to myself any variations or modifications that may appear to those skilled in the art or fall within the scope of the following claims:

Having described my invention, I claim:

1. A well bailer comprising, a body to be run into the well to receive fluid, valve means for controlling the admission of fluid to the body including, a valve seat shiftable in the body, a valve for engaging with the seat and sealing against the hydrostatic pressures in the well, a releasable means for holding the valve closed, the seat being shiftable by the hydrostatic pressures to follow the valve in the event the said releasable means is distorted by the hydrostatic pressures on the valve to allow shifting of the valve, and means for releasing the said releasable means, the last mentioned means including a shiftable part projecting from the body to engage the bottom of the well and engageable with the said releasable means to release the same up-

on downward movement of the body when said part is engaging the bottom of the well.

2. A well bailer comprising, a body to be run into the well to receive fluid, valve means for controlling the admission of fluid to the body including, a valve seat shiftable in the body, a valve sealing downwardly against the seat, the surface of the seat exposed to the hydrostatic pressures in the well being at least as large as the surface of the valve exposed to such pressures whereby the hydrostatic pressures urge the seat upwardly against the valve, and a stem on the valve, releasable latch means engaging with the stem to hold the valve closed, and means for releasing the latch means to allow the valve to open under the action of the hydrostatic pressures, the last mentioned means including a member shiftable carried by the stem, engageable with the bottom of the well and engageable with the latch means to release the same when the stem moves downwardly with the body and relative to said member when said member is in engagement with the bottom of the well.

3. A well bailer comprising, a body to be run into the well to receive fluid, valve means for controlling the admission of fluid to the body including, a valve seat shiftable in the body, a valve for engaging the seat and sealing against the hydrostatic pressures in the well, and a stem on the valve, latch means engaging with the stem to hold the valve closed, a single spring acting on both the valve seat and the latch means to urge the valve and valve seat into yieldable engagement and to yieldably hold the latch means latched, the valve seat being shiftable by the hydrostatic pressures to follow the valve in the event the stem is stretched or the latch means distorted by the pressures acting on the valve, and means for releasing the latch means to allow the valve to open.

4. A well bailer comprising, a body for receiving fluid open at its lower end, an assembly adapted to be handled as a unit comprising a tubular section, a valve carried by the section, a valve seat engaged by the valve and adapted to enter the body, a stem on the valve, releasable latch means engaging with the stem to hold the valve closed, and means operable through engagement with the bottom of the well for releasing the latch means including a rod projecting from the section to engage the bottom of the well and a part on the rod shiftable with respect to the stem and engageable by the latch means to release the same, and means removably securing the assembly to the body to have the seat fit the body.

5. A well bailer comprising, a body having a chamber with an inlet, and valve means to control the inlet of the chamber, the valve means comprising, a tubular valve seat freely shiftable vertically in the body at the inlet, a sealing surface on the upper end of the seat, the lower end of the seat being exposed to the hydrostatic pressures in the well, a valve for sealing downwardly against said surface, a stem on the valve having an upwardly facing shoulder, a latch on the body for engaging the shoulder to hold the valve down against the seat, yielding means holding the latch in engagement with the shoulder and urging the seat upwardly, and means for releasing the latch from the shoulder to allow the valve to open under the hydrostatic pressures.

6. A well bailer comprising, a body having a chamber with an inlet, and valve means to control the inlet of the chamber, the valve means

comprising, a tubular valve seat freely shiftable vertically in the body at the inlet, a sealing surface on the upper end of the seat, the lower end of the seat being exposed to the hydrostatic pressures in the well, a valve for sealing downwardly against said surface, a stem on the valve having an upwardly facing shoulder, a pivoted latch on the body engaging with the shoulder to prevent upward movement of the valve, and a member engageable with the bottom of the well bore and guided by the stem to engage the latch and release the latch from the shoulder when said member engages the bottom of the bore.

7. A well bailer comprising, a body having a chamber with an inlet, and valve means to control the inlet of the chamber, the valve means comprising, a tubular valve seat freely shiftable vertically in the body at the inlet, a sealing surface on the upper end of the seat, the lower end of the seat being exposed to the hydrostatic pressures in the well, a valve for sealing downwardly against said surface, a stem on the valve having an upwardly facing shoulder, a pivoted latch on the body engaging with the shoulder to prevent upward movement of the valve, a cam part on the latch, a spring urged member acting on the cam part to yieldingly hold the latch in engagement with the shoulder, and means conditioned through engagement with the bottom of the well bore for releasing the latch from the shoulder to allow the valve to open.

8. A well bailer comprising a body for receiving fluid, a valve means controlling the admission of fluid to the body and tending to open under the action of the pressure in the well and releasable means holding the valve means closed comprising two relatively movable parts, one a stem for the valve means, the other a member shiftable relative to the body and projecting downwardly beyond the body to engage the bottom of the well to be held against downward movement by engagement with the bottom of the well, a shoulder on the stem, a latch carried by the body and releasably engaging with the shoulder to hold the valve means closed, and a shoulder on said member engageable by the latch to effect release of the latch upon downward movement of the body and stem relative to said member when the member is against the bottom of the well.

9. A well bailer comprising a body for receiving fluid, a valve means controlling the admission of fluid to the body and tending to open under the action of the pressure in the well and releasable means holding the valve means closed comprising two relatively movable parts, one a stem

for the valve means, the other a member shiftable relative to the body and projecting downwardly beyond the body to engage the bottom of the well to be held against downward movement by its engagement with the bottom of the well, a shoulder on the stem, spring means yieldingly resisting relative movement between said parts, a latch carried by the body and releasably engaging with the shoulder to hold the valve means closed, and a shoulder on said member engageable by the latch to effect release of the latch upon downward movement of the body and stem relative to said member when said member is engaging the bottom of the well.

10. A well bailer comprising a body for receiving fluid, a valve means controlling the admission of fluid to the body and tending to open under the action of the pressure in the well and releasable means for holding the valve means closed comprising two relatively movable parts, one a stem for the valve means, the other a member shiftable relative to the body and projecting downwardly beyond the body to engage the bottom of the well to be held against downward movement by its engagement with the bottom of the well, a shoulder on the stem, a latch carried by the body and releasably engaging with the shoulder to hold the valve means closed, and a tube on said member shiftablely surrounding the stem and engageable by the latch to effect its release upon downward movement of the body and stem relative to said member when said member is engaging the bottom of the well.

11. A well bailer comprising a body for receiving fluid, a valve means controlling the admission of fluid to the body and tending to open under the action of the pressure in the well and releasable means for holding the valve means closed comprising two relatively movable parts, one a stem for the valve means, the other a member shiftable relative to the body and projecting downwardly beyond the body to engage the bottom of the well to be held against downward movement by its engagement with the bottom of the well, a shoulder on the stem, a latch carried by the body and releasably engaging with the shoulder to hold the valve means closed, a tube on the upper end of the said member shiftablely surrounding the stem, and a cam face on the latch engageable with the tube to release the latch upon downward movement of the body and stem relative to said member when said member is engaging the bottom of the well.