This invention relates to a sand bailer device and is particularly, though not exclusively, adapted for cleaning the sand and mud from the bottom of oil and salt wells.

Another important object of the invention is to provide a deep well bailer which loads automatically at the bottom of the well, and also unloads itself when brought to the top of the well.

Another object of the invention is to provide a simple yet effective means by which the slush at the bottom of a deep well can be forced into a container and when brought to the top the pressure which has been accumulated and locked in the bailer while at the bottom of the well can be used to unload the bailer at the top.

A further object of the invention is to provide a generally improved bailer of the character mentioned which is strong, durable, economical in operation and reliable in use.

Another object of the invention is to provide a bailer unit, capable of doing the abovementioned work with no intricate valves or working parts, and which eliminates much danger of accidents as it is released from the top of the bailer and not the foot.

Other objects and advantages of the invention will become apparent from the following description taken in connection with the accompanying drawing in which Figure 1 is a vertical cross-section of the bailer when empty and ready to load. Dotted lines show the foot valve open as when loading. Figure 2 is a vertical cross-section of my bailer showing the position of the piston and head latch when the bailer is loaded. Figure 3 is a section taken at line 3—3 Fig. 1; Figure 4 is a section taken at line 4—4 Fig. 4; Figure 5 is a section taken on line 5—5 Fig. 2.

Referring to the drawing, the numeral 6 refers to the body of the bailer, the stem 1 in which an eye 8 is formed at the top and a valve 9 on the bottom extends through body 6, a shoe 10 screwed onto the lower end of body 6 at 20 has a downward facing valve seat 11 formed on its inner wall for the valve 9 to seat on, and a pressure regulating valve 12 is screwed into the head 13. Head 13 is screwed into the body 6 as shown at 21, and a latch 14 movably mounted on the head 13 is operated through the trigger 15 by the piston 13 when the piston reaches the top of the bailer to engage under a downward facing shoulder on the eye part to lock the valve 9 in closed position. Stuffing boxes 16 and 17 prevent the leakage of fluid pressure past the piston and the head.

In operation, when the drilled well has become sanded or mudded up, the bailer is connected to the sand line and lowered into the well, the bailer being empty as in Figure 1 with piston 13 at the bottom of bailer body 6, valve 9 closed against valve seat 11 and with packing rings 19 on piston 13 and stuffing boxes 16 and 17 all in operative sealing position the bailer cylinder body 6 having been filled with air at atmospheric pressure at the surface. The bailer continues downward until the bottom is reached, whereupon by the submerging of the shoe 10 in the mud at this time the descent of the bailer body ceases, and the weight of the stem 7 with the slack of the sand line pushes the foot valve 9 open. The hydrostatic pressure in the bottom of the hole being much greater than the atmospheric pressure in the body 6 above piston 18, forces the piston 18 upwardly, compressing the air in the space above the piston 13 and forcing the sand and mud into the container bailer body 6 until it is filled and the piston 18 reaches the top whereupon sets the latch 14 by pushing up against the trigger 15 located in head 13 to lock the valve 9 in closed position. It is noted that in loading the bailer, the bailer can be raised and lowered in a sloshing or stirring-up motion without locking the valve through the actuation of trigger 15, even though each time the bailer is raised the valve 9 contacts the seat 11 until the body container 6 is filled and piston 18 having moved to the top of body 6 actuates trigger 15 to operate latch 14 and lock the valve 9 in closed position, and bailer can not be filled unless it comes to rest on mud solid enough to hold its weight.

The bailer body 6 is now filled and the piston forced to the top of body 6 and latch 14 set by the pressure of the piston 18 against the trigger 15 locking the valve stem 7 in a closed position and not allowing the sand and mud in body 6 container to escape when the bailer is raised to the surface owing to the greater pressure in the body cylinder 8 than the air pressure at the top of the hole. Pressure regulating valve 12 is set to retain fluid load at a suitable and safe pressure sufficient to force the piston 13 downwardly cleaning the lower end of the chamber of its load of sand and mud when the trigger is manually tripped and allowing the foot valve 9 to open allowing the stated contents to be forced out. The bailer is now raised to the surface and unloaded and lowered into the hole to repeat the operation as many times as deemed necessary to complete the job.

While only one form of this invention has been shown and described herein, it will be understood...
that various modifications and changes may be resorted to without departing from the spirit of the invention or the scope of the following claims.

What is claimed is:
1. A hydrostatic pressure baler, comprising a barrel having a closed head at one end forming a collar, a valve controlling the other end of the barrel and opening outwardly, a valve stem in said barrel and attached to said valve, a floating means within said barrel slidably mounted upon the valve stem, said stem being connected at its lower end to said valve and extending slidably through and snugly engaging in said collar, suspending means on the upper end of said stem, the above mentioned floating means snugly engaging the inner walls of the barrel and separating the barrel into lower or intake chamber and closed upper or air chamber, said floating means being movable to vary the volumes of said chambers, caused by the necessity of equalizing the charging pressures in the said chambers when loading and unloading the baler.

2. A pressure operated baler having an inlet and outlet opening at its lower end with a downwardly facing valve seat in said opening, means for lowering said baler into the well and pulling it out comprising a rod extending slidably through the baler and attached at its lower end to a valve seating on said valve seat from below, a floating member slidably mounted on said valve rod within the baler and closely contacting the inner wall of the same, dividing the baler into upper air and lower charge chambers, of varying capacities, the upper end of the baler being closed by a head member forming a collar in which said valve rod is slidably mounted, a latch mechanism on the upper surface of said collar, said latch mechanism comprising an element for engaging a shoulder on said rod when the valve is in closed position, a latch actuating mechanism extending through said head member and actuable by the floating member upon upward movement of the floating member to urge said latch mechanism into locking position so that when the valve and rod are lifted after loading the baler the latch mechanism is moved by the actuating mechanism into latching relationship with the valve rod to lock the valve in closed position to entrap the load, said floating member being moved upwardly by the inrushing fluid when loading the baler.

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