

July 13, 1948.

P. T. BYNUM

2,445,206

BAILER

Filed Feb. 22, 1943

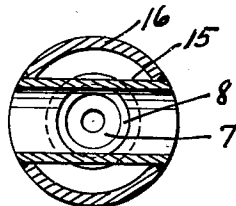
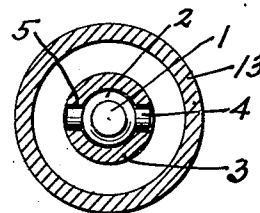
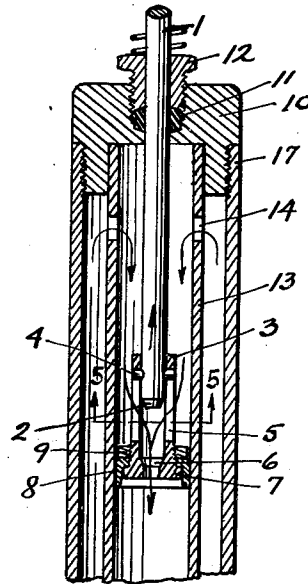
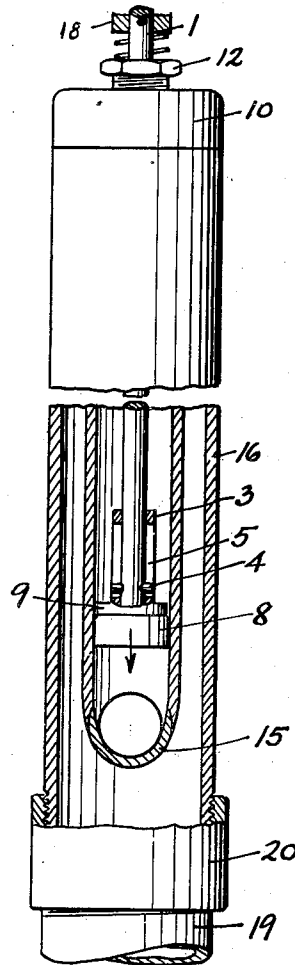
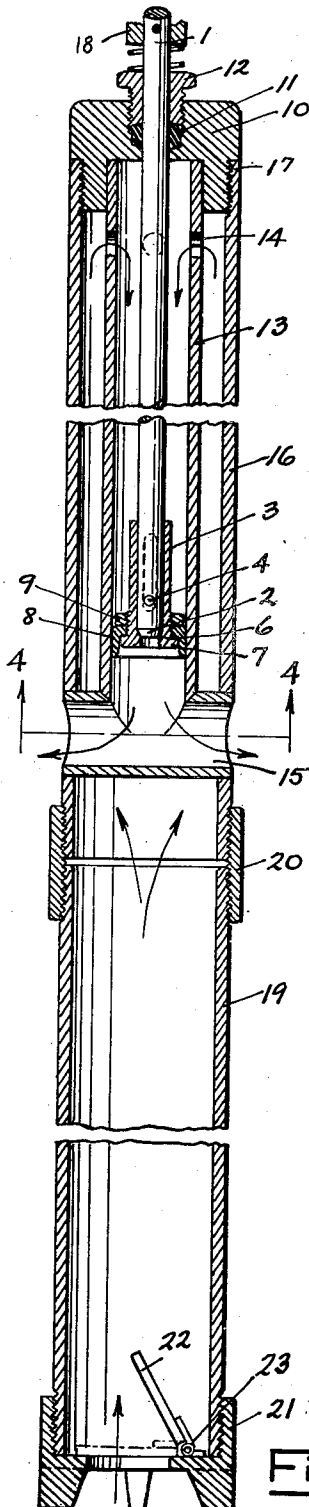


Fig. 4. *Pink T. Bynum.*
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2,445,206

BAILER

Pink T. Bynum, Beeville, Tex.

Application February 22, 1943, Serial No. 476,674

4 Claims. (Cl. 166—19)

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This invention relates to bailers and has for its general object the provision of a bailer which will operate more efficiently than have similar structures heretofore devised.

Bailers in the past have consisted principally of two types. One type has consisted of a closed hollow member having means whereby, when it has been lowered to the position where it is desired that it be filled, an opening in the member may be made by opening a valve or the like, whereupon the member is promptly filled by means of hydraulic pressure. Another type of bailer is one in which a cylinder is provided at its lower end with a valve and a piston is provided within the cylinder, the piston being connected through a piston rod or the like with means for suspending the entire device so that when the device has been lowered into place against the bottom of a hole or against some body of material with which it is desired that the bailer be filled, the suspension means may be lowered until the piston approaches the bottom of its travel and then sharply pulled upwardly. The inertia of the cylinder or hollow member is relied on to prevent it from moving upward immediately, and the upward movement of the piston produces a partial vacuum within the cylinder or the like and causes material to enter such cylinder through the valve at the lower end thereof.

Both of the types of bailers just referred to have failed to give complete satisfaction.

An object of this invention is to provide a bailer in which if the first intake action is insufficient, it may be repeated as many times as may be necessary to completely fill the device.

Another object of this invention is to provide a bailer in which the suction of material into the interior of the bailer may be caused while the entire weight of the bailer is resting upon the bottom of the hole.

Still a further object of this invention is to provide a bailer of such a nature that it may be "spudded" against the bottom of the hole simultaneously with the production of a suction into the bailer so that the bailer is filled at the same time that it is spudded.

One other object of this invention is to provide a bailer in which the body and intake of the bailer may actually be pressed against the bottom of the hole during the time that a suction is produced tending to draw material into the bailer.

Other objects and advantages of this invention will become apparent from the following description taken in connection with the accompanying

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drawing wherein one embodiment of this invention is set forth by way of illustration.

In the drawing:

Fig. 1 represents a longitudinal cross section through a bailer constructed in accordance with this invention.

Fig. 2 is a view partly in side elevation and partly in longitudinal cross section taken at right angles to the plane of Fig. 1 and showing the upper portion of the bailer illustrated in Fig. 1.

Fig. 3 is a longitudinal cross section through the upper portion of the bailer illustrated in Fig. 1 and illustrating the parts in the position which they occupy during the inactive or upstroke of the piston within the device.

Fig. 4 is a transverse cross section taken along the line 4—4 of Fig. 1.

Fig. 5 is a transverse cross section on an enlarged scale taken along the line 5—5 of Fig. 3.

Referring more in detail to the drawings, the numeral 1 indicates a piston rod, the upper end of which will be secured to a cable or other means for suspending the bailer. If desired this rod may be made of such proportions that it will have a substantial amount of weight, or separate weights may be secured to the rod for the purposes hereinafter stated.

The rod 1 has its lower end beveled as illustrated at 2 for the purpose of forming a valve member, and this lower end is telescoped within a sleeve like portion 3. It is held within this sleeve like portion by means of a pin 4 extending transversely through the rod 1 and having its ends disposed in slots 5 which extend along the opposite sides of the sleeve 3.

The lower tapered end 2 of the rod 1 is adapted to seat against a tapered valve seat 6 within the lower portion of the sleeve 3 so as to close the passage through this sleeve. The lower end of this sleeve 3 is provided with a laterally extending flange 7 forming the body of a piston. Surrounding the body of this piston just above the flange 7 is a packing cup 8 having its edges turned downwardly, and this packing cup is held in place by means of a nut 9 threaded on to the body 3 above the cup 8. The cup is thus clamped between the nut 9 and the flange 7.

Above the piston arrangement just described the rod 1 passes through a head 10, this head being provided with a stuffing box having packing 11 therein and the packing 11 is compressed about the rod 1 by means of a packing or gland nut 12.

Seated in a depression in the undersurface of the head 10 and extending downwardly there-

from is a small cylinder which may be referred to as a power cylinder 13 of a size to just receive the piston carried on the lower end of the rod 1. This cylinder 13 adjacent its upper end has laterally open ports 14, and at its lower end is secured by some suitable means to a transversely extending tubular member 15, so that it is in full communication with the interior of the tubular member 15. In this instance, the cylinder 13 is shown as being welded to the tubular member 15, but it will be understood that any other suitable means of joining these parts may be employed.

Also extending downwardly from the head 10 is a larger cylinder 16 forming a portion of the body of the bailer. This cylinder as illustrated is concentric with the cylinder 13 and is provided with lateral openings within which the outer ends of the tubular member 15 are secured. Thus the interior of the cylinder 13 is in communication at all times through the tubular member 15 with the exterior of the body member 16, and the upper end of the cylinder 13 is in communication at all times through the ports 14 with the interior of the body member 16.

The upper end portion of the cylindrical body member 16 is internally threaded to receive the head 10. This thread engagement is of such a nature that a sealing connection is provided between the cylindrical body 16 and the head 10.

Below the cylindrical body member 16 and forming a continuation thereof is a cylindrical receptacle 19 joined to the cylindrical body member 16 by means of a coupling 20 or the like. The lower end of this receptacle 19 which forms the lower part of the body of the device is closed by means of a shoe 21 having an opening therein closed by means of a downwardly closing flap valve 22. This valve 22 is pivotally mounted at 23 so that it may open in an upward direction to permit flow into the receptacle 19 but will close when such flow ceases.

Above the gland nut 12 the rod 1 may be provided with a sinker or weight member 18, and the downward movement of the rod may be limited by means of a cushion spring surrounding the rod below the weight member 18 in the position indicated in the drawing.

In operation, the device is lowered into a well or other locality from which it is desired to remove material by means of a bailer, the device being suspended during this time by means of a cable or the like secured to the upper end of the rod 1. Naturally during this period the body member 16 and all parts rigidly secured thereto will tend to slide toward their lowermost position with respect to the rod 1 thus leaving the piston on the rod 1 at the upper end portion of the cylinder 13. Likewise, the rod 1 will move upwardly with respect to the piston until the pin 4 comes in contact with the upper ends of the slots 5. The entire device will then be suspended upon the rod 1. During this time it will be seen that with the rod 1 in its uppermost position with respect to the piston, the way is left open for flow to take place through the piston as illustrated in Fig. 3. There is thus no hindrance to the movement of the rod 1 and the piston to their uppermost position with respect to the remainder of the device.

When the device reaches the bottom of the well or the like and the lower end of the receptacle 19 carrying the cap 21 comes in contact with such bottom, the downward movement of the body member will cease. Thereupon, the downward movement of the rod 1 with respect

to the remainder of the device will first move this rod 1 downwardly with respect to the piston until the tapered lower end 2 of this rod comes in contact with the seat 6 and closes the passage through the piston. Further downward movement of the rod and piston which will now move with the rod will partially evacuate the space above the piston. This space is directly connected through the openings 14 and the body member 16 with the interior of the receptacle 19, and this space within these members 16 and 19 will therefore likewise be partially evacuated.

It will be understood that this device is adapted for use in locations where there will exist a fluid pressure surrounding the device, and upon the partial evacuation just referred to this pressure on the outside of the device will force the valve 22 open and in entering the receptacle 19 will carry in with it trash and other solid matter such as sand or the like, thus partially or wholly filling the receptacle 19. Also, during the time that the piston is moving downwardly, the fluid which has been within the cylindrical member 13 below the piston will be forced out through the tubular member 15 to the space outside of the device. In the event there is a liquid surrounding the device, the liquid thus forced out through the tubular member 15 will tend to increase the pressure immediately adjacent the exterior of the device and will thereby accelerate and intensify the flow of liquid in through the lower end of the device past the valve 22. This naturally tends to increase the efficiency of the device in drawing materials in to the inside of the receptacle 19.

It will further be seen that if the receptacle 19 is not completely filled after one downward movement of the piston, and it probably will not be completely filled by a single downward movement of the piston, the piston may again be elevated by pulling on the suspending device attached to the rod 1. Such a pull will first lift the rod 1 with respect to the piston so as to open the passageway through the piston. When the pin 4 rises to the upper end of the slots 5 and comes in contact therewith, the piston will thereupon be pulled upwardly and during such upward pull fluid existing within the cylinder 13 above the piston may flow through the piston into the space below the piston. Thereupon, the operation may be repeated and the piston again lowered to draw additional material into the receptacle 19. This operation may be repeated as many times as desired until the entire space within the receptacle 19 and the body member 16 is filled with solid or semisolid material. The piston with its rod and valve, taken with the cylinder 13 thus form a single acting down stroke pump for evacuating fluid from the upper end portion of the debris receptacle 19 and the body member 16.

It will further be seen that during the operation of the device and particularly during the time when fluid is being drawn inwardly past the valve 22, the device will be held firmly against the bottom of the well or other position in which it may be operated. There would be no tendency to raise the device away from such bottom, and hence there will be all the more tendency for fluid entering the bottom of the device to carry with it such loose solid material as may be present.

It will further be appreciated that when the device is dropped against the bottom of a hole or the like the very force of impact will tend to cause the dislodgment of solid material which it is desired that the device take up and that imme-

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diately after the impact which thus may dislodge such material, the material will be washed directly into the receptacle 19 as the piston moves downwardly within the cylinder 13.

In view of all of the foregoing it will be seen that a device has been provided which is capable of carrying out and accomplishing all of the objects and advantages sought by this invention.

Having described my invention, I claim:

1. In a bailer, a hollow debris receptacle having an opening at its lower end, a barrel element within the receptacle, a piston element reciprocable in said barrel element for pumping fluid from the upper interior portion of said receptacle, one of said two last mentioned elements being secured to said receptacle, means for forcibly moving the piston element first in one direction and then in the other with respect to the barrel element when said receptacle is held stationary, and a one-way valve connecting the opposite ends of said barrel whereby said piston may move freely with respect to said barrel in one direction but not in the other, and laterally open ports in said barrel element providing communication between the interior of said barrel and the interior of said receptacle on one side of said piston.

2. In a bailer, a hollow debris receptacle having an opening at its lower end, pump means within and secured to said receptacle for pumping fluid from the upper interior portion of said receptacle and in communication with the interior thereof and operable to pump fluid through said receptacle while the full weight of said receptacle is resting on its lower end, said pump means including a piston and cylinder, said piston being downwardly movable with respect to said cylinder and with respect to said receptacle, and both of which are of smaller cross section than said receptacle, and a sinker in the form of a weight member carried by said piston for assisting the downward movement thereof.

3. In a bailer, a hollow debris receptacle having an opening at its lower end, a barrel smaller than and carried within said receptacle and having an opening above its lower end in communication with the interior of said receptacle and an open-

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ing below said second mentioned opening in communication with the exterior of said receptacle, a piston reciprocable within said barrel, means for forcing said piston downwardly a substantial distance below said first mentioned opening in the barrel, and means carried by said piston closed when the piston is being lowered and opened providing communication between the space within said barrel above said piston and that within the barrel below said piston when the piston is being raised relative to the barrel.

4. In a bailer, a hollow receptacle having an opening at its lower end, and a single acting pump barrel of smaller cross section than said receptacle and within the same, the upper end portion only of said barrel being open to the interior of said receptacle, means preventing communication between the lower end portion of said pump barrel and the interior of said receptacle and providing communication between the lower end portion of said barrel and the exterior of said receptacle, a piston having a passage there-through mounted for reciprocation within said barrel, a rod connected to said piston and extending through the upper end thereof to the exterior of said receptacle whereby said piston may be reciprocated, and one-way valve means carried by said piston and rod for closing said passage on downward movement of said piston and opening it on upward movement of said piston.

PINK T. BYNUM.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,247,092	Dodds -----	Nov. 20, 1917
1,415,417	Trew -----	May 9, 1922
1,669,130	Jensen -----	May 8, 1928
2,050,289	Dunlap -----	Aug. 11, 1936
2,055,515	Yarbrough -----	Sept. 29, 1936
2,099,877	Westall -----	Nov. 23, 1937
2,141,672	Taylor -----	Dec. 27, 1938