SELF-DUMPING BAILER
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4 Claims. (Cl. 165—19)

1. The present invention relates to new and useful improvements in bailers for oil or other drilled wells and more particularly to a self-dumping bailer whereby plastics, slurry or other liquid may be discharged at a given depth in a bored hole for use in plugging wells and for other purposes where a bailer of this character is employed.

An important object of the present invention is to provide a self-dumping bailer which eliminates the necessity of providing a bridge or seat on which the valve of the bailer is tripped.

A further object of the invention is to provide a spring operated valve normally held in a closed position by means including a frangible hanger member adapted to be disintegrated by an explosive charge inserted therein and providing electrically controlled firing means for the charge whereby the bailer may be emptied by remote control from a point at the top of the well.

A still further object is to provide a device of this character of simple and practical construction, which is efficient and reliable in operation, relatively inexpensive to manufacture and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a side elevational view of the bailer shown in position in a well casing, the latter being shown in section.

Figure 2 is a vertical sectional view of the bailer.

Figure 3 is an enlarged fragmentary vertical sectional view taken on a line 3—3 of Figure 2, and showing the frangible hanger for holding the valve in a closed position.

Figure 4 is an enlarged fragmentary sectional view through the valve taken on a line 4—4 of Figure 2.

Figure 5 is a transverse sectional view taken on a line 5—5 of Figure 4, and

Figure 6 is an enlarged vertical sectional view of the frangible hanger showing the explosive charge therein.

Referring now to the drawings in detail and first wherein for the purpose of illustration I have disclosed a preferred embodiment of the invention, the numeral 5 designates the bailer generally which includes a pipe section 6 having a bail 7 connected at its upper ends by a pipe union 8, the bailer being lowered into a well casing 9 by means of a sand line or cable 10 attached to the bail 7.

The pipe 6 constitutes the body of the bailer adapted to contain a suitable liquid to be placed in the casing at a desired depth and to the lower end of the pipe 6 is attached a sleeve 11 by means of a pipe union 12, the lower end having a cap 13 attached thereto by a pipe union 14.

A valve seat 15 is suitably carried in the upper portion of the sleeve 11, the valve seat facing downwardly and closed by a valve 16 in a manner to be more fully hereinafter described. The sleeve 11 is formed with perforations or discharge ports 17 closed by an inner sleeve 18 slidably mounted in the sleeve 11. The inner sleeve 18 is connected to the valve 16 by a link 19 and a coil spring 20 is connected at its upper end to the inner sleeve 18 by means of a link 21 while the lower end of the spring is connected to the bottom of the cap 13 in a suitable manner.

A cable 22 is attached at its lower end to the valve 16 and extends upwardly through the pipe 6 with its upper end provided with a link 23 attached to an eye 24 on the bottom of a frangible casing 25, the casing being constructed of upper and lower threadedly connected sections 26 and 27.

An eye 28 is carried by the upper section 26 of the casing and is connected by a link 29 to the lower end of a toothed bar 30 slidably mounted in a guide 31 carried within the ball 7, the bar being secured in vertically adjusted position by means of a dog 32 engaging the teeth of the bar and pivoted to an ear 33 on the guide 31.

By adjusting the bar 30 in the guide 31 the valve 16 may be held tightly closed against the valve seat 15 through the connection of the bar with the valve by the cable 22 and casing 25 which functions as a frangible hanger for the cable.

A loose cable 34 connects the link 23 directly to the link 29 by-passing the casing 25.

The casing 25 holds a suitable explosive charge 35 contained in a bag 36 and through which an electric wire 37 extends. The lower end of the wire 37 is grounded to the bottom of the casing as at 38 and the upper end of the wire is provided with a contact 39 engaging a contact 40 carried by an insulation member 41 suitably secured in the upper portion of the casing 25.

An electric wire 42 leads from the contact 40 through an insulated waterproof nipple 43 in the top of the casing to a cable 44 in which the sand
line 10 is also carried for connecting the wire 42 to a suitable source of current. The wire 37 in the charge 35 is of suitable resistance to become hot when current is passed therethrough whereby to set off the charge. According to the operation of the device, the body 5 of the baller is filled with a suitable liquid for its intended purpose and the baller is lowered in the well casing 9 to a desired depth and the charge 35 is set off wherein the casing 29 will be broken, releasing cable 22 and valve 16 which is moved downwardly into its open position by spring 28. The spring also lowers the inner sleeve or valve 18 to uncover or open the port 17 and the liquid from the baller is then discharged into the well. The loose connecting cable 33 between cable 22 and the bar 30 facilitates closing the valves 16 and 18 and connecting a fresh releasing charge and casing 29 in position for subsequent use of the device.

In view of the foregoing description taken in conjunction with the accompanying drawings it is believed that a clear understanding of the construction, operation and advantages of the device will be quite apparent to those skilled in this art. A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and the scope of the appended claims.

Having described my invention, what is claimed as new is:

1. A baller for wells comprising a hollow body having a discharge port therein, means for lowering said body into a well, a valve in said body adapted to be opened and closed to control discharge from said port, spring means in said body for opening said valve, a frangible hanger member suspended from said body, means connecting said valve and member to hold said valve closed in opposition to said spring means until said member is fractured, flexible means connecting said valve to said member to hold said valve closed until said member is fractured, said flexible means being released by fracture of said member to permit said valve to open, a slack cable connection between said flexible member and body by-passing said frangible member and connecting said flexible member when released to said body, and remote control means for fracturing said member at will.

2. A baller for wells comprising a hollow body having a discharge port therein, means for lowering said body into a well, a valve in said body adapted to be opened and closed to control discharge from said port, spring means in said body for opening said valve, means for holding said valve closed in opposition to said spring comprising a frangible hanger member connected to said body, and a cable attached to said member and to said valve and adapted to be released when said member is fractured, permits said valve to be opened by said spring means, and remote control means for fracturing said member at will.

3. A baller for wells comprising a hollow body having a discharge port therein, means for lowering said body into a well, a valve in said body adapted to be opened and closed to control discharge from said port, spring means in said body for opening said valve, means for holding said valve closed in opposition to said spring comprising a frangible hanger member, means suspending said member from said body, a cable attached to said member and to said valve and adapted to be released when said member is fractured to permit said valve to be opened by said spring means, remote control means for fracturing said member at will, said means suspending said member including a slidably mounted rack and a dog for said rack operative for adjusting said member to tighten said cable and tightly close the valve.

4. A baller for wells comprising a hollow body having a discharge port therein, means for lowering said body into a well, a valve in said body adapted to be opened and closed to control discharge from said port, spring means in said body for opening said valve, means in said body for holding said valve closed in opposition to said spring means comprising a frangible member suspended from said body and adapted to be fractured, flexible means connecting said valve to said member to hold said valve closed until said member is fractured, said flexible means being released by fracture of said member to permit said valve to open, a slack cable connection between said flexible member and body by-passing said frangible member and connecting said flexible member when released to said body, and remote control means for fracturing said member.

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