

Feb. 25, 1941.

A. BOYNTON

2,232,688

CEMENT DUMP BAILER

Filed Nov. 28, 1938

2 Sheets-Sheet 1

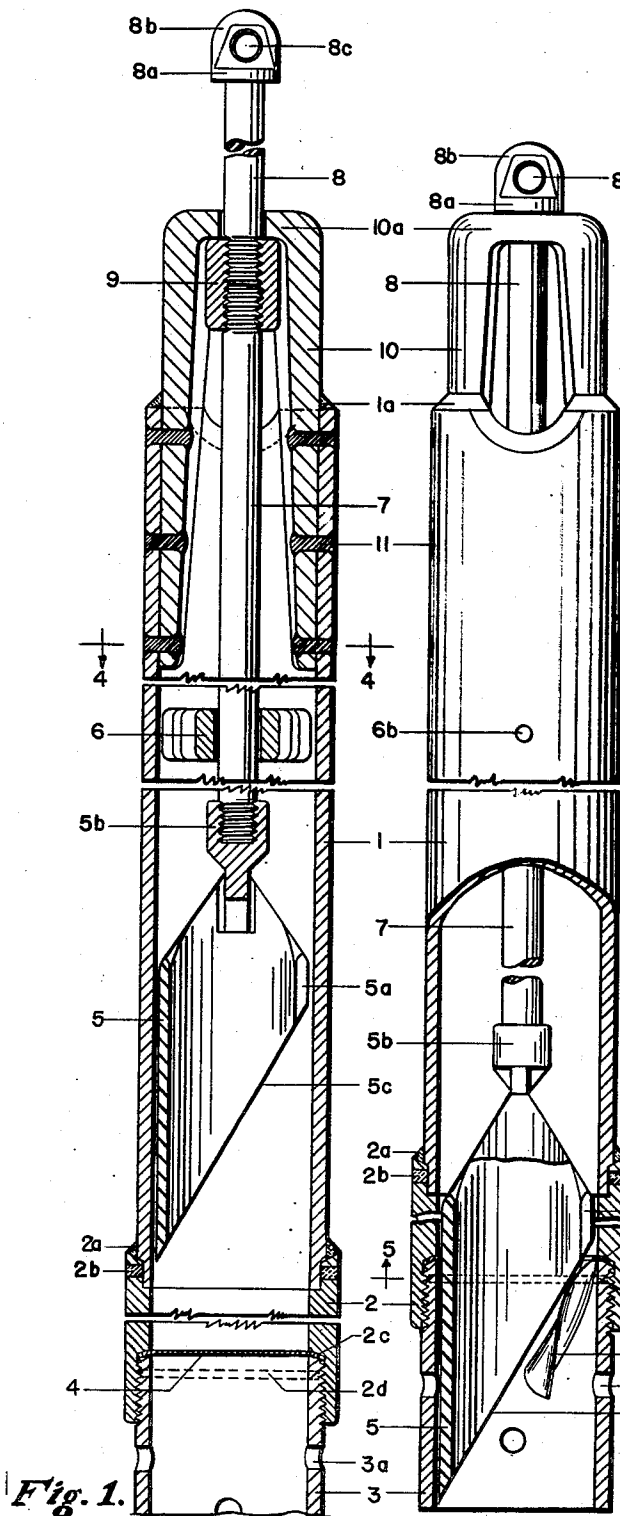
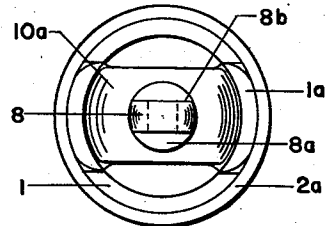


Fig. 3.

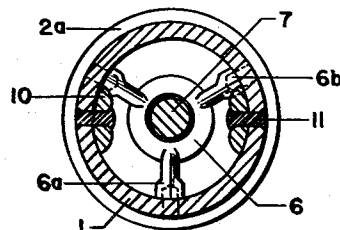


Fig. 4.

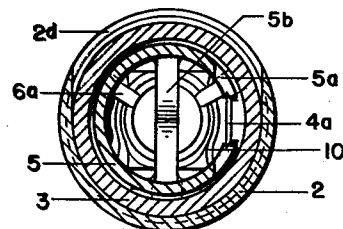


Fig. 5.

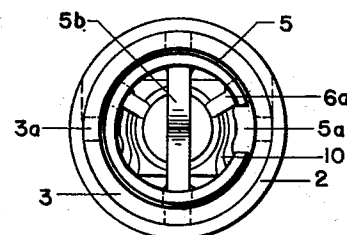


Fig. 6.

ALEXANDER BOYNTON,

INVENTOR,

BY *Jesse R. Stone*
Lester D. Clark
ATTORNEYS.

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A. BOYNTON

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2 Sheets-Sheet 2

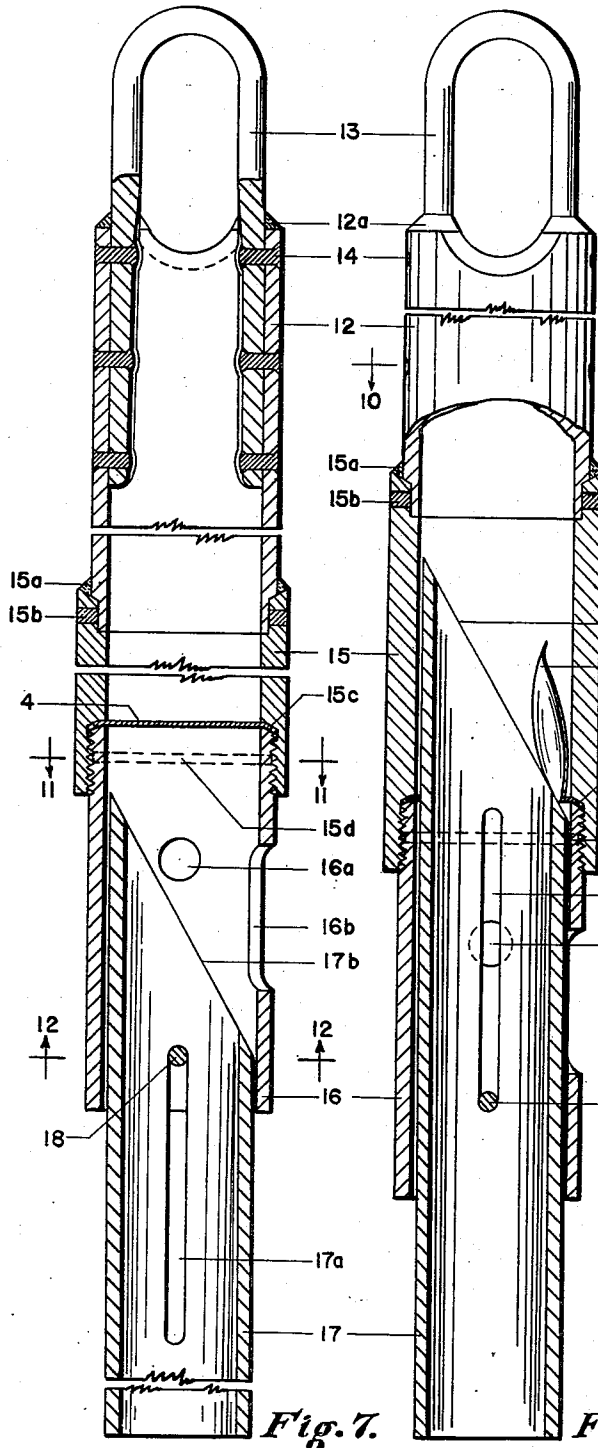
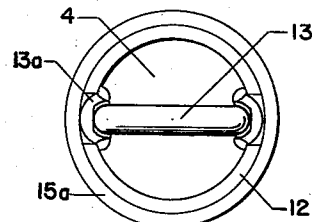


Fig. 9.

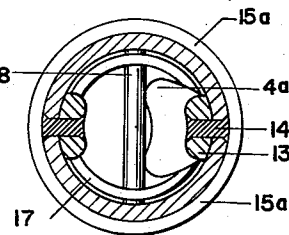


Fig. 10.

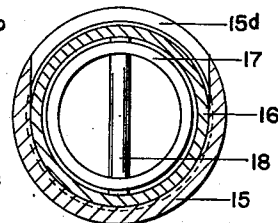


Fig. 11.

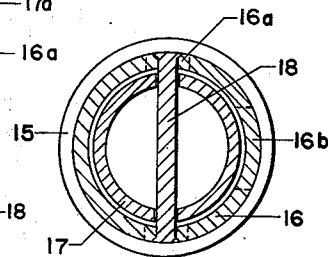


Fig. 12.

ALEXANDER BOYNTON,

INVENTOR

BY

Jesse H. Stone
Dexter B. Clark
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,232,688

CEMENT DUMP BAILER

Alexander Boynton, San Antonio, Tex.

Application November 28, 1938, Serial No. 242,777

13 Claims. (Cl. 166—19)

My invention relates to dump bailers for depositing cement, acid solutions, and other liquids or semi-liquids in wells.

I do this by employing a tubular container 5 which is filled proximate the ground surface with the substance to be dumped, and then lowering the bailer to the bottom of the well, or to an obstruction placed in the well, where it is desired to dump the bailer. The contents of the 10 bailer is held in the bailer by a thin disc until the bailer lands at which time a shaft, having a cutter attached to its bottom end, cuts the disc open and releases the contents of the bailer, as will be apparent in the accompanying drawings in 15 which—

Fig. 1 is a longitudinal section of the bailer with the cutter in the upper position.

Fig. 2 is a partial elevation of the bailer, the lower portion being in longitudinal section, 20 showing the cutter in the lower position.

Fig. 3 is a top end view of the bailer shown in Figs. 1 and 2.

Fig. 4 is a section on the line 4—4, Fig. 1.

Fig. 5 is a section on the line 5—5, Fig. 2.

Fig. 6 is a bottom end view of the bailer shown in Fig. 1 with disc 4 removed.

Fig. 7 is a longitudinal section of a modified form of the bailer showing the cutter in the lower position.

Fig. 8 is mainly a longitudinal section of the bailer in Fig. 7 showing the cutter in the upper position.

Fig. 9 is a top end view of the bailer shown in Figs. 7 and 8.

Fig. 10 is a section on line 10—10, Fig. 8.

Fig. 11 is a section on line 11—11, Fig. 7.

Fig. 12 is a section on line 12—12, Fig. 7.

Similar characters refer to similar parts throughout the several views.

My bailer includes an outer housing formed 40 by a tubular shell 1 which has the tubular extension 2 secured upon its lower end by means of welds 2a and 2b. The circular shoulder 2c engages a circular disc 4 by means of bottom nipple 45 3 having threaded engagement with tubular extension 2. The openings 3a provide that a rod or crow bar may be employed to screw bottom 3 upward or downward.

To place the disc 4 in the position shown in 50 Fig. 1, a slot 2d is formed in one side of extension 2 as seen in Fig. 5. The bottom nipple 3 is screwed downward until its upper end is somewhat below the slot 2d. The length of this slot should be the same as the minor diameter of the 55 threads at its either end, and the width of the slot

should be such as will conveniently admit the disc. The disc 4, which should be of the same, or slightly less diameter than the minor diameter of the adjacent female threads in extension 2, is then inserted through the slot and the nipple 3 is screwed upward until the disc is locked against the shoulder 2c. The disc should preferably be thin tin or the like, and may be preformed to conform to the shoulder against which it is locked.

The cutter shell 5, having a longitudinal opening 5a, is threadedly joined to a shaft 7 by means of connection 5b. The sloping lower end 5c is adapted to cut the disc 4 when engaged therewith as will be later explained.

The shaft 7 is freely movable through guide 6 having arms 6a secured to shell 1 by welds 6b, (Fig. 4). This shaft is threadedly joined to extension 8 by means of coupling 9. Extension 8 has a circular enlargement 8a and an upper flat 20 portion 8b through which an opening 8c is adapted to receive a cable by which the bailer may be manipulated in the well.

The bail 10, having a platform portion 10a, is secured upon shell 1 by rivets 11 and weld 1a.

The coupling 9 is positioned to land under the platform 10a when the lower end of cutter shell 5 is somewhat above the disc 4 (preferably 1 to 3 feet above it). The enlargement 8a is adapted to land upon this platform when the lower sloping 30 shank edged end of cutter shell 5 has wholly passed through the disc 4. Nipple 3 should be of such length as to not allow the lower sloping end of shell 5 to pass below it, in order to protect the cutting surface of the shell from possible damage 35 when the bailer dumps.

When the bailer is suspended in the well by means of a cable attached through opening 8c, coupling 9 will engage under platform 10a as appears in Fig. 1. This figure shows the relative 40 position of all parts while the bailer is loaded or ready to be loaded.

When the bailer reaches the bottom of the well, or wherever a landing may be provided, the enlargement 8a arrests the downward travel of 45 shafts 7 and 8 and cutter shell 5, as appears in Fig. 2. This figure shows the relative position of all parts while the bailer is unloading or resting on bottom after disc 4 has been cut.

When the bailer is withdrawn from the well, 50 all parts are in the position shown in Fig. 1 except the disc will be cut as shown at 4a, Fig. 2. The nipple 3 will then be screwed downward until the window slot 2d is uncovered. The cut portion 4a then affords a ready means by which the used 55

disc may be removed and a new disc inserted as hereinbefore described.

It will be observed that there are two complete threads shown in tubular extension 2 above the slot 2d. Two or more threads above this slot provide that the member 2 will not be bent or distorted below the slot when nipple 3 firmly engages the shoulder 2c.

The fact that bottom nipple 3 does not have to be wholly removed in order to insert the discs 4 avoids the danger of dropping this nipple into the well and greatly facilitates the speed with which the bailer may be used.

Figs. 7, 8, 9, 10, 11, and 12 illustrate a modified form of the invention in which the bailer shell 12 is shown fastened to a bail 13 by a weld 12a and rivets 14. The lower end of the shell 12 is preferably turned down somewhat and pressed into the upper end of tubular extension 15, the engagement being secured by welds 15a and 15b. Bottom nipple 16 has threaded engagement with tubular extension 15, and these two parts engage the metallic disc 4 in the same manner as was described in the preceding form of the invention. The pin 18, having slight clearance within the slot 17a, governs the travel of cutter shell 17 which is freely slidable within the nipple 16.

The bailer may be filled by pouring liquid cement into the open upper end. The cement will be held within the bailer by disc 4 as was explained in the preceding form of the invention. Gravity will normally hold the cutter 17 in the position shown in Fig. 7. When the bailer lands on bottom of the well, or whenever a landing may be provided, the cutter shell 17 will be forced upward by the weight and impact of the bailer causing the cutting slope 17b to cut the disc 4 as appears in Fig. 8.

The openings 16a, through which a bar may be inserted, are for convenience of screwing the nipple 16 in or out.

The hand hole 16b in the nipple is for convenience of the operator in removing the cut disc 4 after the bailer is removed from the well, and nipple 16 has been partially unscrewed. Another disc may be inserted through the slot 15d and locked against the shoulder 15c as was explained for the similar operation in the first form of the invention.

Many types of valves have been devised for dumping cement in wells, but the idea of dumping a bailer by cutting out the bottom is believed to be new and more certain in operation.

Manifestly, the construction herein shown, by way of illustration and example, may be greatly varied within the scope and purpose of this invention.

I claim:

1. A dump bailer including a tubular shell, a comparatively thin disc closing the lower end thereof, an arcuate cutter fitting slidably within said shell, means to support said bailer and acting also to hold said cutter positioned above said disc, and means extending in advance to engage an obstruction and support said shell.

2. A dump bailer including a tubular shell, a metal disc closing the lower end of said shell, a cutter above said disc, means to support said cutter above said disc, said cutter operating by gravity to shear said disc, when released by said supporting means.

3. A dump bailer including a tubular shell, a metal disc closing the lower end of said shell, a cutter above said disc, means to support said cutter above said disc, including a rod extending

upwardly through said shell to engage a cable, means at the lower end of said shell to engage an obstruction and support said shell, said rod and cutter being releasable to fall by gravity and shear said disc.

4. A dump bailer for wells including a shell, a bail thereon, a disc closing the lower end of said shell, a cutter slidable relative to said disc, said cutter comprising a circular hollow member having a beveled cutting edge and being brought into contact with said disc to cut the same when said bailer reaches a supporting obstruction in the well, and means including a lateral opening in said shell to insert a disc.

5. A dump bailer for wells including a shell, a bail thereon, a disc closing the lower end of said shell, a cutter slidable relative to said disc, said cutter being adapted to extend ahead of said bailer shell and moved into shearing contact with said disc when said cutter contacts with an obstruction in the well, said shell moves downwardly relative thereto, said cutter including a beveled cutting edge, and means to stop said edge before it completely shears said disc.

6. A dump bucket for wells including a tubular shell, a frangible disc closing the lower end thereof, a cutter in said shell including an inclined cutting face to progressively cut said disc, and means manually controlled to move said cutter to rupture said disc when said bucket is in the well, and means to insert a new disc laterally into said shell without uncoupling said shell.

7. A dump bucket for wells including a tubular shell, a frangible disc closing the lower end thereof, a cutter in said shell, means manually controlled to move said cutter to rupture said disc when said bucket is in the well, and means to insert a new disc laterally into said shell without uncoupling said shell, in which the cutter is slidable in said shell and adapted to be connected with a cable extending to the surface.

8. A dump bucket for wells including a tubular shell, a frangible disc closing the lower end thereof, a cutter in said shell, means manually controlled to move said cutter to rupture said disc when said bucket is in the well, and means to insert a new disc laterally into said shell without uncoupling said shell, in which a rod is secured to said cutter, a guide platform for said rod, said rod being slidable through said guide, and means on said rod to limit the movement of said rod in both directions.

9. A dump bucket for wells including a tubular shell having a guide therein and a bail thereon, the upper end of said bail being formed into a platform, an internal annular shoulder proximate the lower end of said shell, a transverse window slot in said shell proximately below said shoulder, said slot being adapted to admit therein metallic discs to close said shell, said discs being adapted to register approximately with the external periphery of said shoulder, a tubular peripheral extension of said shell below said shoulder, said extension having internal threads and openings for a wrench, a bottom nipple having external threads upon its upper end engageable with the threads of said tubular extension and adapted to force said discs upward from said slot and to engage same between it and said shoulder, a shaft slidable through said platform and guide and means for attaching a cable to the upper end of said shaft, a circular hollow member upon the lower end of said shaft, said member having a beveled cutting edge extending downward to a curved blade-like point and a longitudinal slot

through said member at the place most remote from said point, and an enlargement on said shaft, said enlargement being adapted to engage under said platform to support the weight of said shell and to normally poise said cutting edge proximately above said discs so that when said bottom nipple encounters sufficient resistance to support said shell said shaft will force said cutting edge to shear said discs to dump said bucket, the portion of said discs registering with said longitudinal slot remaining uncut so that the discs will be withdrawn with the bucket.

10. A dump bucket for wells including a tubular shell having a bail thereon, the upper end of said bail being formed into a platform, an internal annular shoulder proximate the lower end of said shell, a transverse window slot in said shell proximately below said shoulder, said slot being adapted to admit therein a metallic disc to close said shell, said disc being adapted to register with the external periphery of said shoulder, a tubular peripheral extension of said shell below said shoulder, said extension having internal threads, a bottom nipple having external threads upon its upper end engageable with the threads of said tubular extension and adapted to force said disc upward from said slot to engage said disc between it and said shoulder, a shaft slidable through said platform and means for attaching a cable to the upper end of said shaft, a circular hollow member upon the lower end of said shaft, said member having a bevelled cutting edge extending downward to a curved blade-like point, an enlargement on said shaft, said enlargement being adapted to engage under said platform to support the weight of said shell and to normally poise said cutting edge proximately above said disc so that when said bottom nipple encounters sufficient resistance to support said shell, said shaft will force said cutting edge to shear said disc.

11. A dump bucket for wells including a tubular shell having a bailer upon the upper end adapted to be engaged by a cable, a lateral transverse window slot in said shell proximate the lower end thereof, an annular shoulder in said shell proximately above said slot, a depending peripheral internally threaded tubular extension of said shell below said shoulder, a thin metallic disc adapted to be inserted through said slot to close said shell, said disc approximately registering with the outer periphery of said

shoulder, a bottom nipple having its upper end externally threaded to engage the threads of said depending extension and being adapted to force said disc upward from said window slot to engage the same between it and said shoulder, said nipple also having openings for a wrench and a lateral hand hole, a cutter shell slidable within said nipple, the upper end of said cutter being sloped to form a shearing surface to cut said disc, opposite longitudinal slots in said cutter shell, a pin through said nipple, said pin being slidable in said slots and adapted to poise said cutter proximately below said disc so that when said cutter encounters sufficient resistance it will shear said disc, except for a flap to retain the same in said bucket.

12. A dump bucket for wells including a tubular shell having a bailer upon the upper end adapted to be engaged by a cable, a lateral transverse window slot in said shell proximate the lower end thereof, an annular shoulder in said shell proximately above said slot, a depending peripheral internally threaded tubular extension of said shell below said shoulder, a thin metallic disc adapted to be inserted through said slot to close said shell, said disc approximately registering with the outer periphery of said shoulder, a bottom nipple having its upper end externally threaded to engage the threads of said depending extension and being adapted to force said disc upward from said window slot to engage the same between it and said shoulder, a cutter shell slidable within said nipple, the upper end of said cutter being sloped to form a shearing surface to cut said disc, and a longitudinal slot in said cutter shell, a pin in said nipple, said pin being slidable in said slot, and adapted to poise said cutter proximately below said disc so that when said cutter encounters sufficient resistance it will shear said disc.

13. In a dump bailer for wells the combination of a shell and cutter assembly adapted to be lowered into a well and withdrawn therefrom, the shell of said assembly having proximate the lower end thereof a transverse side window slot through which metallic discs may be removably placed to hold the contents of said shell, and means for shearing said discs to dump said contents, said means consisting of a tubular knife having beveled cutting edge actuated by gravity from a portion of said assembly.

ALEXANDER BOYNTON.