

Jan. 12, 1926.

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DEVICE FOR INTRODUCING CEMENT IN WELLS

Filed Jan. 23, 1923

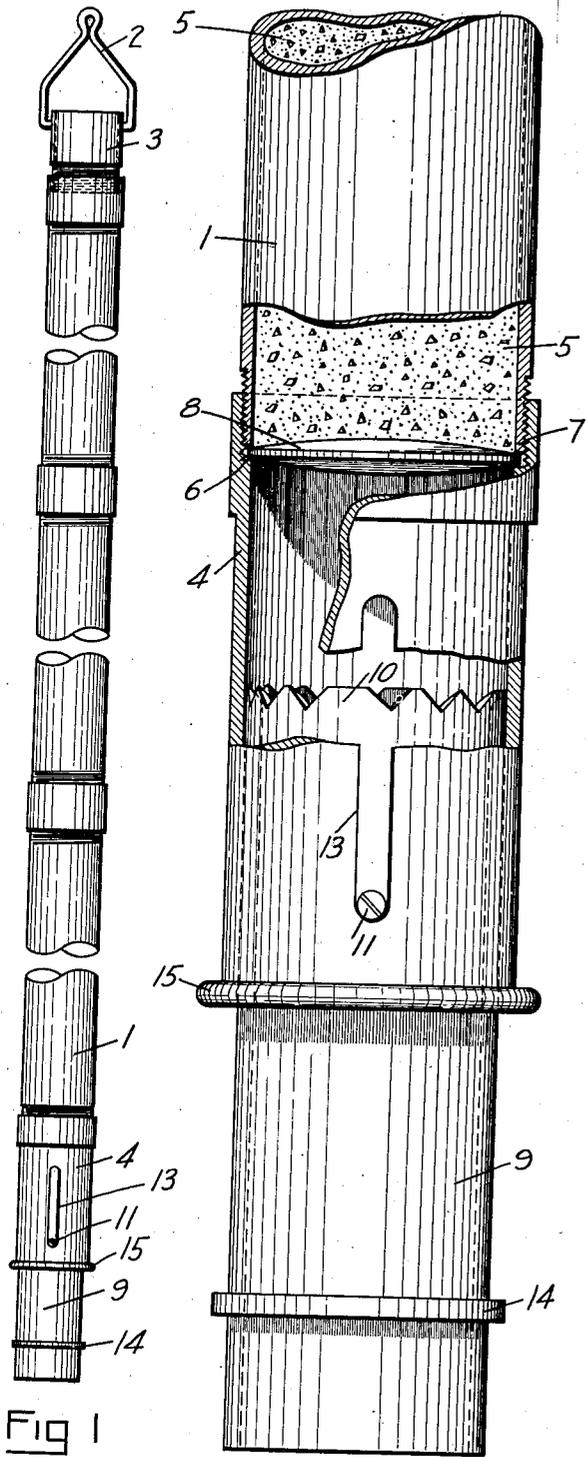


Fig 1

Fig 2

WITNESS  
R. B. Ogden

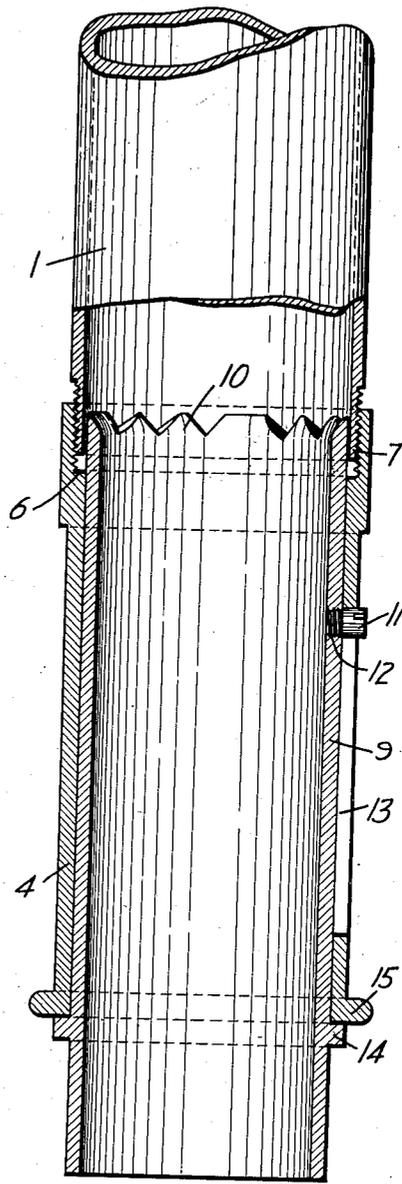


Fig 3

INVENTOR.  
CARLTON E. MILLER  
BY *White, Probst & Swans*  
his ATTORNEYS.

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# UNITED STATES PATENT OFFICE.

CARLTON E. MILLER, OF SAN FRANCISCO, CALIFORNIA.

DEVICE FOR INTRODUCING CEMENT IN WELLS.

Application filed January 23, 1923. Serial No. 614,495.

*To all whom it may concern:*

Be it known that I, CARLTON E. MILLER, a citizen of the United States, and a resident of the city and county of San Francisco and State of California, have invented a new and useful Device for Introducing Cement in Wells, of which the following is a specification.

The invention relates to means for introducing cement into deep wells such as oil wells for the purpose of sealing off water encountered during the drilling of the well.

As is well known, in drilling deep wells for oil, for instance, strata of material are penetrated, some of which contain water, and in order that the well may be carried below such a strata the string of casing must be securely landed below it, sealing the bore of the well and preventing the flow of water into the finished well.

In the process of sealing off water in an oil well, it is customary to introduce cement into the well by means of an elongated container, usually called a bailer, having a foot valve which is opened when the bailer strikes the bottom of the well, supposedly discharging the cement at this point. These foot valves when opened usually constrict the discharge area of the bailer so that frequently when the valve is opened the cement is not discharged from the bailer at the water zone but is discharged as the bailer is again pulled up thru the water in the well. There is no assurance, therefore, that the cement introduced into the well has been placed at the desired zone.

An object of my invention is to provide a bailer or a device for introducing cement into the well which will discharge the cement at the bottom of the well.

Another object of the invention is to provide a device of this character having an unrestricted discharge outlet for the cement.

A further object of the invention is to provide a device of this character having a removable bottom which is placed above the bottom of the bailer, so that when the bottom is removed, the cement contents of the bailer has an initial free falling movement, the momentum of the moving cement being sufficient to cause its complete discharge from the bailer.

A further object of the invention is to provide a bailer which may be formed of one or more lengths of well casing, thus reducing the expense of the bailer.

The invention possesses other features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of my invention which is illustrated in the drawings accompanying and forming part of the specification. It is to be understood that I do not limit myself to the showing made by the said drawings and description, as I may adopt variations of the preferred form within the scope of my invention as set forth in the claims.

Referring to the drawings, Fig. 1 is an elevation of the container as it appears when charged with cementitious material. Fig. 2 is an elevation and partial section of the lower part of the container showing the interior structure and the position of the parts before the cementitious material is discharged. Fig. 3 is a sectional view through the axis of the container showing the interior structure and the position of the parts after the cementitious material has been discharged.

Broadly stated, the preferred embodiment of my invention comprises a tubular body, a frangible bottom on the body supporting a charge of cementitious material contained therein and means for fracturing the bottom to release the material from the body.

The container comprises an elongated tubular body, the major portion of which is preferably made up of one or more connected lengths of well casing 1, Fig. 1, so that the cost of the bailer to the user may be thus decreased. A bail 2 for attaching the container to a casing line, in combination with a threaded collar 3 for engagement with the upper end of the casing and a hollow foot 4 to be attached to the lower end of the casing, completes the container. The charge of cementitious material 5 is limited only by the length of a string of casing commensurate with the height of the derrick. Seated near the top of the foot 4 on the shoulder 6 and held in place by the threaded end 7 of the casing 1, is a frangible bottom consisting of a crockery or glass plate 8, Fig. 2, preferably lenticular in cross section to provide the necessary strength for supporting the load of cement in the container. A hollow plunger 9 providing an unrestricted discharge outlet for the cement, slidably mounted within the foot 4 has a toothed edge 10 for disrupting the crockery plate 8 into a plurality of fragments and a smooth

inner bore, facilitating the complete discharge of the cement. The crockery plate 8 is seated above the bottom of the container so that on disruption by the toothed plunger 9, the charge of cement 5 has an initial free fall in the container to further facilitate its discharge. The hollow plunger 9 is provided with a screw 11 firmly fixed in the threaded aperture 12, Fig. 3, the head of the screw engaging a slot 13 in the foot 4 which limits its downward movement, as shown in Fig. 2. The shoulder 14 on the plunger engages the lower end of the foot 4 limiting its upward movement, as shown in Fig. 3. The hollow foot 4 is provided with a semi-circular shoulder or guard 15, having a circumference substantially greater than that of the container to keep it centered in the well, thereby preventing the plunger from striking during the process of lowering the container and prematurely discharging its contents. The frangible plate 8 is placed in its seat 6 and the casing 1 screwed down until the plate is engaged. The container is then filled with cementitious material and lowered into the well, the plunger 9 falling to its extreme lower position by its own weight, as shown in Fig. 2. The container is lowered to the bottom of the well, the plunger 9 striking the bottom, contacting with and shattering the crockery plate 8 into a plurality of fragments, and permitting the free discharge of the cement into the bottom of the well.

I claim:

1. A device for depositing cementitious material, comprising a tubular body, a hollow foot attached thereto, a plate clamped between the body and the foot and closing the lower end of the body, and means within said foot to engage and release said plate.

2. A device for depositing cementitious material, comprising a tubular body, a hollow foot attached thereto, a plate seated in the foot and closing the lower end of the body, and a hollow plunger within said foot adapted to release said plate, whereby the material discharges through said plunger.

3. A device for depositing cementitious material, comprising a tubular body, a hollow foot attached thereto, a frangible plate clamped between the body and the foot and

closing the lower end of the body and means within said foot adapted to engage and fracture said plate.

4. A device for depositing cementitious material comprising a tubular body, a hollow foot attached thereto, a plate seated in the foot, a hollow plunger telescoped with said foot, having a toothed edge adapted to engage and release said plate.

5. A device for depositing cementitious material comprising a bail, casing attached thereto, a slotted hollow foot attached to the casing, a frangible plate seated therein, a hollow plunger having a pin rigidly fixed thereto for engagement with said slot and limiting the downward movement of the plunger, and having a shoulder for engagement with the lower end of the foot and limiting the upward movement of the plunger, and means for centering said plunger in the well.

6. A container for depositing cementitious material in a deep well, comprising a bail, casing attached thereto, a foot attached to the casing, a frangible plate, a plunger within the foot for engagement with the plate and a shoulder on said foot for centering the container in the well.

7. A device for depositing cementitious material comprising a tubular body having a discharge outlet in the bottom of substantially the same diameter as the body, a removable plate closing said outlet and a tubular plunger slidable in said body below the plate adapted to be moved relatively to the body, to release the plate from the body and permit the discharge of the material through the plunger.

8. A device for depositing cementitious material comprising a tubular body having a wide open bottom to permit the unrestricted discharge of the material, a plate closing the bottom of the body, a tubular foot attached to the body and extending below said plate and a tubular plunger of substantially the same diameter as the body, slidable in said foot and adapted to contact with and release the plate to permit the discharge of the material through the plunger.

In testimony whereof, I have hereunto set my hand.

CARLTON E. MILLER.