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WELL CLEAN-OUT BAILER

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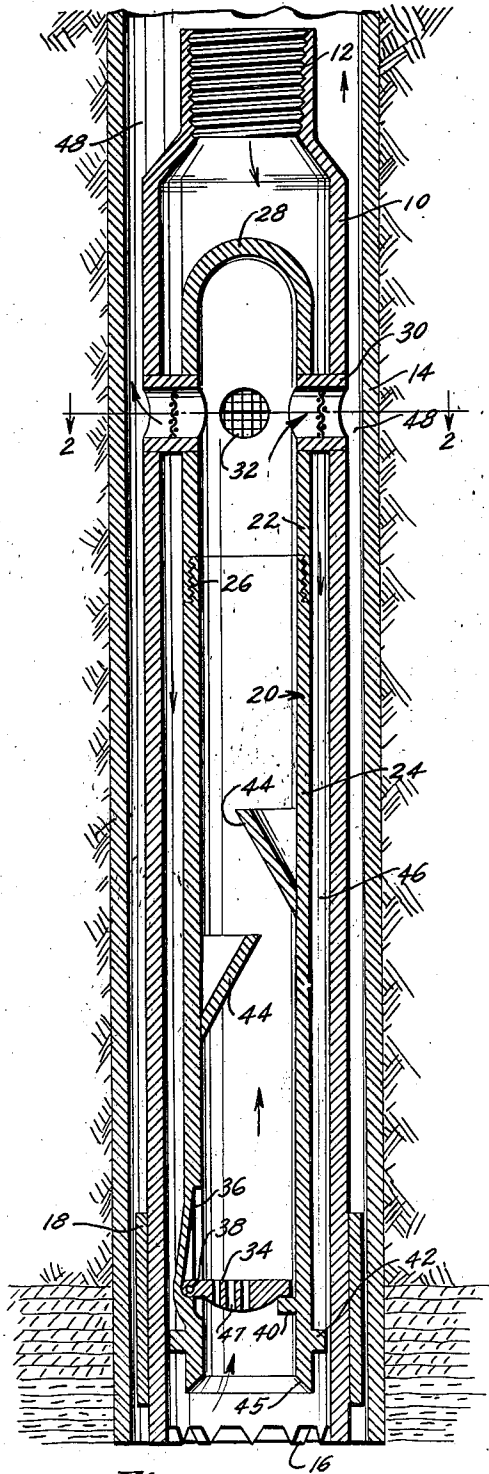


Fig. 1

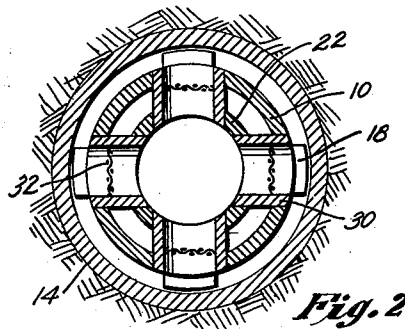


Fig. 2

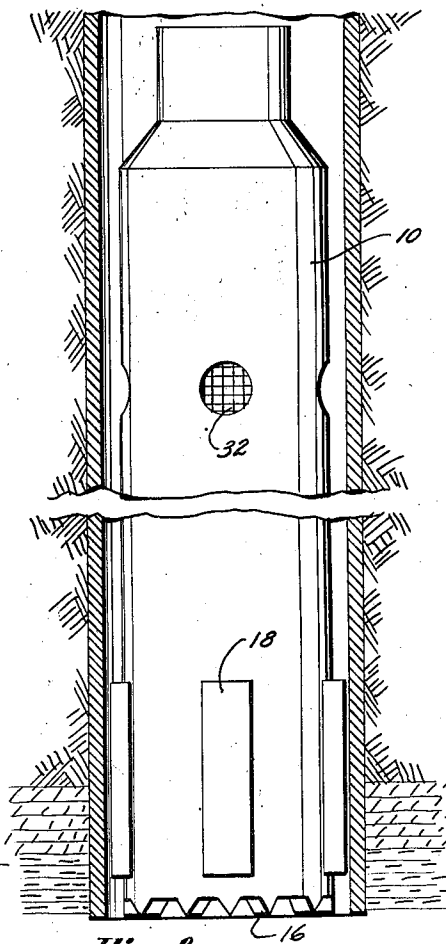


Fig. 3

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WELL CLEAN-OUT BAILER

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6 Claims. (Cl. 166—19)

This invention relates to a tool or bailer adapted for use in oil, water or gas wells for cleaning out debris such as rock bits, cones, bit heads, reamers, or the like.

An important object of this invention is to provide a bailer for cleaning out oil and gas wells involving the use of fluid circulated through the bailer to cause a lifting of any debris in the well hole into the bailer.

Another important object of this invention is to provide a bailer for cleaning out oil and gas wells by fluid forcing any debris into the well hole into the bailer, and causing the debris to be trapped in the bailer upon a stoppage of fluid circulation.

Other objects and advantages of my invention will be evident from the following detailed description read in conjunction with the accompanying drawing which illustrates one form of my new invention.

In the drawing:

Fig. 1 is a vertical sectional view of the invention shown disposed in a well hole.

Fig. 2 is a view taken on line 2—2 of Fig. 1.

Fig. 3 is a fragmentary elevational view of the invention shown in a well hole.

Referring to the drawing in detail and more particularly to Fig. 1, the improved tool or bailer comprises an outer cylinder 10 having an upper threaded portion 12 of reduced diameter adapted to be connected to a string of tubing (not shown) in a well hole. The cylinder 10 is disposed in spaced relation to the casing 14 in the well hole. The lower end of the cylinder 10 is provided with a plurality of circumferentially disposed serrations or teeth 16 adapted to work into and encompass any debris such as broken pieces of cones, bit heads, reamers or the like (not shown) that may be present in the bottom of the well hole. The teeth 16 dig into the structure to effect a seal between the cylinder 10 and the bottom of the well hole as well as assure rigidity of the bailer. The outer periphery of the cylinder 10 is provided with a plurality of equally spaced lugs 18 (preferably three in number), to provide proper clearance between the cylinder 10 and the casing 14.

A cylindrical container 20 is disposed within the outer cylinder 10 in spaced relation thereto, and comprises an upper cylindrical member and a lower cylindrical member 24 in threaded engagement with each other at 26. The upper end of the member 22 is closed off by a loop portion 28. The member 22 is provided with a plurality of apertured projections or conduits 30 (preferably four in number, Fig. 2) adapted to be fixed in complementary apertures provided in the outer cylinder 10, thus securing member 22 in the cylinder 10. A plurality of screens or bars 32 are disposed within the apertured projections 30 for a purpose as will be hereinafter set forth.

The lower cylinder 24 is removable from the upper cylinder and is provided with a disc shaped flapper valve 34 disposed within the interior thereof. It is to be noted that the inner periphery of the cylinder 24 is provided with a recess 36 to allow substantially full opening of the flapper valve 34. The valve 34 is hinged or pivoted to the cylinder 24 by the pin 38. A projection is disposed substantially diametrically opposite the pin 38, allowing the valve 34 to seat thereon and close, thereby preventing swinging movement in a downward direction. A plurality of lugs 42 are provided on the outer periphery of cylinder 24 in order to provide the proper clearance or spacing with respect to cylinder 10. Although not essential, the interior of the cylinder 24 is shown provided with a plurality of baskets 44 disposed in staggered relation which assist in trapping debris as will be hereinafter set forth.

Operation

In operation the bailer, in complete assembly is lowered into the well by a string of tubing (not shown) and is allowed to rest on the bottom of the hole, with the teeth 16 encompassing any debris that is present in the well hole. Fluid under pressure, such as gas or liquid, is introduced into the tubing from any suitable source at the top of the well (not shown) and flows from the tubing into the space 46 between the inner container 20 and the outer cylinder 10. It is to be noted that the container 20 is arranged in the cylinder 10 so that the lowermost portion 45 of cylinder 24 is disposed a slight distance upwardly from the lowermost point of the outer cylinder 10. The fluid flows from space 46 and stirs up any debris encompassed by the cylinder 10 and carries it into the container 20. It will be understood that the pressure of the fluid causes opening of the flapper valve 34. The valve 34 is provided with a plurality of perforations or apertures 47, preferably disposed adjacent the hinge pin 38, so that the fluid can flow through the apertures and remove any debris which may fall on the valve 34 and prevent its opening. As long as the fluid pressure is present, the debris is held in the interior of the container 20, with the fluid flowing through the apertured projections 30 into a space 48 between the outer cylinder 10 and the casing 14, and on to the top of the well. It will be apparent that any debris pres-

ent in the container 20 is prevented from passing out into the space 48 by the screens 32.

In order to entrap the debris within the bailer, the fluid at the top of the well is shut off thereby releasing the pressure against the flapper valve 34 causing it to close, with the debris in the bailer. It will be obvious that the baskets 44 assist the valve in trapping the debris. The bailer and its entrapped debris can then be removed from the well, and the lower cylinder 24 unscrewed from the cylinder 22 to dump the debris collected in the container 20. If necessary the bailer can be again lowered into the well and the operation repeated.

Changes may be made in the combination and arrangement of parts as heretofore set forth in the specification and shown in the drawing, it being understood that any modification in the precise embodiment of the invention may be made within the scope of the following claims without departing from the spirit of the invention.

What I claim is:

1. A bailer disposed in spaced relation to the casing in a well hole comprising a cylinder adapted to receive a fluid under pressure, a container arranged within the cylinder in spaced relation thereto and having its lowermost portion positioned away from the lowermost portion of the cylinder to allow fluid from the cylinder to stir up any debris encompassed by the cylinder and deposit it in the container, means providing an outlet for the fluid from the container into the casing, means in said outlet means preventing passage of any debris deposited in the container, and means provided in the container for trapping the debris in the container upon release of the fluid pressure.

2. A bailer disposed in spaced relation to the casing in a well hole comprising a cylinder adapted to receive a fluid under pressure, a container arranged within the cylinder and in spaced relation thereto, said container having its lowermost portion positioned away from the lowermost portion of the cylinder to allow fluid from the cylinder to stir up any debris encompassed by the cylinder and deposit it in the container, a plurality of conduits providing an outlet for the fluid from the container into the casing, a screen in each of said conduits for preventing passage of any debris deposited in the container, and a

flapper valve provided in the container for trapping the debris in the container upon release of the fluid pressure.

3. A bailer disposed in spaced relation to the casing in a well hole comprising a cylinder adapted to receive a fluid under pressure, said cylinder having a plurality of teeth arranged at its lower end for encompassing any debris in the well hole, a container arranged in the cylinder in spaced relation thereto, means provided in the container allowing passage of fluid and debris into the container, means providing an outlet for the fluid from the container into the casing, means in said outlet means preventing passage of debris through the outlet means.

4. A bailer disposed in spaced relation to the casing in a well hole comprising a cylinder adapted to receive a fluid under pressure, said cylinder having a plurality of teeth arranged at its lower end for encompassing any debris in the well hole, a container arranged in the cylinder in spaced relation thereto, a valve provided in the container allowing passage of fluid and debris into the container, a plurality of conduits providing an outlet for the fluid from the container into the casing and a screen in said conduits preventing passage of debris through the conduits.

5. A bailer disposed in spaced relation to the casing in a well hole comprising a cylinder adapted to receive a fluid under pressure, a container arranged within the cylinder in spaced relation thereto for receiving any debris stirred up by the fluid flowing from the cylinder into the container, means providing an outlet for the fluid from the container into the casing, means preventing passage of the debris through the outlet means, and means for trapping the debris in the container upon a release of fluid pressure.

6. A bailer disposed in spaced relation to the casing in a well hole comprising a cylinder adapted to receive a fluid under pressure, a container arranged within the cylinder in spaced relation thereto for receiving any debris stirred up by the fluid flowing from the cylinder into the container, a conduit providing an outlet for the fluid from the container into the casing, a screen preventing passage of the debris through the conduit, and a valve for trapping the debris in the container upon the release of fluid pressure.

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