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LE ROY F. KIME ET AL

1,845,799

BAILER

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Fig. 1.

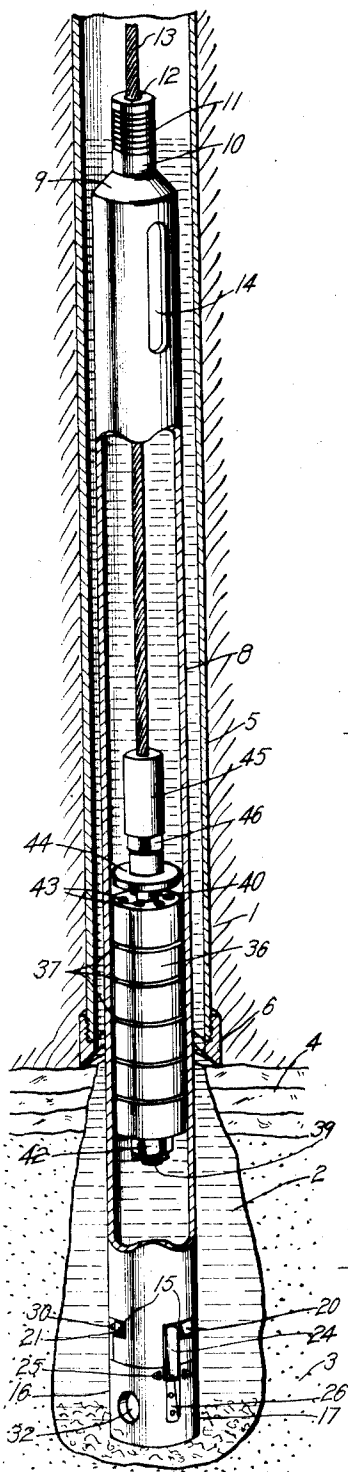


Fig. 2.

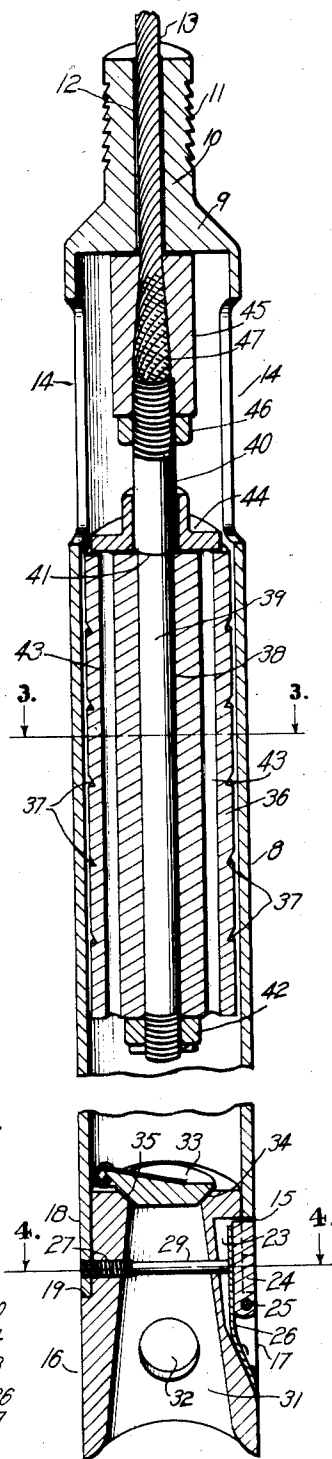


Fig. 3.

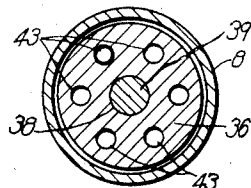


Fig. 4.

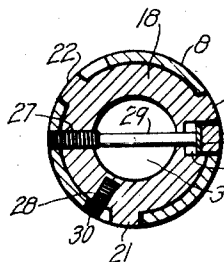
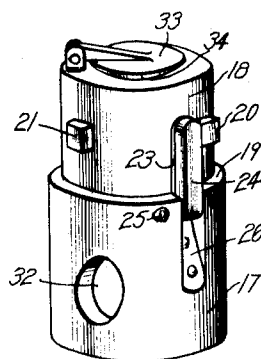


Fig. 5.



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BAILER

Application filed August 13, 1928. Serial No. 299,304.

Our invention relates to bailers and more particularly to a device of that character employed in oil well drilling and pumping practice for taking samples of fluid and removing cavings and the like from the bottom of a well; the principal object of the invention being to increase the intake efficiency of a bailer of the reciprocable plunger type by including in the piston a plurality of valved relief ports whereby fluid is admitted to the portion of the barrel above the piston on the down-stroke, for effecting a fluid seal between the piston and barrel during the upward or intake stroke.

In accomplishing these and other objects of the invention we have provided improved details of structure the preferred forms of which are illustrated in the accompanying drawings, wherein:

Fig. 1 is a central vertical section through the lower portion of an oil well showing our improved bailer applied therein, parts of the bailer being broken away for better illustration.

Fig. 2 is an enlarged longitudinal section through the bailer showing the piston at the upper limit of its travel with the valves closed.

Fig. 3 is a section on the line 3—3, Fig. 2.

Fig. 4 is a section on the line 4—4, Fig. 2.

Fig. 5 is a detail perspective view of the base shoe.

Referring in detail to the drawings:

1 designates the lower portion of an oil well including the usual shot hole 2 formed in the oil sand 3 below the cap rock 4, the portion of the well above the shot hole being lined with casing 5 supported on the cap rock by a shoe 6.

The bailer includes a barrel 8 sufficiently smaller in diameter than the interior of the casing to permit its free passage through a column of fluid in the casing, and sufficient in length to receive a quantity of fluid and to accommodate a plunger and cable connector as hereafter described.

The barrel 8 has a closed upper end 9 provided with an upwardly protruding neck 10 having the usual peripheral corrugations 11 for engagement by fishing tools, and a central

opening 12 for a supporting line 13. The wall of the barrel is provided adjacent its upper end with elongated ports 14 for outlet of fluid and at its lower end with bayonet slots 15 for the attachment of a base shoe 16.

The base shoe 16, which is removably attached to the barrel, comprises a shouldered cylindrical body including a lower portion 17 equal in diameter to the barrel, a reduced upper portion 18 fitting within the barrel, and the intermediate shoulder 19 formed between the upper and lower portions and engaging the bottom edge of the barrel when the parts are assembled.

Formed integrally with and protruding outwardly from the wall of the upper body portion 18 are equally spaced bosses 20, 21 and 22 engageable with the bayonet slots 15 for supporting the base shoe in assembled relation with the barrel.

Formed in the wall of the body portion 18 at one side of the boss 20 is a slot 23 extending downwardly into the lower portion 17 of the shoe, and located in the upper portion of the slot is a latch 24 pivotally mounted on a pin 25 extending through the lower end of the latch and through the slot at a point slightly below the shoulder 19.

A flat spring 26 fixed in the lower end of the slot 23 engages the inner side of the latch 24 for yieldingly urging the latch into engagement with the vertical portion of a bayonet slot 15 when the shoe is assembled on the barrel, thereby preventing rotation of the shoe relative to the barrel, and retaining the bosses in the horizontal portions of the bayonet slots for supporting the base shoe on the barrel.

In order to further insure the retention of the base shoe in its assembled relation with the barrel, we provide threaded openings 27 and 28 in the wall of the upper portion 18, the openings 27 being located opposite the slot 23 and fitted with an adjustable locking pin 29 extending through an opening in the wall of the barrel and engaging the inner surface of the flat spring to prevent depression of the latch when the members are assembled, the opening 28 being located at one side of the boss 21 and fitted with a screw

30 protruding into a bayonet slot and engaging the side edge of said slot opposite the edge engaged by said boss and serving to cooperate with the latch in preventing rotation of the base shoe relative to the barrel.

A tapered opening 31 extends longitudinally through the base shoe, and ports 32 in the wall of the lower portion 17 communicate with the opening and serve as inlets for the fluid. Hingedly mounted on the top of the shoe is a flap valve 33 adapted for normally closing the opening 31 and preferably having a tapered portion 34 for seating in a tapered seat 35 at the top of the opening.

Reciprocally mounted in the barrel is a plunger including a cylindrical body 36 provided on its outer surface with vertically spaced annular grooves 37, and having a central longitudinal opening 38 engaged by a rod 39. The rod 39 is provided with an upper enlarged portion 40 threaded at its upper end and having a shoulder 41 engaging the top end of the plunger, the lower end of the rod being threaded and engaged by a nut 42 whereby the rod is secured in the plunger.

Equally spaced channels 43 extend vertically through the plunger, and a plate valve 44 slidably mounted on the enlarged portion 40 of the rod 39 is adapted for opening and closing the upper ends of the channels when the plunger is in operation.

Threadedly engaged on the upper end of the rod portion 40 is a socket 45 locked to the rod by a nut 46 and having a tapered central opening 47 in which the bottom end of the cable 13 is secured by means of solder or like metal which may be poured into the opening between the spread strands of the cable. The upper end of the socket is engageable with the closed end of the barrel for supporting the assembled bailer.

When the bailer, assembled as described, is being lowered into a well, the socket 45 engages the upper closed end of the barrel 8 as shown in Fig. 2. The valves 33 and 44 remain closed until the column of fluid in the casing is encountered, whereupon the valves open to admit the fluid into the barrel 8 and permit passage of the fluid through the outlet ports 14. When the base shoe 16 arrives in engagement with the bottom of the shot hole and arrests downward travel of the barrel 8, the valve 33 closes and continued downward movement of the cable 13 causes the piston suspended from the cable to continue downwardly in the barrel as shown in Fig. 1, the valve 44 on the piston remaining open to permit fluid trapped below the piston to pass into the portion of the barrel above the piston.

As the piston is lifted upwardly in the barrel, the valve 44 closes so that part of the fluid above the piston is forced out through the outlet ports 14 and a portion of the fluid passes between the slightly spaced walls of

the piston and barrel to be intercepted by the annular grooves 37, thereby effecting a fluid seal between the members, the suction created by the piston causing a fluid charge to be drawn into the barrel below the piston. Continued upward movement of the cable line 13 brings the socket 45 into engagement with the top of the barrel so that the bailer with its contained fluid charge may be lifted from the well.

What we claim and desire to secure by Letters Patent is:

1. A pipe joint including an outer pipe having a bayonet slot, an inner pipe removably attached to the end of the outer pipe and having an outwardly opening recess and a lug movable into said bayonet slot to form a bayonet joint, a latch pivotally mounted in said recess, a spring yieldingly urging the latch into said slot for latching engagement with the outer pipe, and a transverse locking pin threadedly engaged in the inner pipe and engageable with said spring for securing the latch in its engagement with the outer pipe.

2. In a device of the character described including telescoping pipes having a bayonet joint therebetween and a spring supported latch yieldingly urged into latched engagement with one of said pipes to latch the pipes in joined relation, a transverse locking pin cooperating with the latch to retain the pipes in latched relation.

3. In a device of the character described, outer and inner telescoping pipes having respectively a bayonet slot and a lug cooperating with said slot to form a bayonet joint, the inner pipe having an outwardly opening recess, a latch pivotally mounted in said recess, a spring yieldingly urging the latch into latched engagement with the outer pipe, and a locking pin having adjustable mounting on the inner pipe and having a portion engageable with said spring for securing the latch in its engagement with the outer pipe.

4. A pipe joint including an outer pipe having a bayonet slot and an inner pipe telescopingly receivable in the outer pipe and having a lug receivable in said slot to form a bayonet joint, said inner pipe having an outwardly opening recess, a latch having pivotal mounting on said inner pipe and movable through the longitudinal portion of said bayonet slot into and out of said recess, a spring located in said recess and bearing against one end of said latch to urge the same to move pivotally into the recess, and means movably mounted in said inner pipe for limiting movement of the latch into the recess.

5. In a device of the character described including telescoping tubular members having respectively a slot and a lug movable in said slot to form a bayonet joint, a latch hinged to one of said members having a portion movable into said slot to stop said lug for locking the members in joined relation, a spring bear-

ing against said latch to urge the same into the slot, and movable means for limiting movement of said latch into the slot.

6. In a device of the character described,
5 a pipe end portion having a bayonet slot including longitudinal and lateral portions, a pipe end portion telescoped in said first named pipe end portion having a recess registering with the slot of the first named pipe
10 end portion, a lug on said second named pipe end portion receivable in said bayonet slot, a latch having hinged mounting on said second named pipe end portion and including a portion movable through said longitudinal
15 portion of the bayonet slot into the recess of the second named pipe end portion, a spring operating in said recess and bearing outwardly against the latch, means anchoring the spring to said second named pipe
20 end portion, and means including a pin extending transversely through the second named pipe end portion and having an end extending into said recess and a portion to engage said spring for limiting movement
25 of the latch into said recess.

7. In a device of the character described including an apertured upper pipe having a bayonet slot in its lower end including longitudinal and lateral portions, a lower pipe having a reduced upper end receivable in the
30 upper pipe and a shoulder to engage the lower end edge thereof, and provided with a longitudinal recess including an upper end registering with the longitudinal slot portion
35 of the upper pipe and lower end, a lug on said reduced end of the lower pipe at one side of the upper portion of said slot therein, and receivable in said bayonet slot to form a bayonet joint, a latch including a lower end located in the lower end of said recess and an
40 upper end movable through said longitudinal bayonet slot portion into the upper end of said recess, a pin extending through the lower end portion of said latch and having
45 opposite ends mounted in the side walls of the lower end of said recess for pivotally supporting the latch for pivotal movement through the slot of the upper pipe into the upper end of said recess, a spring in said
50 recess and bearing against the lower end of the latch to urge the upper end thereof through the upper pipe slot into the upper end of said recess, means anchoring the lower end of the spring to the bottom of the lower end of said
55 recess, a pin extending transversely through the aperture of the upper pipe including a portion threadedly engaged with the lower pipe and an end portion extending sufficiently into the upper end of the recess to engage
60 said spring for limiting pivotal movement of said latch into the upper end of said recess.

In testimony whereof we affix our signatures.

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FRED F. UHL.