July 21, 1931. N. H. RICKER 1,815,364

CATCHER FOR SWAB PLUNGERS

Filed Oct. 14, 1929

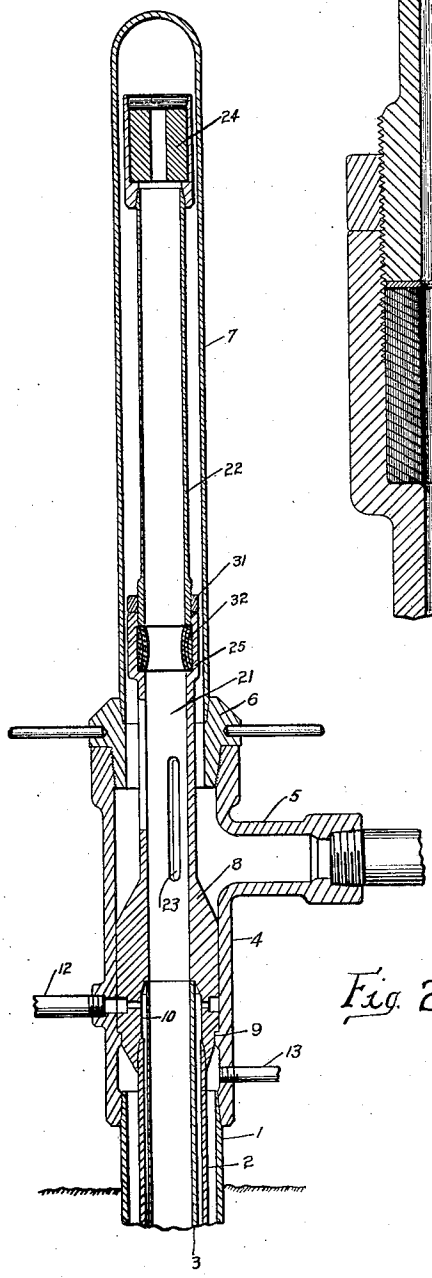


Fig. 2

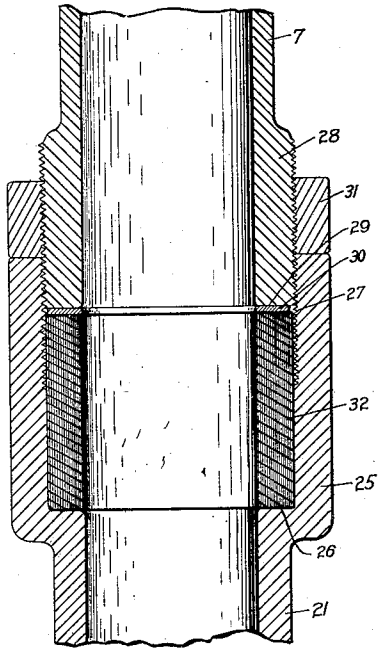


Fig. 1

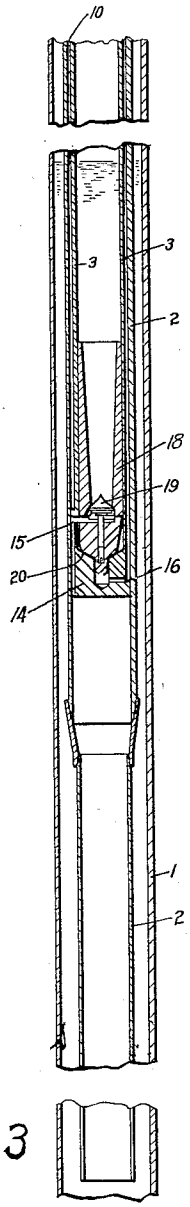


Fig. 3

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UNITED STATES PATENT OFFICE

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CATCHER FOR SWAB PLUNGERS

Application filed October 14, 1929. Serial No. 399,654.

My invention relates to means to engage and hold the plunger employed in pneumatically operated swabs for deep walls.

It is an object of the invention to provide means to engage and hold the swab plunger at the upper end of its stroke whenever desired.

In the operation of swabs in deep wells where the swab is blown to the surface by the force of gas under pressure, the plunger passes the outlet opening and then drops back to the bottom for the next stroke. At times, however, it is desirable to remove the swab for inspection, replacement or repair, and my invention has for its purpose to provide a means to engage and hold the plunger when it reaches the upper end of the eduction tube so that it may be then removed.

I desire to provide a compressible sleeve which is normally out of the way in inactive position, but which may be compressed longitudinally when desired so as partially to block the passage of the plunger and hold said plunger from further movement.

The drawings herewith, illustrate a well apparatus in which my invention is employed. Fig. 1 is a central vertical section through my improved catcher. Fig. 2 is a vertical section through the upper end of a swabbing apparatus with which my invention is employed. Fig. 3 is a similar view of the lower end of said apparatus.

The apparatus shown in Figs. 2 and 3 is employed in lifting liquids from wells by a fluid pressure operated swab, and is disclosed in my prior co-pending application, Serial No. 388,189, filed August 24, 1929. It includes an outer casing 1, an inner pipe 2 and a central eduction tube 3.

The casing 1 is connected at its upper end to a special casing head 4 having an outlet 5 for the liquid being pumped. The upper end of the casing is connected by a bushing 6 to a plug or cap which is elongated to house the upper end of the eduction apparatus. The pipe 2 and the eduction tube 3 are connected at their upper ends to a head 8 fitting the casing head and supported upon a shoulder 9 therein. The pipe 2 and tube 3 are spaced slightly apart to provide a fluid passage 10 between them, and an inlet pipe 12 is connected therewith. A pipe 13 connects with the space between the casing and the pipe.

The lower end of the eduction tube is closed by a head 14 which also fits within the pipe 2. A passage 15 is left for the well liquid to enter above the head, and a passage 16 allows pressure fluid from the surface to enter below the liquid. A swab plunger 18 having an upwardly closing valve 19 therein is seated upon a seat 20 at the upper side of the head 14 above the air inlet 16.

The head 8 at the upper end of the eduction tube 3 is tubular and has a passage 21 which projects upwardly through the bushing 6, and is connected with a nipple 22 housed in the plug 7. Laterally opening slots 23 in the head allow the outlet of liquid to the discharge pipe 5. A shock absorbing buffer 24 is secured at the upper end of the nipple 22 to be engaged by the swab when it is blown up past the outlet with force, as sometimes accidently occurs.

My swab catcher is shown at the upper end of the head 8 above the outlets 23. The passage 21 is enlarged at 25 to provide an internal shoulder 26. The upper end is internally threaded at 27 to receive the lower end 28 of the nipple 22 which when screwed therein presents a lower shoulder 29 which is spaced from the shoulder 26 to receive between them a sleeve 32 of rubber or similar compressible composition. It will be seen that I can screw the nipple downwardly upon the sleeve 32 and compress it longitudinally so as to bulge it inwardly between its ends as shown in Fig. 2. Under working conditions, the sleeve 32 is not compressed, and is in the position shown in Fig. 1. I employ a washer 30 on the upper end of the sleeve so that the nipple may be screwed down without wearing or twisting the rubber. A locking ring or nut 31 is shown to prevent accidental tightening of the joint.

In the operation of the swab, the introduction of air below the swab under sufficient pressure will lift the swab and its load of liquid to the surface. The liquid will discharge through the outlets 23 and 5, and the swab will pass upwardly above these open-

ings into the nipple 7, thus allowing the air to exhaust through the outlet openings. The valve in the swab will open, and the swab will drop to the bottom again for another stroke. When I desire to engage the swab and hold it from dropping, I remove the cap 7 and screw the nipple 22 downwardly to compress the sleeve 32 so as to distend it laterally to constrict the passage as seen in Fig. 2. When the swab is then raised to the surface in the usual manner, it will be blown up past the outlets 23 and will try to pass into the nipple 22. In so doing, it will be engaged by the sleeve 32, and will be held frictionally against dropping back again. The nipple may then be removed, and the swab plunger will be accessible for removal and inspection.

It will be seen that my catcher is a simple one, and will be easily operated without material loss of time. It will not damage the swab plunger, and when not in use will be out of the way. While I have shown one embodiment of the invention, however, I wish it to understood that various changes may be made coming within the scope of the appended claims.

What I claim as new is:

1. In a device of the character described including an eduction tube for wells, a plunger therein, means to introduce gaseous pressure fluid below said plunger to lift it upwardly, in combination with a yieldable device at the upper end of said tube to engage and hold said plunger when desired.

2. In a device of the character described including an eduction tube for wells, a plunger therein, means to introduce gaseous pressure fluid below said plunger to lift it upwardly, in combination with a plunger engaging device at the upper end of said tube, normally allowing said plunger to pass, but operative when desired automatically to engage and hold said plunger.

3. In a device of the character described including an eduction tube for wells, a swab plunger therein, pneumatic means to force said plunger upwardly therein to raise liquid in said tube, a compressible sleeve adjacent the upper end of said tube, normally permitting said plunger to pass, but adjustable partially to obstruct said passage and hold said plunger therein.

4. In a device of the character described including an eduction tube for wells, a swab plunger therein, pneumatic means to force said plunger upwardly therein to raise liquid in said tube, a compressible sleeve adjacent the upper end of said tube, normally permitting said plunger to pass, but compressible longitudinally partially to obstruct the upper end of said tube and frictionally engage and hold said plunger.

5. In a pneumatically operated swab apparatus including an eduction tube, having lateral fluid outlets adjacent the upper end and a nipple above said outlets, a swab plunger in said tube, and means adjacent the lower end of said nipple adapted to be operated to constrict the passage therethrough and frictionally engage said swab plunger.

6. In a pneumatically operated swab apparatus, an eduction tube, a swab plunger operating therein in combination with a frictional swab-engaging device adjacent the upper end of said tube operable to engage and hold said plunger.

7. In a pneumatically operated swab apparatus, an eduction tube, a swab plunger operating therein in combination with means adjacent the upper end of said tube, normally clearing the passage for said plunger but manually operable partially to obstruct said passage and hold said plunger.

In testimony whereof, I hereunto affix my signature, this the 20th day of September, A. D., 1929.

NORMAN H. RICKER.