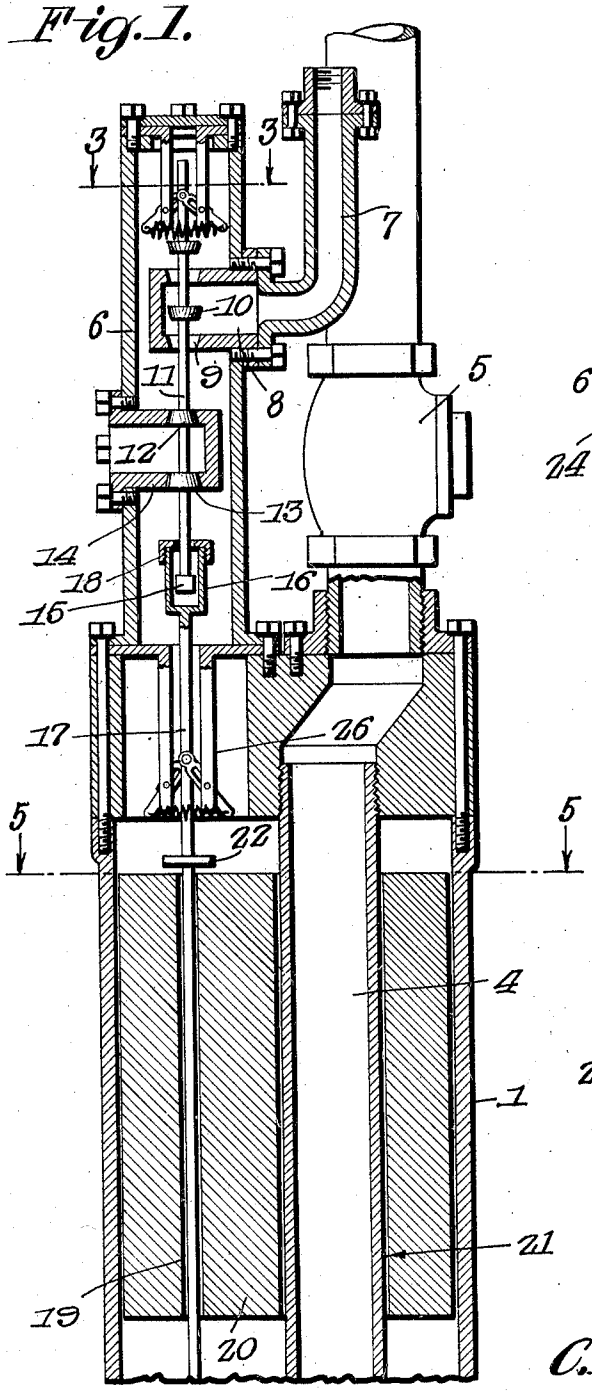
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PUMP FOR OIL WELLS

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Fig. 1.



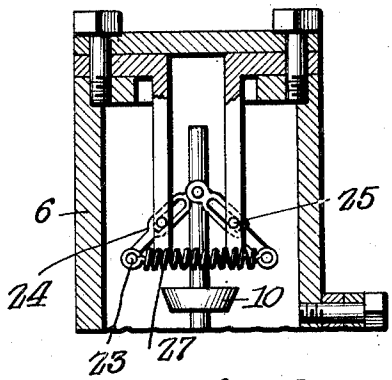


Fig. 2.

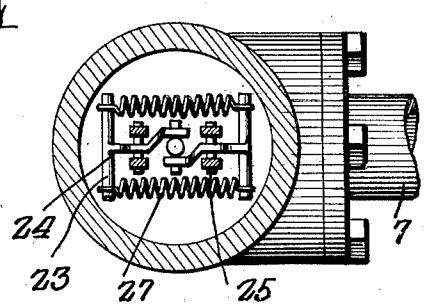


Fig. 3.

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Fig. 4.

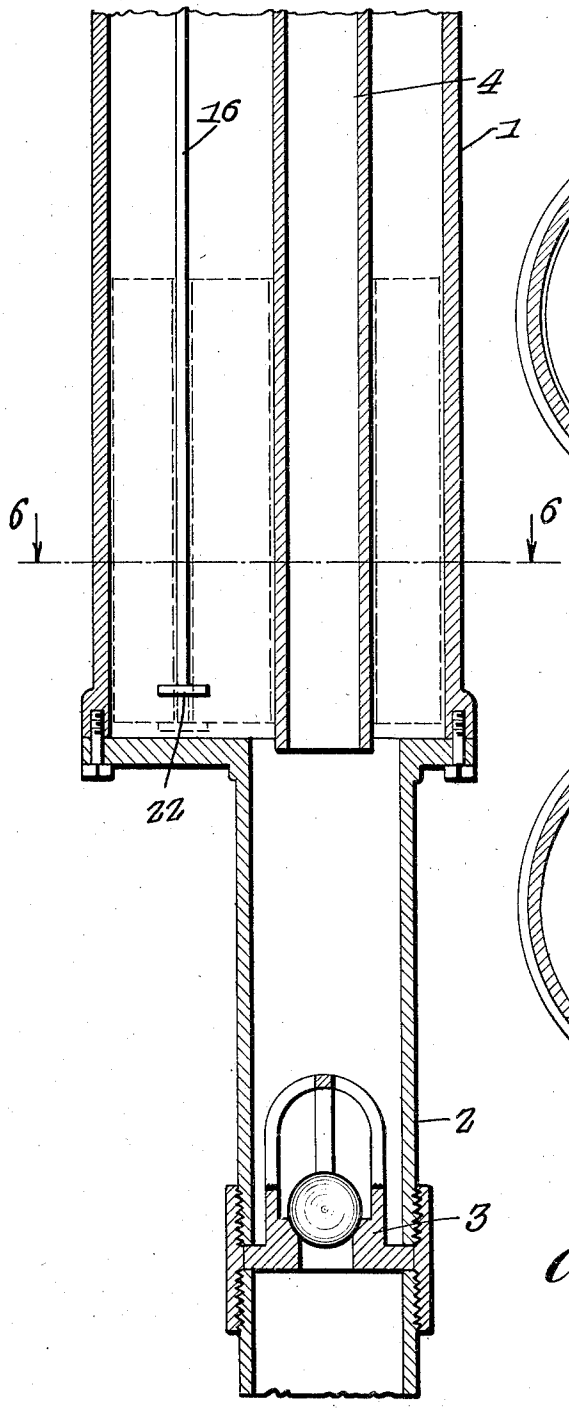


Fig. 5.

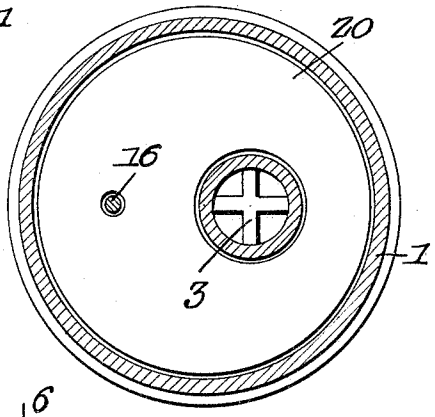
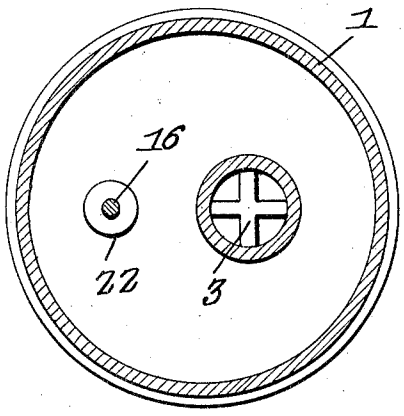


Fig. 6.



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Patented Apr. 8, 1930 1,754,088

UNITED STATES PATENT OFFICE

CHARLES E. FOLLIS, OF ALLEN, OKLAHOMA

PUMP FOR OIL WELLS

Application filed December 10, 1928. Serial No. 325,019.

This invention relates to a pump for oil wells and the like, the general object of the invention being to provide means for introducing compressed gas or air into a part of the pump to force the liquid through the outlet thereof, with float operated valves for controlling the inlet and outlet valves of the pump whereby the liquid flowing into the pump will raise the float and this movement of the float will close the outlet or vent valves and open the inlet valves, which will permit the compressed fluid to enter the pump and force the liquid through the discharge thereof, after which the float will drop and this movement of the float will close the inlet valves, thus cutting off the supply of compressed fluid, and open the vent valves so that the compressed fluid in the pump will escape and the oil or other liquid from the well will enter the pump.

A further object of the invention is to provide means for giving the valves a quick opening and closing movement and such means will also act in conjunction with associated means to complete the opening and closing movements of the valves.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claim.

In describing the invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:—

Figure 1 is a sectional view through the upper part of the pump.

Figure 2 is an enlarged sectional view showing the spring means associated with the inlet valves.

Figure 3 is a section on line 3—3 of Figure 1.

Figure 4 is a sectional view through the lower part of the pump.

Figure 5 is a section on line 5—5 of Figure 1.

Figure 6 is a section on line 6—6 of Figure 4.

In these views, the numeral 1 indicates the barrel of the pump which is provided with a reduced extension 2 in which the standing valve 3 is arranged. The discharge line of the pump is shown at 4, and the lower end of this line extends a slight distance into the extension 2. This line is provided with the standing valve 5. A tubular member 6 is fastened to the upper end of the barrel and its upper end is closed and a supply pipe 7 is connected with this member adjacent its upper end, this pipe being connected with a suitable source of compressed air or gas. A cage 8 is in communicatin with the lower end of the supply line 7 and has upper and lower ports 9 therein which are controlled by a pair of valves 10 arranged on a stem 11 and this stem also carries a pair of valves 12 for controlling the pair of ports 13 arranged in the discharge or vent cage 14 which extends transversely through an opening in the member 6 below the cage 8. The lower end of the stem 11 is formed with a head 15 which extends into a cup-shaped enlargement 16 formed on a float rod 17, this cup-shaped enlargement being closed by a cap 18. The float rod passes through a hole 19 formed in a float 20 which is placed in the pump barrel and which has a large hole 21 therein through which the lower part of the discharge line 4 passes. The float rod 17 is formed with the upper and lower enlargements 22 for causing the float to move the rod at its upward and downward limits of movement.

A pair of T-shaped members 23 have their slotted stems 24 pivoted to each of the stems or rods 11 or 17, with the slots in the stems receiving pins 25 carried by the hangers 26, a set of these hangers depending from the top of the pump barrel and a second set depending from the top of the member 6, the latter pair cooperating with the T-shaped members of the stem 11 and the former pair cooperating with the T-shaped members of the float rod 17. A pair of springs 27 connects each pair of T-shaped members together, as clearly shown in Figure 3.

When the pump barrel is empty, the float

will be in its lowest position and the weight of the float acting on the float rod will cause said rod to pull the valve stem 11 downwardly, thus closing the valves 10 and opening the valves 12 so that the pump barrel is in communication with the atmosphere and the supply of compressed air or gas is cut off. The liquid in the well will enter the pump barrel through the extension 2, thus causing the float to ascend until the float strikes the upper projection 22, which causes the float rod to move with the float. This rod will move to a limited extent before the bottom of its cup-shaped part 16 strikes the head 15 of the stem 11 and during this movement, the T-shaped members 23 which are connected with the float rod will be moved until they pass dead center, when the springs 27 will act to cause said T-shaped members to move toward each other and thus the float rod will be snapped upwardly independently of the float, and this upward movement of the float rod will cause it to engage the lower end of the valve stem to force the stem upwardly, whereby the valves 12 are closed and the valves 10 opened. During this movement of the valve stem, the T-shaped members 23 connected with the stem will be moved beyond dead center so that the valve stem will be given a quick movement upwardly independently of the float rod so that the closing movements of the valves 12 and the opening movements of the valves 10 will be quick ones. The closing of the valves 12 will close communication of the pump barrel with the atmosphere and the opening of the valves 10 will permit the compressed air or gas from the source to flow through pipe 7 into the member 6 and this compressed fluid will pass into the barrel and thus act on the oil or water therein to force the liquid through the discharge 4. The float will move downwardly as the liquid is being forced from the barrel until it strikes the lower projection 22, when the float rod will follow the movement of the float, and this movement of the rod, acting on the valve stem 11, will close the valves 10 and open the valves 12 so that the supply of compressed fluid will be cut off and the compressed fluid in the pump can escape through the outlet or vent and thus liquid will again enter the barrel from the well. Of course, the downward movements of the stem 11 and the float rod 17 are facilitated by the spring means.

As will be seen, with this invention, the compressed fluid is intermittently delivered into the pump barrel and its flow is controlled by the movement of the float under the action of the liquid entering the barrel from the well.

It is thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claim.

What I claim is:—

A pump of the class described comprising a barrel, a lower extension thereon, a discharge pipe extending into the lower part of the barrel, a tubular member in communication with the top of the barrel, said tubular member having a discharge port and an inlet port therein, a supply of compressed fluid connected with the inlet port, a valve stem in the tubular member, valves thereon for controlling the ports, the inlet valve closing its port while the discharge valve is in open position and vice versa, spring means for giving the valve stem a snap action, a float rod actuated by the float at the extremities of movement of the float, spring means for giving the float rod a snap action and a coupling between the float rod and valve stem for preventing movement of the stem by the float rod until the rod has been moved by its spring means.

In testimony whereof I affix my signature.

CHARLES E. FOLLIS.