G. A. HUMASON AND W. E. LANGLEY.

PUMP.

APPLICATION FILED MAR. 5, 1921.

1,409,450.

Patented Mar. 14, 1922.

2 SHEETS—SHEET 1.

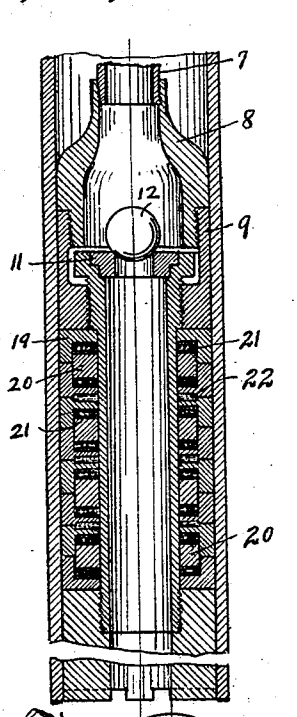


Fig. 3.

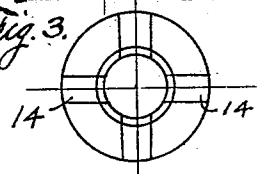


Fig. 4.

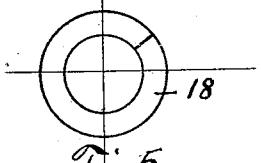


Fig. 5.

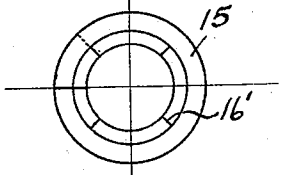


Fig. 6.

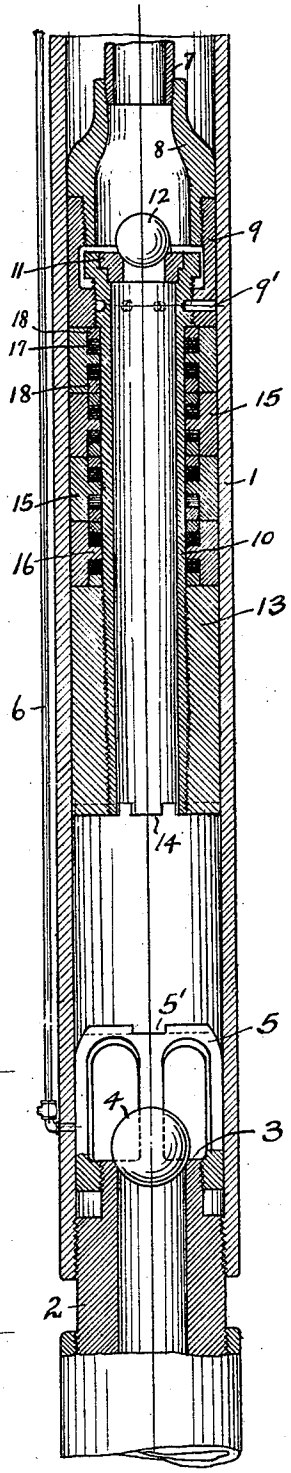


Fig. 1.

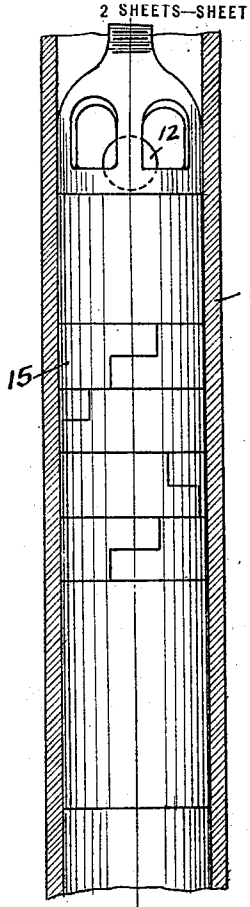


Fig. 2.

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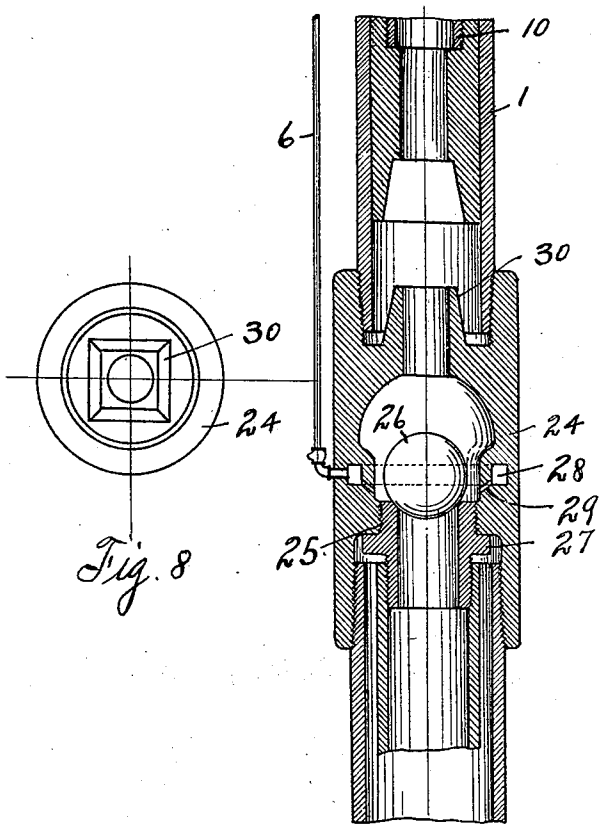


Fig. 8

Fig. 7

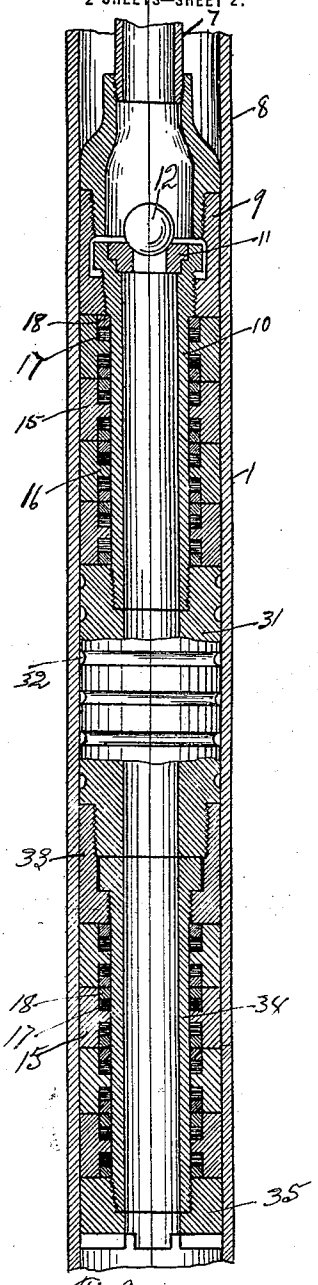


Fig. 9.

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UNITED STATES PATENT OFFICE.

GRANVILLE A. HUMASON AND WILLIAM EDWARD LANGLEY, OF HOUSTON, TEXAS.

PUMP.

1,409,450. Specification of Letters Patent. Patented Mar. 14, 1922.

Application filed March 5, 1921. Serial No. 449,762.

To all whom it may concern:

Be it known that we, GRANVILLE A. HUMASON and WILLIAM EDWARD LANGLEY, citizens of the United States, residing at Houston, in the county of Harris and State of Texas, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

This invention relates to new and useful improvements in a pump and has particular relation to an improved form of pump specially adapted for use in pumping oil from oil wells.

One object of the invention is to provide a pump of the character described having an improved form of plunger, or traveling valve, which will at all times form a close fit in the working barrel to prevent leakage past it.

Another object of the invention is to provide a pump which is so constructed that sand will not collect around the plunger on the wall of the working barrel and cause said plunger to stick in the working barrel or readily wear away.

A further feature is to provide an improved form of plunger specially constructed to prevent sand from collecting between it and the working barrel and wearing the same out.

A still further feature of the invention resides in the provision of a pump equipped with a conduit through which fluid may be forced, under pressure, through the standing valve to keep the same cleansed of sand and other detritus.

With the above and other objects in view the invention has particular relation to certain novel features of construction, operation and arrangement of parts, an example of which is given in this specification and illustrated in the accompanying drawings, wherein:—

Figure 1 is a vertical sectional view of the pump.

Figure 2 is a vertical sectional view, showing the traveling valve in the working barrel.

Figure 3 is a fragmentary vertical sectional view, showing a modified form of plunger.

Figure 4 is a bottom end view of the traveling valve.

Figure 5 is a plan view of a gasket employed.

Figure 6 is a plan view of an expansible ring employed.

Figure 7 is a vertical sectional view of the bottom part of the pump, showing a modified form of standing valve.

Figure 8 shows a plan view of said valve, and

Figure 9 shows another form of plunger.

Referring now more particularly to the drawings, the numeral 1 designates the working barrel. Threaded into the lower end of this barrel, by means of right hand threads, there is a nipple 2 whose upper end is formed into a valve seat 3 which is controlled by the ball valve 4. This valve is confined by the cage 5, which is threaded onto the upper end of the nipple 2. The numeral 6 designates a tubing which leads from the top of the wall down alongside the pump barrel and whose lower end is turned inwardly through said barrel opposite the valve 4. Fluid, such as hot steam, air or water, is forced down through said tubing, under pressure, against the ball valve which keeps the same washed out and cleansed of clogging matter, and the pressure of said fluid through said tubing may be made sufficient to force the oil or other fluid from the well. In the form shown in Figures 1, 2, 3 and 4, a hollow sucker rod 7 is employed by means of which the traveling valve is reciprocated up and down. Threaded onto the lower end of this sucker rod there is the reducing nipple 8 whose lower end is reduced and outwardly threaded to receive the coupling 9 which is threaded thereon. Inserted through this coupling there is a tubular barrel 10 whose upper end is threaded through the coupling 9 by means of left-hand threads. A valve seat 11 is fitted into the upper end of said barrel and is controlled by the ball valve 12 which is confined within the nipple 8. Threaded onto the lower end of the barrel there is an elongated clamp nut 13 and the lower end of the barrel and nut are formed with the aligned downwardly extending projections 24. Fitted onto the barrel 10 are the rings 15 which are preferably formed of a suitable composition and which are expansible, each ring having an internal annular rib 16 centrally located with respect to the ring. This rib has transverse slots 16′ cut therethrough to render the rings more easily contracted. On each side of this rib there is a continuous

non-expansible washer 17 preferably formed of leather or some similar material and which at all times fits closely over the barrel to prevent fluid from leaking past between the barrel and the rings 15, and each washer is backed by means of an expansible metal gasket 18, said gasket lying against the outer sides of the washer 17 of the respective rings. A plurality of these rings 15 are provided and they are clamped in place between the coupling 9 and the nut 13. In assembling the valve, the barrel 10 is threaded through the coupling 9′ and pinned therein by means of the pin 9′ and the nipple 8 then attached to said coupling. The rings, with their washers and gaskets, are then fitted over the tubular barrel and clamped closely around said barrel and held in position by the nut 13 which is screwed tightly against the lower ring to clamp the rings between it and the coupling 9. The pin 9′ holds the barrel against unscrewing from the coupling 9 while the nut 13 is being screwed in place, after which it is removed. The traveling valve is then let down into the working barrel, the projections 14 of the nut 13 and barrel 10 fitting into corresponding grooves 5′ in the top of the cage 5. The sucker rod is then rotated in a right-hand direction. The threads connecting the barrel 10 with the coupling 9 being left-hand threads, when the sucker rod is so rotated they will unscrew, forcing the barrel 10 downwardly and carrying the nut 13 away from the rings 15, which being released, will suddenly expand and will thereafter fit closely within the working barrel and prevent leakage past them. In the form shown in Figure 3, expansible rings 19 are provided, which are formed of composition material and are expansible. These rings are right angular in cross section and the adjacent rings are reversely arranged, as shown. Alternate joints are broken by expansible metallic bands 20 on opposite sides of which are the non-expanding gaskets 21, formed of leather or similar material. The other joints are broken by non-expanding leather gaskets 22. The gaskets 21 and 22 at all times fit closely around the barrel and prevent leakage past between the same and the rings 19 and said gaskets 21 are backed, on each side, by metal washers 23. In the form shown in Figures 7 and 8, a hollow coupling 24 forms the cage for the standing valve and this coupling is provided with the usual valve seat 25 which is controlled by the ball valve 26. This seat is threaded into the coupling from beneath and has a polygonal section 27 to receive a socket wrench. Within this coupling there is an annular chamber 28 which surrounds the valve, and leading from this chamber there are the ducts 29 which terminate within the valve cage underneath the valve. The tubing 6 enters this chamber and the cleansing fluid is forced under pressure down through the tubing through said chamber and thence through the ducts 29 against the valve.

In this form of pump the upper end of the standing valve cage is formed with the projection 30, preferably square in cross section, and the lower end of the traveling valve has a correspondingly shaped socket provided to receive said projection when it it desired to release the rings 15, as hereinbefore explained.

In the form shown in Figure 9, there is a tubular union 31 threaded onto this lower end of the barrel 10 by means of right-hand threads. This union has a plurality of annular peripheral grooves 32 and its lower end is reduced and threaded into the upper end of the nipple 33 by means of right-hand threads, and this nipple is connected to the upper end of the barrel 34 by means of left-hand threads.

In this form the barrels 10 and 34 have the rings 15, the washers 17 and the gaskets 18 as in the form shown in Figure 1, and these are clamped on the respective barrels by means of the union 31 and the clamp nut 35, the latter being threaded onto the lower end of the barrel 34. This form of plunger has also the valve seat 11 at its upper end, controlled by the valve 12 as in the form shown in Figure 1. Any sand passing between the upper rings 15 will collect in the grooves 32 and will not reach the lower rings, and for the same reason any sand working past the lower rings will not reach the upper rings, and the life of the plunger will be thereby materially increased.

What we claim is:—

1. In a pump, a traveling barrel, expansible rings secured thereon, each ring being formed open and having an internal annular rib, a washer on said barrel on each side of the rib and a metallic gasket fitted against the outside of each washer.

2. In a pump, a traveling barrel, expansible rings thereon, said rings being reversely arranged, expansible metallic bands breaking alternate joints between the rings, and non-expanding washers breaking the other joints.

3. In a pump, a traveling barrel, expansible rings thereon, said rings being reversely arranged, expansible metallic bands breaking alternate joints between the rings, and non-expanding washers breaking the other joints, a non-expanding washer on each side of each band, and a metallic gasket on each side of each washer.

4. In a pump, a plunger having two sets of expansible packing rings spaced apart and a connecting member having annular peripheral grooves, and arranged between the sets of packing rings.

5. In a pump, a plunger having two barrels, a connecting union having peripheral grooves and connecting said barrels, expansible packing rings on each barrel, and a valve controlling the flow of fluid through said plunger.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

GRANVILLE A. HUMASON.
WILLIAM EDWARD LANGLEY.

Witnesses:
WM. A. CATHEY,
LORENA FAHRENTHOLD.