R. GREGORY.

OIL WELL PUMP.

APPLICATION FILED AUG. 30, 1919.

1,326,338.

Patented Dec. 30, 1919.

Fig. 1.

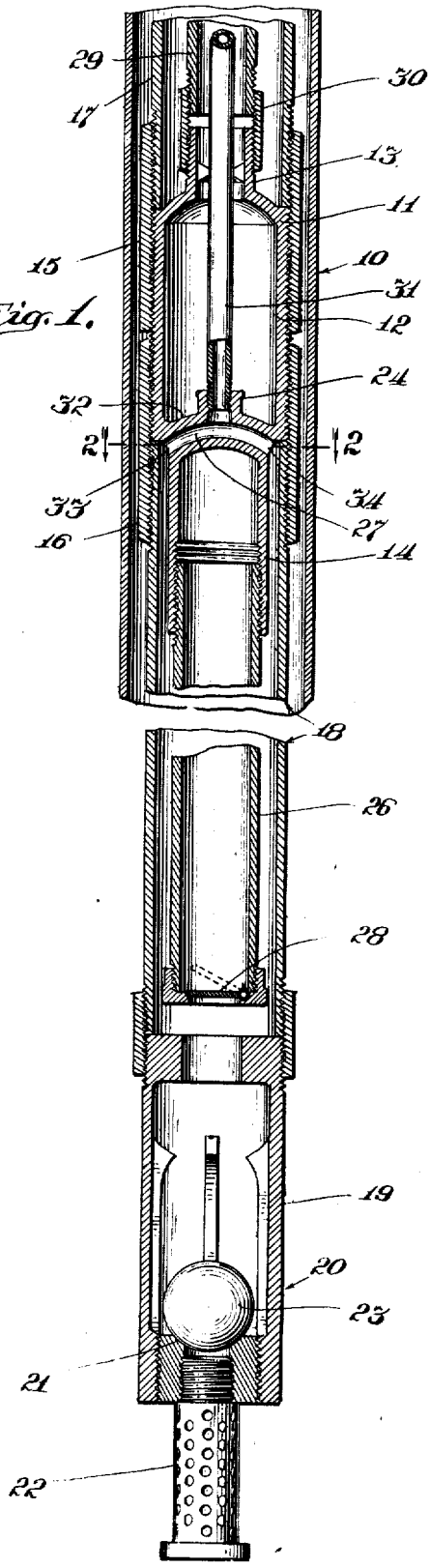
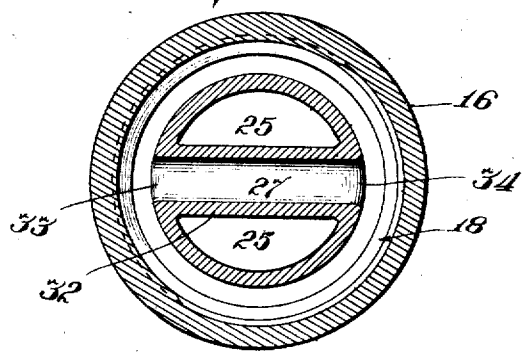


Fig. 2.



Inventor

Ralph Gregory.

By Gillson & Gillson

Attorneys.

UNITED STATES PATENT OFFICE.

RALPH GREGORY, OF KANSAS CITY, MISSOURI, ASSIGNOR TO OIL WELL RECLAMATION COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

OIL-WELL PUMP.

1,326,338. Specification of Letters Patent. Patented Dec. 30, 1919.

Application filed August 30, 1919. Serial No. 320,910.

To all whom it may concern:

Be it known that I, RALPH GREGORY, a citizen of the United States, and resident of Kansas City, county of Jackson, and State of Missouri, have invented certain new and useful Improvements in Oil-Well Pumps, of which the following is a specification and which are illustrated in the accompanying drawings, forming a part thereof.

The invention relates to pumps for lifting liquids by compressed air, and especially to those which are intended to be utilized in pumping oil from wells.

The invention contemplates a pump which is self-contained, meaning thereby that all of its parts are independent of the casing of the well within which it is used; and the object of the invention is to provide such a pump which is of simple and improved construction, having particular reference to the facility with which the parts are assembled during the operation of setting the pump in the well, and the provision made for supporting the weight of the long lengths of pipe which enter into the construction without unduly restricting the passages of the pump to the free movement of fluid.

In the accompanying drawings—

Figure 1 is a central vertical sectional view showing one form of the improved pump with a detail of the surrounding well casing; and

Fig. 2 is a horizontal sectional view taken on the line 2—2 of Fig. 1, the well casing being omitted.

As the parts of the pump are necessarily limited in size in cross-section to permit of their being entered in a well casing, as 10, the pump barrel 18 is preferably of great length to afford large capacity. In practice this pump barrel will usually extend to a point near the bottom of the well and will have a foot valve 20 at its lower end. As shown, the foot valve 20 takes the form of a ball check comprising a tubular valve casing 19, coupled to the lower end of the pump barrel 18, ball 23 mounted within the casing 19, and an apertured seat 21 for the ball at the lower end of the casing. If desired a perforated pipe 22, constituting a filter, may be connected with the valve seat 21 to extend below the same.

Within the pump barrel 18 is mounted a discharge pipe 26, through which the fluid content of the pump barrel is elevated by compressed air acting after each filling of the barrel upon the top of the fluid column contained therein. To prevent return of the fluid into the pump barrel from the discharge pipe 26, the latter is provided with a check valve 28 at its lower end.

In the arrangement shown, the remaining elements of the pump include a pipe 17 for supporting the weight of the pump barrel 18 within the well, an uptake 29 forming a continuation of the discharge pipe 26 and preferably extending to the top of the well, a compressed air supply pipe 31, and a coupling member, generally designated 11. As the coupling member 11 is relied upon for uniting the pipes 26 and 29, it is preferably formed with a tubular body 12, having threaded nipples 13 and 14 at its opposite ends. As shown, the nipple 14 is internally threaded for direct connection with the upper end of the discharge pipe 26, while the nipple 13 is externally threaded and is connected to the lower end of uptake pipe 29 by a union 30.

The coupling member 11 is also relied upon for providing a firm connection of the pump barrel 18 with the supporting pipe 17. For this purpose the tubular body portion 12 of the said coupling member is preferably threaded upon the outside of the same throughout its length, and a pair of unions 15 and 16 are externally engaged with the body portion of the coupling 11 and with the supporting pipe 17 and the pump barrel 18, respectively.

The compressed air supply pipe 31 may be of relatively small diameter and extends from the top of the well centrally through the pipe 29 to the lower end of the body portion 12 of the coupling member 11. As the admixture of air with crude petroleum is believed to reduce the value of the latter, probably by stimulating the evaporation of some of its more volatile constituents, it is found desirable to employ the compressed air supplied through pipe 31 only for direct displacement of the fluid contained in the pump barrel 18. The lower end of the air pipe 31 is accordingly entered in a threaded nipple 24, the bore of which communicates with the bore 27 of a tubular bridge-piece 32 formed in the lower end of the body portion 12 of the coupling member 11, with

ports 33, 34, opening into the upper end of the pump barrel 18 at opposite sides of the nipple 14. As the bridge-piece 32 is desirably of reduced width as compared with the diameters of the bores of the nipple 14 and body 12 of the coupling member 11, openings 25 (Fig. 2) at each side of the said bridge-piece provide ample room for the passage of fluid about the bridge-piece in the upward travel of the fluid from the discharge pipe 26 through the bore of the coupling member 11 to the uptake pipe 29.

It will be understood that compressed air is only to be supplied through pipe 31 when the pump barrel 18 has been filled with fluid and it is desired to discharge the same either at the top of the well or into a companion pump barrel (not shown) located at a higher level. Furthermore, while the pump barrel 18 will in some cases be filled with fluid by the natural flow of the well into the well casing 10, and upwardly through the foot valve 20 when pipe 31 is open at its upper end (not shown) to the atmosphere, it will frequently be desirable to induce the filling of the pump barrel 18 by exhausting the same through pipe 31. It is therefore contemplated that the apparatus herein shown may be used in conjunction with the oil well pumping apparatus forming the subject of my application for patent filed January 20, 1919, Serial No. 272,152.

While the uptake pipe 29 contains fluid which would otherwise be confined by the supporting pipe 17, the use of this smaller uptake pipe is desirable since during the assembly of the parts it serves to guide the small air pipe 31 through the nipple 13 and into the nipple 24. Similarly, when both the supporting pipe 17 and the uptake pipe 29 extend to the top of the well the weight of the parts is borne by both of these pipes and either one of them may be omitted when the other is found to have sufficient strength for the purpose. Any other suitable fluid under pressure may be used instead of the air referred to herein.

I claim as my invention—

1. In a pump, in combination, a cylindrical main body having upper and lower extensions of smaller diameter than said body, a cylinder pipe projecting below said main body surrounding said lower extension, an intake pipe attached to said lower extension and having a check valve at its lower end, a discharge pipe attached to said upper extension, and means to admit air under pressure to said cylinder exterior of said uptake pipe.

2. In a pump, in combination, a cylindrical main body having a reduced intake pipe extension at its lower portion, a cylinder attached to and forming a practical continuation of the walls of said body, surrounding said intake pipe, a discharge pipe extending upwardly from said body, an air pipe located in the interior of said discharge pipe and body, and lateral branches from said air pipe to said cylinder.

RALPH GREGORY.

Correction In Letters Patent No. 1,326,338.

It is hereby certified that the State of incorporation of the assignee in Letters Patent No. 1,326,338, granted December 30, 1919, upon the application of Ralph Gregory, of Kansas City, Missouri, for an improvement in "Oil-Well Pumps," was erroneously given as "Illinois," whereas said State should have been given as *Delaware*, as shown by the record of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 3d day of February, A. D., 1920.

[SEAL.]

M. H. COULSTON,

Acting Commissioner of Patents.

Cl. 103—8