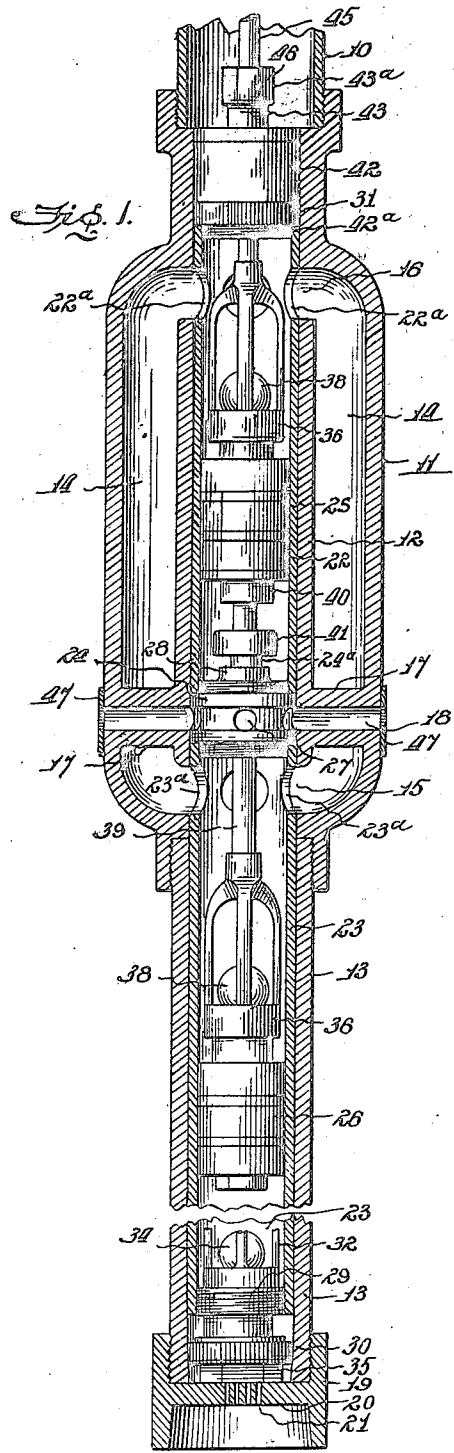
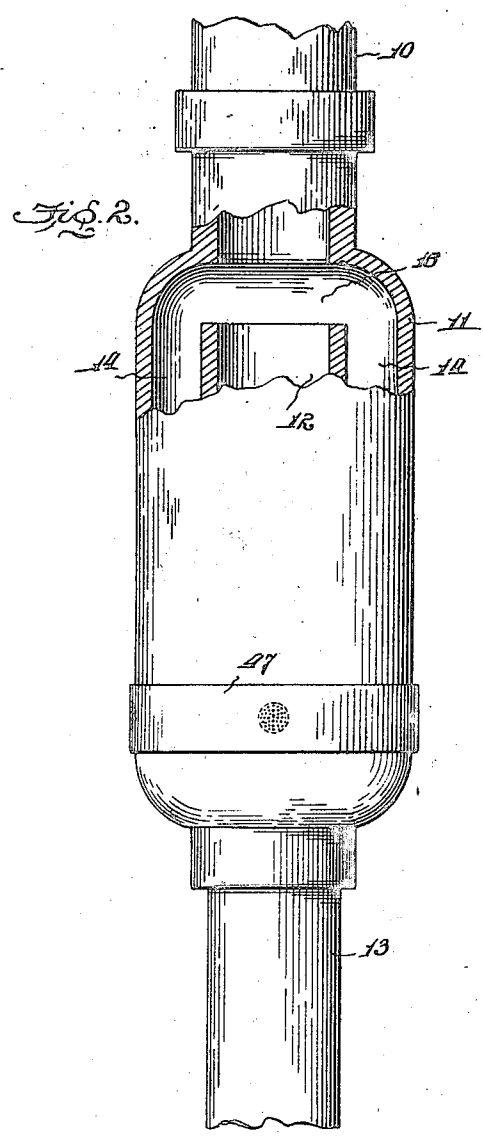


1,435,837.

Patented Nov. 14, 1922.
2 SHEETS—SHEET 1.



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APPLICATION FILED MAR. 18, 1922.

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2 SHEETS—SHEET 2

1,435,837.

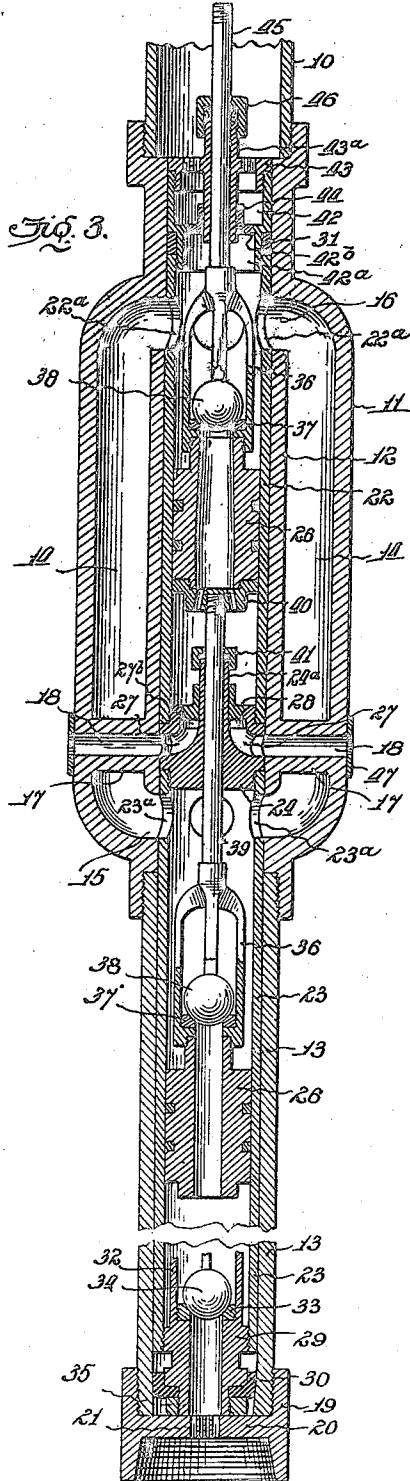


Fig. 4.

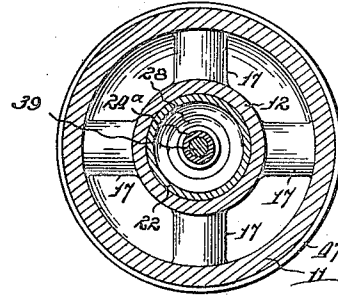


Fig. 5.

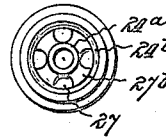


Fig. 6.

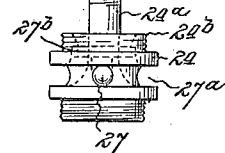


Fig. 7.

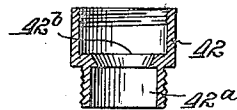


Fig. 8.

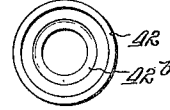
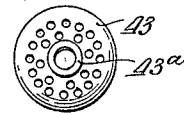


Fig. 9.



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UNITED STATES PATENT OFFICE.

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Application filed March 18, 1922. Serial No. 544,880.

To all whom it may concern:

Be it known that I, ALFRED GEDDES, a citizen of the United States, residing at Bradford, in the county of McKean and State of Pennsylvania, have invented a Pump, of which the following is a full and complete specification.

My invention is an improvement in that particular class of pumps which are especially designed for use in pumping oil from oil-wells, and in which a working-barrel is attached to the lower end of the well-tubing to form an extension thereof and receives the piston operated by a rod extending up through the tubing.

The primary object of my invention is to provide a pump of this character in which the pumping capacity is greatly increased without increasing the relative size of the pumping-barrels and pistons, permitting the use of standard pistons and valves.

A further object of my invention is to provide a pumping mechanism for oil-wells which may be readily and conveniently removed from the working-barrels at the lower end of the tubing for examination and repair of the valves and other parts thereof, and when seated in said working-barrels will be firmly held in place and therefore not affect the pumping operation.

These principal objects are attained in the present instance by providing a pump comprising two pistons working one above the other with a casing to contain the upper barrel and having a by-pass around the same, in connection with an arrangement of valves by which the oil will be drawn into the lower ends of both piston-chambers or barrels and discharged from their upper ends into the well tubing on the upstroke of the pistons, each downstroke of the latter forcing the oil from the lower ends of said barrels through the pistons into the upper ends thereof; whereby double the quantity of oil is discharged than by the use of a single piston.

In the following specifications I have described the construction and operation of my improved oil-well pump, and what I particularly claim as my invention, and desire to protect by Letters-Patent is more specifically set forth in the appended claims.

In the accompanying drawings:

Fig. 1 is a vertical sectional view through

the pump-barrels and casing, showing the pumping mechanism in side elevation.

Fig. 2 is a side elevation of the casing with the upper part thereof broken away to show the barrel.

Fig. 3 is a vertical sectional view through the casing, pump-barrels, and pumping mechanism.

Fig. 4 is a transverse sectional view on the line 4—4 of Fig. 3.

Figs. 5 and 6 are detail views of one of the valved couplings.

Figs. 7, 8 and 9 are details of the valved coupling at the upper end of the casing.

In carrying out my invention there is attached at the lower end of the well-tubing an open-ended casing 11 which includes the upper pump-barrel 12 of the pumping mechanism and to which the lower barrel 13 is attached on a line with the upper barrel, said casing in the present instance being formed with the pump-barrel 12 at the center thereof to provide a surrounding space or chamber 14 through which the oil from the lower barrel passes into the well-tubing by way of openings 15 and 16 at opposite ends of said upper barrel. The openings through the reduced upper and lower ends of the casing correspond with the internal diameter of both pump-barrels, and as the upper barrel 12 terminates near the ends of the casing to provide the afore-mentioned openings 15 and 16 it is supported from the body of the casing by tubular connections 17 providing passages 18 leading from the well to said pump-barrel. The oil enters the lower barrel 13 through a coupling 19 threaded on the lower end thereof and having a transverse wall 20 forming a seat for the pumping mechanism and provided centrally with holes 21 through which the oil passes into the pump-barrel.

The pumping mechanism fits within the upper and lower barrels 12 and 13 and includes brass linings 22 and 23 for said barrels, respectively, said linings being connected by a valved coupling 24 which separates the piston-chambers for independent action of the pistons 25 26 in lifting the oil and is located on a line with the inlet openings 18 through the casing and has ports 27 through the same to the upper pump-barrel or piston-chamber so that oil will be drawn into the latter on the upstroke of piston 25,

a check-valve 28 operating to close said ports on the downstroke of said piston. The coupling 24 is located in this position with the standing-valve 29 at the lower end of the pumping mechanism resting on the transverse wall 20 of coupling 19 at lower end of barrel 13, said standing-valve having a cup-shaped packing 30 cooperating with a packing 31 at the upper end of the pumping mechanism to hold said mechanism or aforementioned linings thereof in place.

The standing-valve is of the usual type, having a cage 32 with removable valve-seat 33 for the ball 34, the cup-shaped packing 30 being held in place at the lower end thereof by a clamping-nut 35. This standing-valve is threaded into the lower end of the lining 23 and projects beyond the same so that the packing may intimately engage the pump-barrel which is slightly tapered internally at this point, and said packing being cup-shaped will more effectively cooperate with the ring-packing 31 at the upper end of the barrel-linings to hold said linings firmly in place against movement on the upstroke of the pistons in the operation of the pump.

The pistons 24 and 25 are of a standard type, and therefore a description of one will apply also to the other, like numerals of reference being employed, for each has threaded on its upper end a cage 36 preferably with a removable seat 37 for the ball 38, said pistons being connected by a rod 39 threaded into the upper end of the cage on the lower piston and into a flanged-nut 40 on the lower end of the upper piston, the nut having holes leading into the bore through said piston. The connecting-rod 39 passes through a central opening in the valved-coupling 24, and the stem 24^a of the latter—on which the check-valve 28 works—has threaded on its upper end a gland-nut 41 embracing said connecting-rod to prevent the escape of oil from one piston chamber to the other.

As will be noted the oil from the well will pass into the lower piston-chamber or inner-lined pump-barrel 13 by way of the lower end of the pump through the standing-valve 29 and into the upper piston-chamber or inner-lined pump-barrel 12 from the sides of the casing 11 through the valved coupling device 24, and in the present instance the oil lifted by both pistons passes out through a coupling device located in the opening through the reduced upper end of casing 11. This last mentioned coupling is in the form of a cylindrical casing 42 with a perforated cap 43 threaded in the upper end thereof, said casing having a reduced threaded portion 42^a at its lower end for attachment to the upper end of the barrel-lining 22 and an annular inner wall 42^b to provide a seat for a check-

valve 44; while the cap 43 has a central tubular stem 43^a through which the pump-ing-rod 45 passes for connection to the upper piston and on the lower portion of which the check-valve 44 works.

Inasmuch as the ports 27 in the valved-coupling 24 extending from the sides thereof through the valve-seat 24^b at its upper end may not register horizontally with the inlet-openings 18 through casing 11 when the pumping mechanism is inserted in the pump-barrels I provide said coupling device with a circumferential recess 27^a at the lower ends of said ports, and to insure a proper seating of check-valve 28, there is an annular undercut recess 27^b below its seat around stem 24^a; and to screen the oil entering passages or inlet-openings 18 I provide a band 47 around casing 11 perforated on a line with said inlet openings, or wire mesh may be employed.

The operation of the pump will be readily understood from the foregoing description; for, as hereinbefore stated, the oil enters both piston-chambers at the lower ends thereof on the upstroke of the pistons and is also forced up into the well-tubing 10 through valve 42 on the upstroke of said pistons—the oil from the upper barrel or piston-chamber being forced directly upward while the oil from the lower barrel or piston-chamber goes around the upper barrel by way of the by-pass 14. On the downstroke the oil is forced through the pistons from the lower ends of the cylinders to the upper ends thereof. In this manner each working stroke or lift of the pump discharges a double quantity of oil.

It will be also understood that when it is necessary to examine or renew any of the working parts of the pumping mechanism the connected linings with the standing-valve at the lower end thereof are removed by means of the sucker-rods, as usual, leaving the casing and lower pump-barrel at the lower end of the well-tubing undisturbed. Furthermore, the entire pumping arrangement shown may be easily installed in a well by simply lowering the same in the hole to the desired depth.

Having described my invention, I claim:

1. A pump comprising a casing having a pump-barrel and a by-pass for passage of liquid around said barrel from bottom to top thereof, a pump-barrel connected to the lower end of the casing in vertical alinement with the aforementioned pump-barrel and communicating with the by-pass at the lower end thereof, a valve interposed between the pump-barrels and having an opening therethrough, a valve at the upper end of the upper barrel with an opening therethrough, and a standing-valve at the lower end of the lower pump-barrel; together with pistons working in the pump-barrels and

connected by a rod passing through the interposed valve, and a pumping-rod connected to the upper piston and passing through the upper valve.

5 2. A pump comprising a casing having a pump-barrel and a by-pass at the side of the same to provide a passage for liquid around said barrel from bottom to top, and a pump-barrel connected to the lower end of the
10 casing in alinement with the aforementioned barrel and communicating with the by-pass at the lower end thereof, the casing having inlet-openings from its sides into the pump-barrel enclosed in said casing; together with
15 linings for the barrels, a valved coupling connecting said linings, a standing-valve at the lower end of the connected linings and a valve at the upper end of said connected linings.

20 3. A pump comprising a casing having a pump-barrel with a by-pass at the side of the same to provide a passage around said barrel from bottom to top, and a pump-barrel connected to the lower end of the casing
25 in alinement with the aforementioned barrel and communicating with the by-pass at the lower end thereof, said casing having inlet-openings from its sides into the barrel enclosed in said casing; together with linings
30 for the barrels, a valved-coupling connecting said linings with an opening therethrough, a standing-valve at the lower end of the connected linings, a valved coupling at the upper end of the connected linings
35 with an opening therethrough, and pistons in the inner-lined barrels connected by a rod passing through the interposed valved-coupling and operated by a rod passing through the opening in the upper valve,
40 substantially as shown and described.

4. A pump comprising a casing having a pump-barrel with a by-pass at the side of the same to provide a passage around said barrel from bottom to top, and a pump-barrel connected to the lower end of the casing in alinement with the aforementioned

barrel and communicating with the by-pass at the lower end thereof; together with linings for the barrels connected together by an interposed valved coupling, a standing-valve at the lower end of the connected linings with a cup-shaped packing to engage the lower pump-barrel, and a valved coupling at the upper end of the connected linings having a ring-packing engaging the
50 sides of the opening in the upper end of the casing, to hold the linings in the pump-barrels; and pistons working in the inner-lined barrels.

5. A pump comprising a casing having a pump-barrel with a by-pass at the side of the same to provide a passage around said barrel from bottom to top and inlet openings extending from the sides of the casing into said barrel, and a pump-barrel connected to the lower end of the casing in alinement with the aforementioned barrel and communicating with the by-pass at the lower end thereof; together with linings for the barrels connected together by a
60 valved coupling located on a line with the inlet openings through the casing to connect said inlet openings with the upper barrel, said valved-coupling having a central opening therethrough, a standing-valve at the
65 lower end of the connected linings having a cup-shaped packing engaging the lower pump-barrel, and a coupling at the upper end of the connected linings having a check valve and a packing the latter engaging the
70 wall of the opening through the upper end of the casing above the upper barrel, said last mentioned coupling having a tubular stem on which the check-valve works; and valved pistons working in the pump-barrels and
75 connected by a rod passing through the interposed valved coupling with the pumping rod connected to the upper piston passing through the tubular stem of the upper valve, substantially as shown and for the purpose
80 set forth.

ALFRED GEDDES.