Sept. 27, 1932. A. GEDDES 1,879,178

OIL WELL PUMP

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Fig. 1.

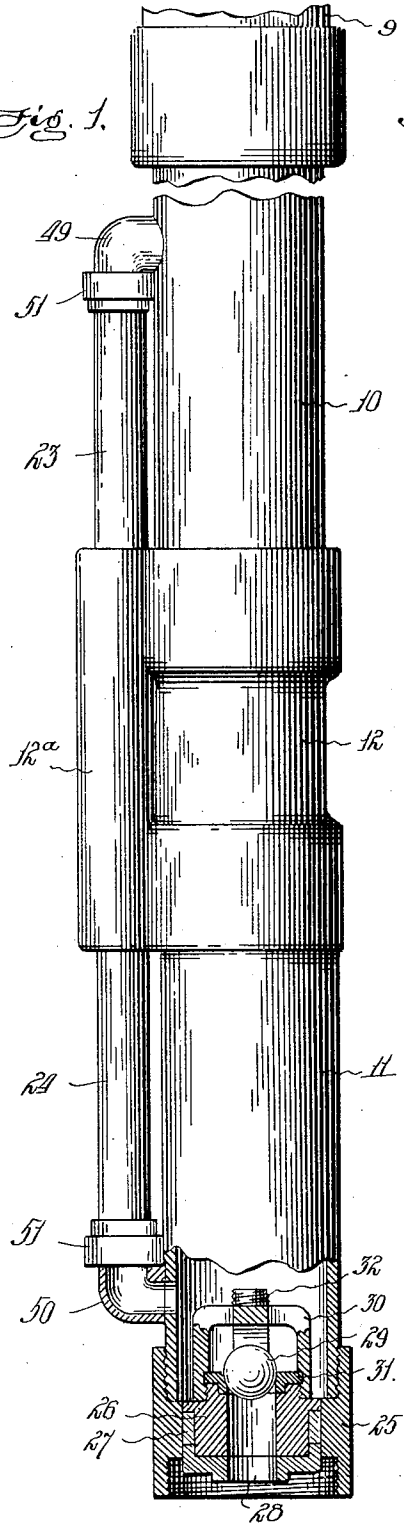
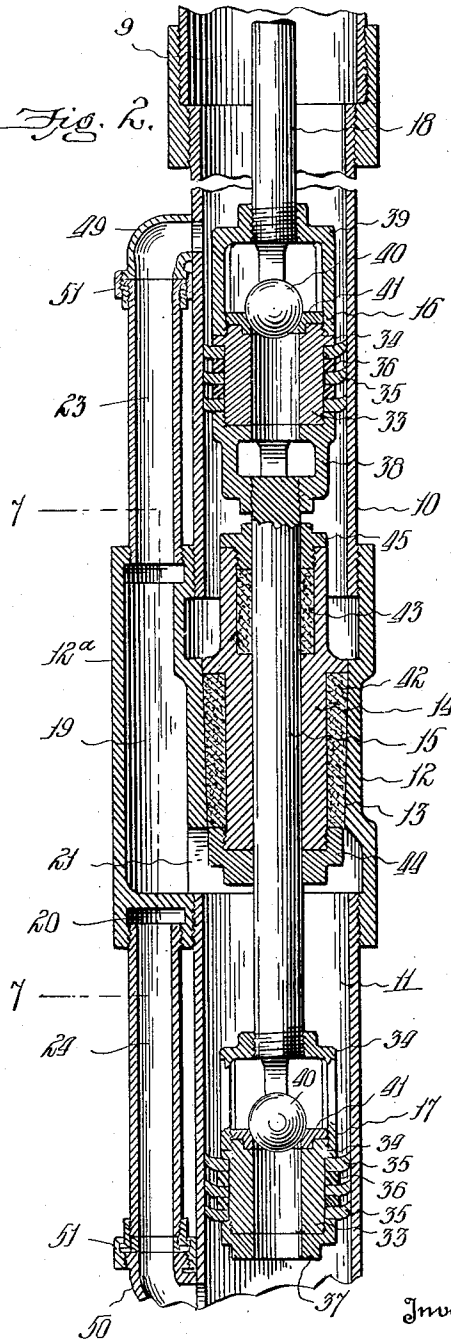


Fig. 2.



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Fig. 3.

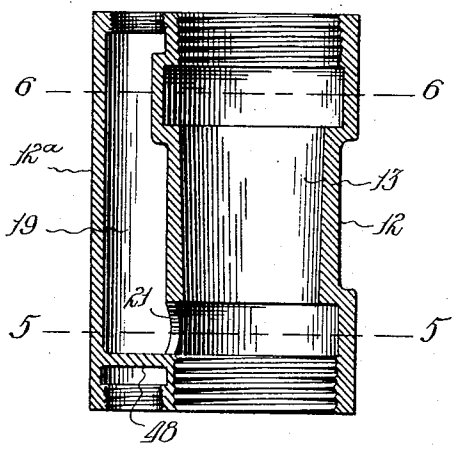


Fig. 4.

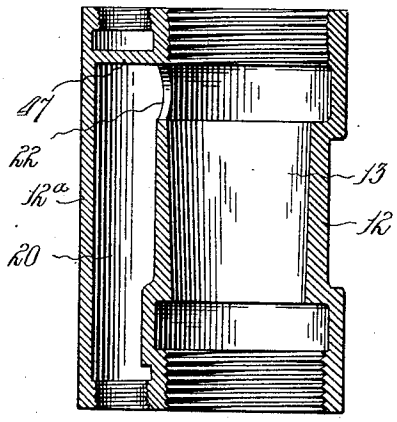


Fig. 5.

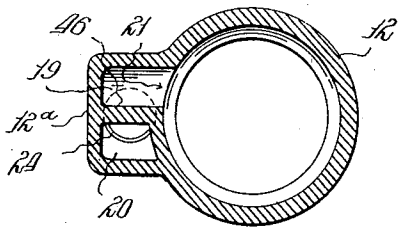


Fig. 6.

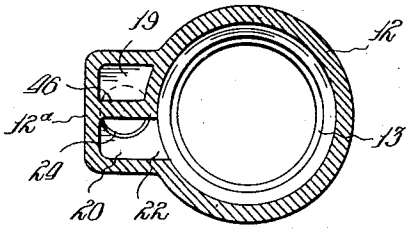


Fig. 7.

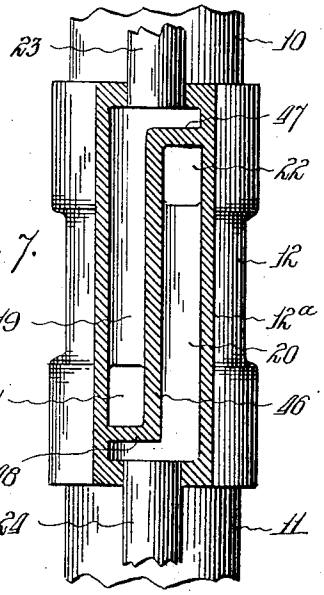
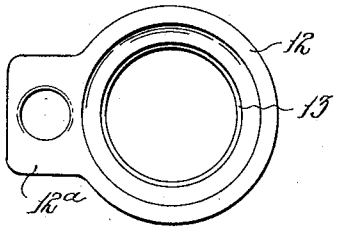


Fig. 8.



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UNITED STATES PATENT OFFICE

ALFRED GEDDES, OF BUFFALO, NEW YORK

OIL WELL PUMP

Application filed February 24, 1930. Serial No. 430,945.

My invention is an improvement in well pumps and relates more especially to an apparatus of this general character used in pumping oil from an oil well.

The primary object of my invention is to provide a particular form of pumping apparatus having double cylinders or pumps on a line with each other with passages leading around a stuffing box intermediate the pump barrels whereby to increase the flow of oil from the pump over the capacity of a standard single pump.

With this principal object in view my invention contemplates the construction of an oil well pump in which the separated and alined pumps are connected in such manner that they will draw the oil through the standing valve and into the lower ends of both pump barrels simultaneously and force the oil above the pistons into the well tubing on the upstroke of said pistons, the downstroke operating to force the oil accumulated in the lower ends of the pump barrels through the valved pistons into the upper ends of said pump barrels, the opposite ends of the pump barrels being connected by passages which conduct the oil past the stuffing box separating the pumps, said passages being formed in the present instance by a coupling to receive the stuffing box and having bypasses with pipe connections to the pump barrels; all as hereinafter fully described and more specifically set forth in the appended claims.

In the drawings:

Figure 1 is a side elevation of my improved oil well pump, with parts broken away to show the standing valve.

Fig. 2 is a longitudinal vertical sectional view through the pumping apparatus.

Figs. 3 and 4 are detail sectional views through the coupling in which the stuffing box is seated.

Fig. 5 is a transverse sectional view on the line 5—5 of Fig. 3.

Fig. 6 is a similar view on the line 6—6 of Fig. 3.

Fig. 7 is a sectional view on the line 7—7 of Fig. 2, and

Fig. 8 is an end view of the coupling.

Referring to the drawings 10 and 11 designate the upper and lower barrels of the pump between which is interposed a coupling 12 having a tapered seat 13 for a stuffing box 14 through which a piston rod 15 passes for connecting the upper and lower pistons 16 and 17 which work in the aforesaid barrels and are operated by a sucker rod 18 extending to the top of the well, said coupling in addition to supporting the stuffing box having bypasses 19 and 20 communicating with the adjoining ends of the pump barrels by openings 21 and 22 and with the further ends of said pump barrels by pipes 23 and 24, as hereinafter more particularly described.

At the lower end of the pump barrel 11 is a coupling 25 (Fig. 1) supporting a standing valve 26 comprising a body portion around which is a packing 27 held in place by a gland nut 28, said valve being of the ball-type with the ball 29 confined within a cage 30 and seating on a hard metal ring 31, the cage in the present instance being provided at its upper end with a threaded lug 32 for removing the standing valve by means of a fishing tool, for which purpose said valve is in frictional engagement with the coupling. The lower end of this coupling is threaded for attachment of the anchor pipe (not shown) which is usually employed in connection with oil wells to locate the standing valve and pumps at the proper depth from the bottom of the well.

As the pistons in the upper and lower barrels are similar in construction a description of one will apply to the other, like numerals of reference being used in designating like parts of each which consist of a body portion 33 having a circumferential projection or shoulder 34 at its upper end below which are

packing and spacing rings 35 and 36 held in place by a gland nut 37 on the lower piston and a gland nut 38 on the upper piston, the latter being in the form of a coupling for the connection of the upper end of the piston rod 15 thereto, and each piston provided with a cage 39 which holds the ball 40 and valve seat 41 in place on the body portion. The lower end of the piston rod is threaded in the upper end of the cage on the lower piston and the sucker rod is threaded in the upper end of the cage on the upper piston whereby the pistons are connected together for operation by the sucker rod, and as will be noted the upper and lower pistons operate above and below the stuffing box 14, the latter having an external packing 42 tapered to fit seat 13 in the coupling 12 and an internal packing 43 through which the piston rod passes, said packings being held in place by gland nuts 44 and 45 respectively. The stuffing box closes direct communication between the pump barrels so that the oil drawn from the well through the standing valve by the strokes of the pistons passes from the opposite ends of the lower barrel to the corresponding ends of the upper barrel through the by-passes and pipe connections, that is the upper end of the lower barrel is connected by opening 21, by-pass 19 and pipe 23 to the upper barrel above the piston working therein and the lower end of said lower barrel above the standing valve is connected by pipe 24, by-pass 20 and opening 22 to the lower end of the upper barrel, the latter being connected to the well tubing 9 extending to the top of the well.

The particular construction of the coupling 12 is illustrated on sheet 2 of the drawings from which it will be noted that the seat 13 is in the body portion thereof on a line with the upper and lower pump barrels to receive the stuffing box 14 passed down through the upper barrel which may be and preferably is slightly larger in diameter than the lower barrel, said body portion of the coupling having an extension 12*a* at one side in which the by-passes 19 and 20 are formed by an intermediate wall 46 having upper and lower offsets 47 and 48 spaced from the pipes 23 and 24 as shown in Fig. 7, pipe 23 connecting by-pass 19 to the upper barrel being coupled to the latter by elbow 49 while pipe 24 connecting by-pass 20 to the lower barrel is coupled thereto by elbow 50, said elbow couplings being welded to the pump barrels and each provided with a packing joint 51 of any approved type.

As hereinbefore explained the alined pumps are separated by a closure in the form of a stuffing box through which passes the rod connecting the pistons of the pumps, and the by-passes for conducting the oil around said stuffing box are so arranged that both pumps will serve to lift oil out of the well thereby increasing the flow to double capacity, for the oil is drawn into the lower ends of both pump barrels on the upstroke of the valved pistons—entering the lower barrel directly from the standing valve and into the upper barrel through pipe 24, by-pass 20, and opening 22 in the upper end of the coupling—and simultaneously the oil above the pistons is forced into the well tubing 9 directly from the upper pump-barrel and from the lower pump barrel by way of opening 21 in the coupling leading to by-pass 19 therein and on through pipe connection 23 to the upper end of the upper pump barrel above the piston therein; in other words the lifting stroke of the pistons in discharging the oil from the well also creates a suction which draws the oil into the lower pump barrel from which some of the oil is drawn around the stuffing box through the lower pipe connection and by-pass connecting therewith into the lower end of the upper pump barrel, the valves in the pistons being closed during this operation, and on the down stroke said valves open to permit the oil in the lower ends of the pump barrels to pass into the upper ends thereof from which it is forced upward into the well tubing on the upstroke.

From the foregoing description of the construction and operation of my improved oil well pump it will be obvious that I not only provide an arrangement in which the parts can be conveniently assembled to be substantial in use but also provide for an effective operation by which the two cooperating pistons increase the capacity of the pump.

I claim:—

1. A coupling for the pump barrels of a double piston oil well pump comprising a body portion having an integral extension at one side the length of the coupling, the body portion being provided centrally with a stuffing box and internally threaded at the ends of said body portion to receive the pump barrels, vertical and horizontal walls in the vertical extension at one side of the coupling forming by-passes communicating respectively with the opposite ends of the body portion of the coupling and with openings at the opposite ends of the extension, said openings being threaded to receive pipes connecting the coupling with the pump barrels.

2. An oil well pump comprising spaced apart aligned pump barrels and valved pistons working therein, a coupling interposed between said pump barrels and having an extension at one side with openings through the opposite ends thereof, vertical and horizontal walls in the extension forming suction and discharge by-passes one opening in the upper end of the coupling and the other into the lower end thereof with openings in the ends of the extension communicating with said by-passes respectively, a plug in the body portion of the coupling through which the piston

rod connecting the pistons passes, a pipe at one side of the lower pump barrel connecting the lower end of said pump barrel to the suction by-pass in the coupling communicating with the lower end of the upper pump barrel, and a pipe at one side of the upper pump barrel connecting the upper end of said pump barrel to the discharge by-pass in the coupling communicating with the upper end of the lower pump barrel; together with a standing valve controlling the flow of oil into the lower pump barrel.

ALFRED GEDDES.