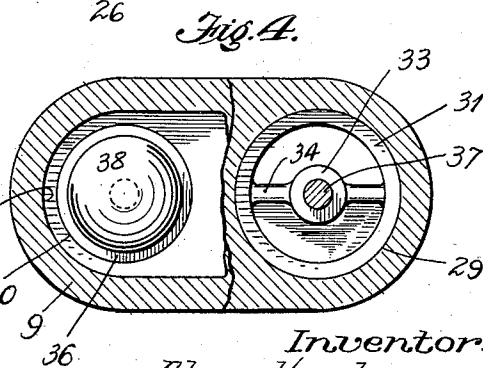
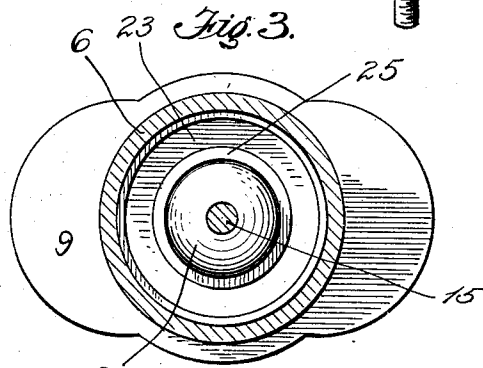
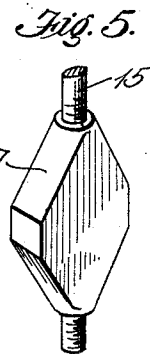
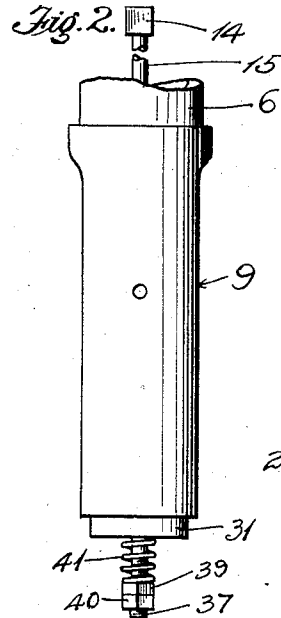
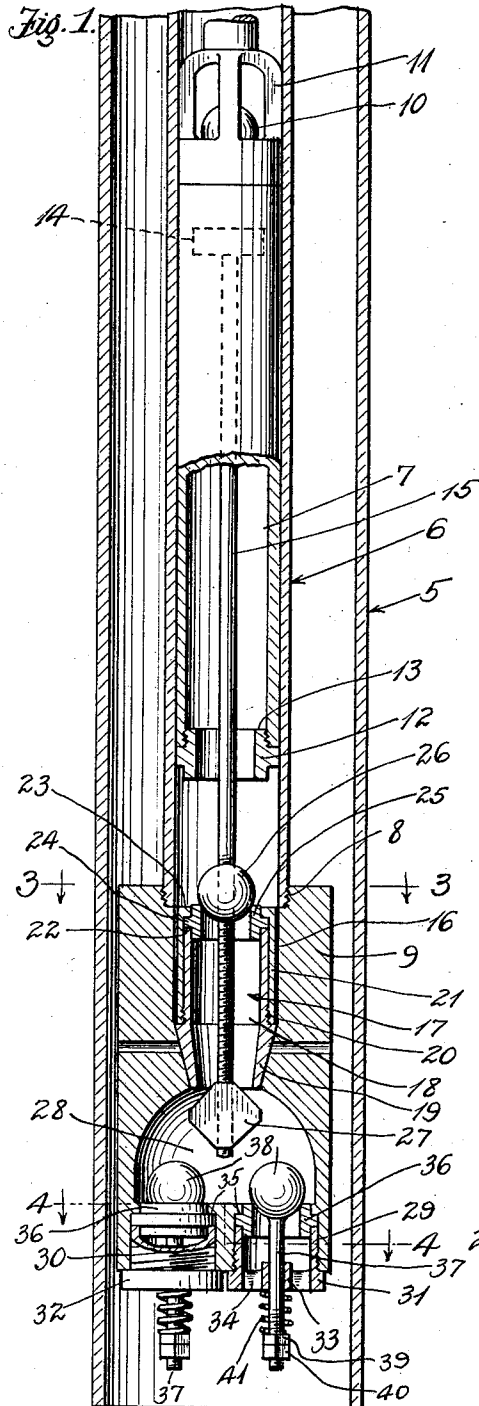


A. HUNTER.
STANDING VALVE CONSTRUCTION FOR WELL PUMPS.
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1,049,719.

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Witnesses:
E. P. Ward
E. Stadlman

Inventor:
Alva Hunter.
by
Harold Thouse,
Attys.

UNITED STATES PATENT OFFICE.

ALVA HUNTER, OF BAKERSFIELD, CALIFORNIA, ASSIGNOR OF ONE-HALF TO WILLIAM
B. ROBB, OF LOS ANGELES, CALIFORNIA.

STANDING-VALVE CONSTRUCTION FOR WELL-PUMPS.

1,049,719.

Specification of Letters Patent.

Patented Jan. 7, 1913.

Application filed May 25, 1912. Serial No. 699,653.

To all whom it may concern:

Be it known that I, ALVA HUNTER, a citizen of the United States, residing at Bakersfield, in the county of Kern and State of California, have invented a new and useful Standing-Valve Construction for Well-Pumps, of which the following is a specification.

This invention relates more specifically to that class of valves used in well pumps, and an object thereof is to provide a ball valve mechanism, which will not sand up to any appreciable extent during the operation of the same, and from which any small amount of sand that may accumulate, may be removed without withdrawing the valve mechanism entirely out of the well.

A further object of my invention is to provide a valve mechanism that may be utilized efficiently in oil wells in which there is a heavy gas pressure.

I accomplish these objects by means of the device described herein and illustrated in the drawings in which:

Figure 1 is a central vertical section of a pump barrel mounted in a well casing, illustrating my improved valve mechanism. Fig. 2 is an enlarged detail elevation of the valve mechanism. Fig. 3 is a transverse section taken on line 3—3 of Fig. 1. Fig. 4 is an enlarged transverse section taken on the line 4—4 of Fig. 1. Fig. 5 is a detail perspective view of a nut for limiting the upper movement of the valve stopper.

Referring more particularly to the drawing 5 designates an oil well casing of usual form which extends from the top of the ground to the bottom of the well, 6 a pump barrel in which is reciprocatingly mounted a hollow suction plunger 7. The lower end of the pump barrel is exteriorly threaded and engages an annular interiorly threaded recess 8 formed in the upper end of a casing 9 in which the valve mechanisms are mounted. The pump barrel 6 and casing 9 are stationary, being suspended from the top of the well in any well known manner.

Suction plunger 7 is provided in the upper end thereof with a valve 10 and a cage 11 therefor, the cage being in threaded engagement therewith. By inserting a washer into the end of the suction plunger, the annular edge 13 will serve as a stop for the wings of a spider 14 rigidly mounted on the upper end of a connecting rod 15, as clearly

indicated in Fig. 1 of the drawing. Mounted in the centrally disposed bore or recess 16 of the casing 9 is a standing valve mechanism 17, which preferably consists of a hollow cylindrical member 18, the lower end being sub-conical as at 19. This end seats in the sub-conical end of the central bore 16, as clearly shown in Fig. 1 of the drawing.

The outside diameter of bore 18 is of less diameter than the upper end of the conical bore 19 and is exteriorly threaded as at 20 for the reception of a sleeve 21 exteriorly threaded on its lower end. The upper end of this sleeve presents an annular shoulder 22 that engages an annular rib 24 formed on a hollow valve seat 25. By seating valve seat 25 on the upper end of member 18 which is in screw threaded engagement with said member, it will be observed that the annular shoulder 23 will be forced into positive engagement with the rib 24 of seat 25 and hold the same in rigid engagement with the standing valve 16.

The lower end of connecting rod 15 is screw threaded from its lower end upwardly, and in screw threaded engagement therewith is a ball valve 26 which is adapted to seat on the valve seat 25 during the operation of the pumping mechanism. The connecting rod 15 extends below the standing valve mechanism 17 and on the lower end thereof is a limiting nut 27 which is adapted to limit the upward movement of the connecting rod 15 when oil is passing through the standing valve 17, during the operation of the pumping mechanism. By adjusting the nut 27 upwardly or downwardly on rod 15 it will be apparent that the movement of the rod may be automatically adjusted.

The lower end of casing 9 is provided with a recess 28 preferably semi-spherical in configuration, the upper end of said recess connecting with the centrally disposed recess 16. The lower end of said casing 9 is provided with two vertically extending bores 29 and 30 which extend upwardly from the base of casing 9 terminating in recess 28. In these bores 29 and 30, are disposed valve mechanisms, preferably consisting of hollow cylindrical members 31, 32 which are in screw threaded engagement with the bores 29 and 30. The lower end of members 31 and 32 are provided with bear-

ings 33 mounted in the center thereof and connected by spider arms 34 with the inner surface of members 31 and 32, the arms permitting a free and unrestricted flow of oil from the well upwardly into the valve mechanisms.

Interposed between the members 31 and 32 and the upper ends of bores 29 and 30 which terminate in annular shoulders 35, are valve seats 36 which are similar in configuration to the valve seat 25 which is attached to the standing valve heretofore described. Mounted in bearings 33 are vertically disposed valve stems 37 to the upper ends of which are secured valve stoppers 38, the balls seating on the seats 36 as clearly shown in Fig. 1 of the drawing. The lower ends of the valve stems are preferably threaded, and each are provided with adjusting nuts 39 and lock nuts 40, tension springs 41 being interposed between the nuts and the bearings 33. By means of nuts 39 and springs 41 I am enabled to adjust the tension on ball valves 38 so as to control the pressure of gas in the well.

In numerous oil wells, the presence of gas is often noted and sometimes the pressure of the gas is so great as to cause the unseating and disarrangement of the standing valve mechanisms thereby causing said mechanisms to simply churn the oil instead of forcing it upwardly and out of the well. By interposing spring valve mechanisms heretofore described in the lower end of casing 9, this pressure may be readily and easily controlled without preventing the upward flow of the oil therethrough, this contributing greatly to the efficiency of the pumping mechanisms mounted in wells having an undue pressure of gas.

By providing a ball valve construction as illustrated at 26 without the usual cage mechanism therefor, and having it in screw threaded engagement with the connecting rod 15, all danger of sand becoming unduly lodged around the ball mechanism so as to render the mechanism inoperative is avoided. Also by employing a mechanism as above described, when it is found desirable, for any reason, to clean and free the same from a small amount of sand or other foreign matter which may happen to accumulate around the same, I simply lift the valve mechanism 17 out of its seat, raising and lowering the same until any sand or other matter is washed away therefrom, thus sav-

ing the expense and time of pulling the sucker rods of the well together with the plungers and standing valves connected thereto, entirely out of the well to free the same of sand.

The operation of my device will be apparent from the following: When the suction plunger 7 is reciprocated in the pump barrel 6 on its upper stroke, it will draw the oil from the bottom of the well upwardly through the valve mechanisms located in the end of casing 9 upwardly through the valve mechanisms 17 and force the ball away from its seat, the nut 27 limiting the upward movement of the ball. The oil will then flow upwardly into the barrel of the suction plunger and from there through ball valve 10 to the point of discharge.

What I claim is:

1. A well pump mechanism, comprising a pump barrel having a suction plunger reciprocatingly mounted therein, a valve casing member secured to the lower end of said pump barrel, an adjustable ball valve mounted in the upper end of said casing, said casing being provided at the lower end thereof with a recess therein, and an automatic spring controlled check valve mounted in and closing the lower end of said casing opening into the recess in the casing.

2. In a mechanism of the class described, a pump barrel having a reciprocating suction plunger mounted therein, a casing secured to the lower end of the pump valve, said casing being provided in the upper end thereof with a longitudinally disposed bore and having a recess therein communicating with said bore, a ball valve mechanism mounted in said central bore, a threaded rod to engage said ball, a flat nut on said rod to adjust and to limit the upward movement of the ball stopper from its valve seat, said nut engaging said bore but not interfering with the passage of fluids, and a plurality of automatic spring controlled valves mounted in the lower end of said casing, said valves communicating with the recess formed in the lower end of said casing.

In witness that I claim the foregoing I have hereunto subscribed my name this 4th day of May, 1912.

ALVA HUNTER.

Witnesses:

EDW. A. KELLY,
H. B. DOLCH.