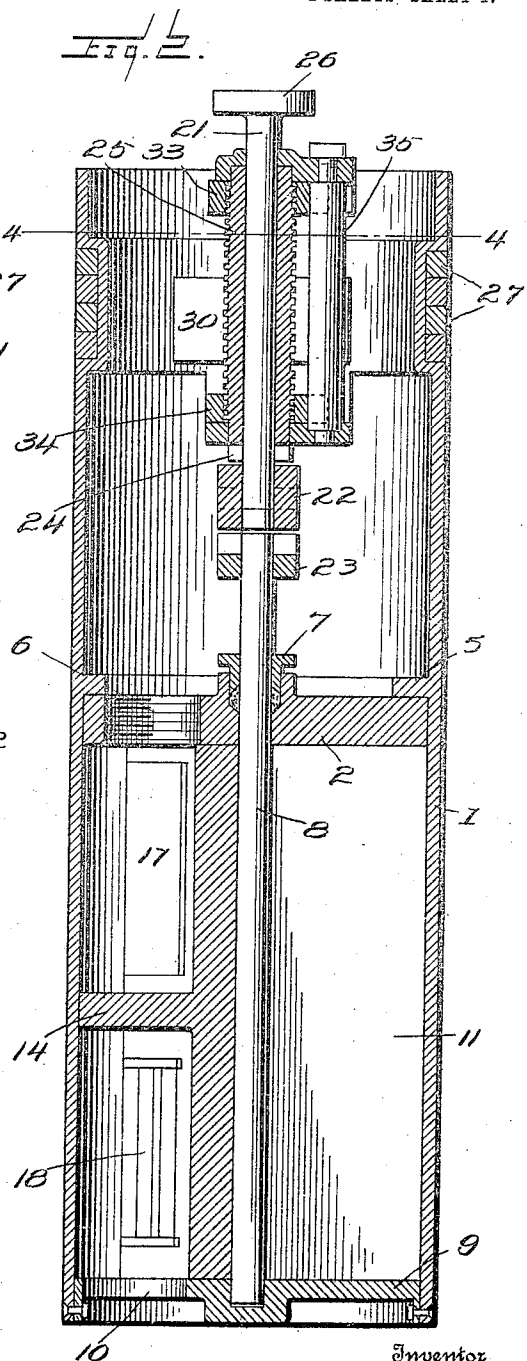
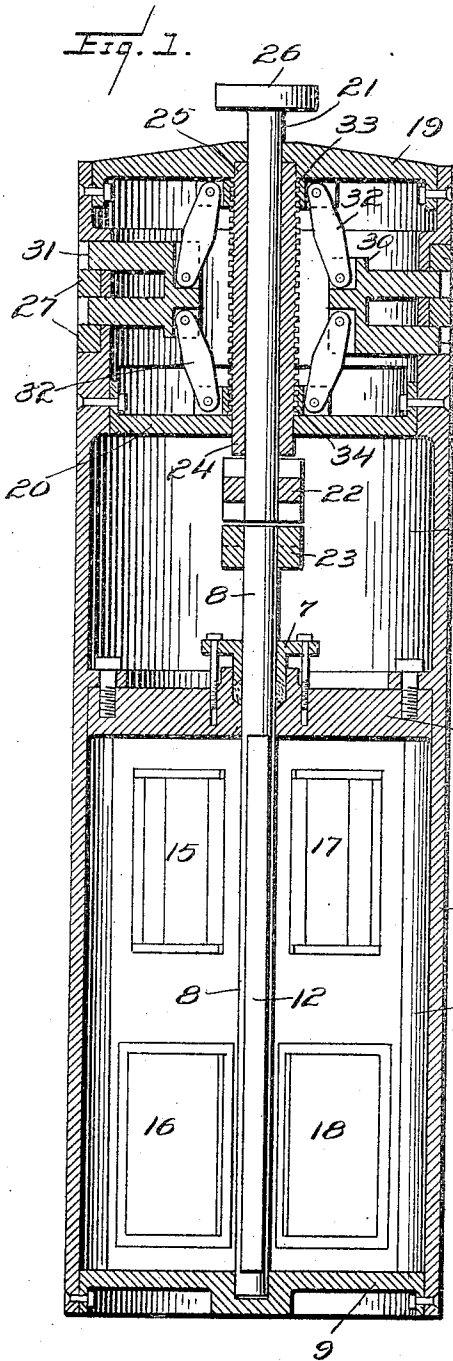


R. G. HOLEKAMP.
DOUBLE ACTING PUMP.
APPLICATION FILED MAR. 19, 1909.

943,018.

Patented Dec. 14, 1909.
2 SHEETS—SHEET 1.



Inventor
Richard G. Holekamp,

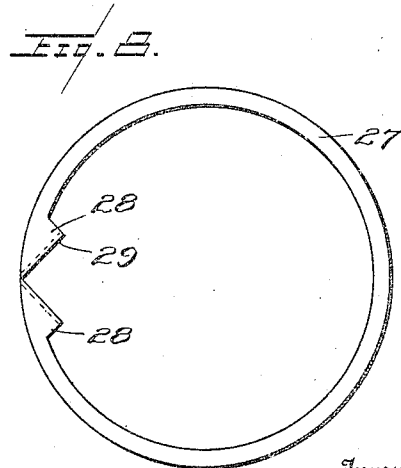
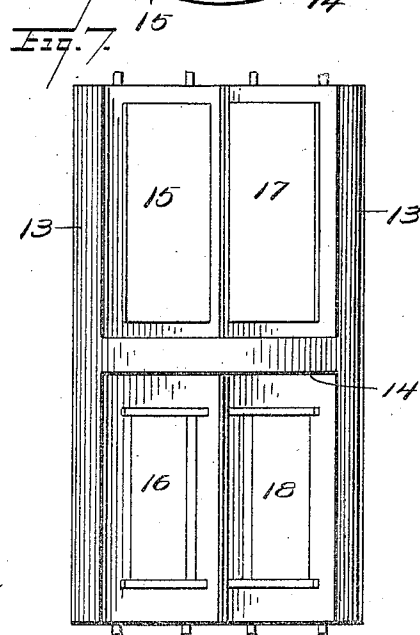
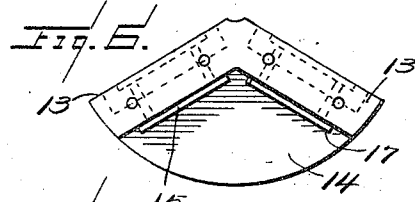
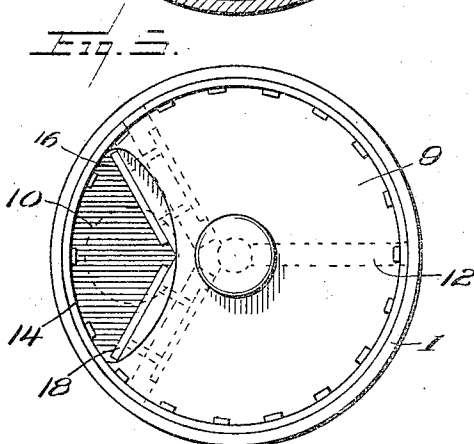
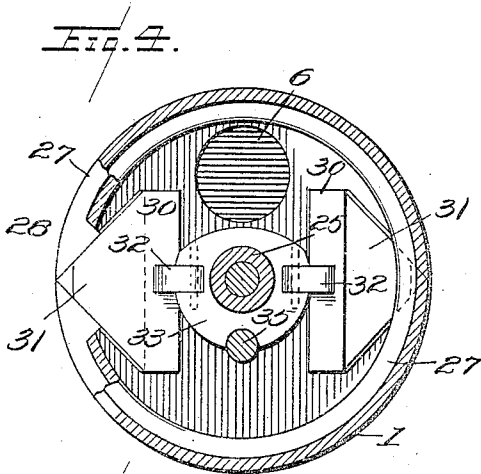
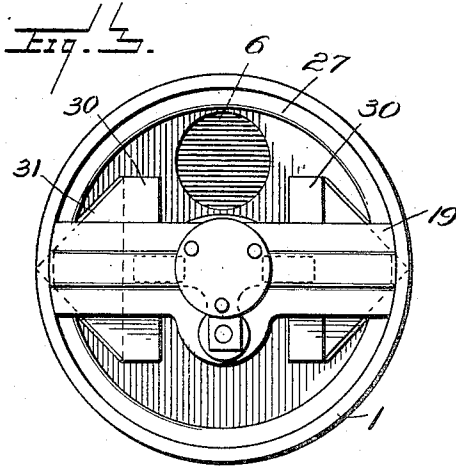
Witnesses
E. R. Ruppert.
U. B. Hillyard.

By Victor J. Evans
Attorney

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UNITED STATES PATENT OFFICE.

RICHARD G. HOLEKAMP, OF COMFORT, TEXAS.

DOUBLE-ACTING PUMP.

943,018.

Specification of Letters Patent. Patented Dec. 14, 1909.

Application filed March 19, 1909. Serial No. 484,508.

To all whom it may concern:

Be it known that I, RICHARD G. HOLEKAMP, a citizen of the United States, residing at Comfort, in the county of Kendall and State of Texas, have invented new and useful Improvements in Double-Acting Pumps, of which the following is a specification.

This invention relates to double acting pumps and has for its object to supply a mechanism for raising liquid such as oil or water in a comparatively steady stream and with the expenditure of a minimum amount of force.

With these and other objects in view, the invention consists in the novel features, details of construction and combinations of parts which hereinafter will be more particularly set forth, illustrated and finally claimed.

Referring to the drawings forming a part of the specification:—Figure 1 is a vertical central section on a pump embodying the invention. Fig. 2 is a sectional view similar to Fig. 1, taken at a right angle thereto. Fig. 3 is a top plan view of the pump. Fig. 4 is a horizontal section on the line 4—4 of Fig. 2, a portion of the casing being broken away to show the end portions of a packing ring. Fig. 5 is a view of the pump as seen from the lower end. Fig. 6 is a top view of the valve chest. Fig. 7 is a front view of the valve chest. Fig. 8 is a plan view of a packing ring.

Corresponding and like parts indicated in the following description and in all of the views of the drawings are designated by like reference characters.

The casing 1 is preferably of cylindrical form and may be of any length and diameter and is sub-divided by means of a partition 2 into upper and lower chambers. The upper chamber 3 receives the packing and clamping mechanism. The lower chamber 4 contains the pumping mechanism comprising the valves and piston. The partition 2 may be separate from the casing and secured thereto in any manner or it may form a part thereof. In the preferred construction, the partition 2 is separate from the casing and is secured to an inner flange or shoulder 5 formed with said casing. An opening 6 is formed in the partition 2 and constitutes an outlet and is internally threaded to receive a discharge pipe, (not shown) when such pipe is employed to convey the

liquid to the surface or other point of discharge. A stuffing box 7 of any approved construction is provided centrally of the partition 2 to insure the formation of a tight joint between said partition and the vertical shaft 8. An end piece 9 is fitted in the lower end of the casing 1 and has an opening 10 for the ingress of liquid. The lower end of the shaft 8 is stepped in an opening formed in a reinforced central portion of the end piece 9.

The lower chamber is sub-divided to provide a pump compartment 11 and a valve chest. A piston 12 is arranged to operate in the pump compartment 11 and is fast at its inner vertical edge to the shaft 8. The piston 12 obtains a close fit against the upper end, the lower and the inner walls of the pump compartment and operates by an oscillatory movement, the actuating mechanism, (not shown), being of such a nature as to impart an alternating backward and forward rotary movement to the shaft 8.

The valve chest comprises oppositely inclined walls 13 and an intermediate partition 14. The walls 13 form radii of the pump compartment and their inner ends fit close against the vertical shaft 8 to insure the formation of a close joint. The partition 14 is of sector shape and its outer edge fits close against the inner wall of the part of the casing comprised between the walls 13 and in line with the partition 14. Each wall 13 is provided with two valves which are arranged to operate in a reverse direction, the four valves being designated by the numerals 15, 16, 17 and 18. The valves 15 and 17 open inward with reference to the valve chest whereas the valves 16 and 18 open outward into the pump compartment. When the piston 12 is traveling in one direction the valve 18 opens in one direction and permits liquid to be drawn into the pump compartment upon one side of the piston, the air upon the opposite side of the piston being forced outward through the valve 15. Upon movement of the piston 12 in the opposite direction, the liquid is drawn into the pump compartment through the valve 16 and the liquid previously drawn into the pump compartment is forced therefrom into the upper portion of the valve chest through the valve 17. As the piston continues to oscillate, liquid is drawn into the pump compartment upon one side of the piston and forced from said pump compart-

ment into the upper portion of the valve chest upon the opposite side of the piston, hence, there is a continuous suction and a continuous discharge, the valves 15 and 18 and the valves 17 and 16 operating in alternation.

Two supports 19 and 20 are secured in the upper portion of the casing 1 and are provided centrally with openings forming bearings for a vertical shaft 21. A coupling head 22 is provided at the lower end of the shaft 21 and is adapted to engage with a coupling member 23 at the upper end of the shaft 8 or with a coupling member 24 at the lower end of a hollow shaft 25 mounted in the parts 19 and 20. The hollow shaft 25 is externally threaded, the threads upon one end being the reverse of the threads upon the opposite end. The shaft 21 has a coupling member 26 at its upper end for the power transmission shaft, (not shown) to make connection. The shaft 21 is mounted within the hollow shaft 25 and when moved upward to bring the coupling members 22 and 24 into engagement, the shafts 21 and 25 rotate together. When the shaft 21 is pressed downward to bring the coupling members 22 and 23 into engagement, the shafts 21 and 8 move in unison. A series of rings 27 are mounted in a contracted portion near the upper end of the casing and constitute packing and clamping elements to secure the pump within the well casing at the desired point. In the event of the pump casing being reamed or otherwise made smooth upon its inner wall so as to cooperate with the rings 27 to insure a close joint it is not necessary to employ a discharge pipe for carrying the liquid to the surface.

Each packing and clamping ring is constructed substantially as shown most clearly in Fig. 8 and is split and provided at the ends adjacent the split with heads 28 which are inclined upon their inner sides and grooved as indicated at 29. In assembling the packing rings 27, they are arranged to break joint, that is, the split of one ring is arranged diametrically opposite the split of the adjacent ring. Hence, a close fit is obtained when the parts are partly fitted. Oppositely disposed spreaders 31 are provided for expanding the rings 27. Each spreader consists of a head 30 and wedge shaped members 31, the latter being positioned so as to come between the inclined sides of the tapered ends 28 of the packing rings. A series of links 32 connect the spreaders with nuts 33 and 34, mounted upon end portions of the threaded shaft 25. The links normally incline, their opposing ends being at a greater distance from the shaft 21 than their outer ends. As a result of this arrangement, rotation of the shaft 25 in one direction advances the nuts 33 and 34 and moves the spreaders 30 outward and

expands the rings 27. Rotation of the shaft 25 in the opposite direction separates the nuts 33 and 34 and results in drawing the spreaders inward and admitting of the rings 27 contracting. The rings 27 are of spring metal so as to automatically contract. To prevent turning of the nuts 33 and 34 a stay bar 35 is mounted at its ends in the supports 19 and 20 and engages portions of said nuts as indicated most clearly in Figs. 2 and 4.

While the pump herein described is peculiarly adapted for deep wells it may be used to advantage in locations where liquid is to be elevated and forced to a required point of discharge. When the pump is lowered into the well, it may be secured at the required point and a tight joint at the same time be obtained by turning the threaded shaft 25 to move the spreaders 30 outward and thereby expand the rings 27 which clamp the pump in the casing and at the same time provide a tight joint in the event of the pump casing being true. The shaft 25 is turned from the surface by moving the shaft upward to bring the coupling members 22 and 24 into engagement. When the pump is in operation, the shaft 21 is lowered to bring the coupling members 22 and 23 into engagement. The pump may be easily removed from the well at any time by moving the shaft 21 upward to bring it into clutched engagement with the shaft 25 to turn the latter so as to withdraw the spreaders and admit of the rings 27 contracting and releasing the pump after which the pump may be lifted from the well as will be understood.

I claim:—

1. In a pump of the character described, the combination of a casing, a pumping mechanism located within a portion of the casing, a packing mechanism arranged in a different portion of the casing, and a shaft common to both the pumping and the packing mechanisms and adapted to be moved to operate either as may be required.

2. In a pump of the character described, the combination of a casing, split packing rings fitted upon the casing and arranged with the split portion of one ring opposite the split portion of the adjacent ring, spreaders, a shaft having end portions oppositely threaded, nuts mounted upon the threaded ends of the shaft, and links connecting the nuts with the spreaders to effect radial movement of the latter both outwardly and inwardly.

3. In a pump of the character described, the combination of a casing, split rings mounted upon the casing and arranged with the split portion of one ring opposite the split portion of the adjacent ring, spreaders comprising wedge shaped members to come between the split terminals or rings, a shaft

having end portions oppositely threaded, nuts mounted upon the threaded portions of the shafts, and links connecting said nuts with the spreaders.

5 4. In a pump of the character described, the combination of a casing, expansible rings mounted upon the casing, spreaders coöper-
10 ating with said rings, a shaft having oppositely threaded portions, nuts mounted upon the threaded portions of the shaft, links connecting the nuts with the spreaders, and
a stay bar coöperating with the nuts to prevent their relative turning upon the shaft.

15 5. In a pump of the character described, the combination of a casing, a pumping mechanism located within a portion of the casing and including a shaft, a packing
20 mechanism located within a part of the casing and including expansible rings, an operating mechanism for said rings including a threaded shaft, and an operating shaft mounted both to move longitudinally and to rotate and provided with a coupling to make engagement either with the shaft of

the pumping mechanism or with the afore- 25
said shaft of the operating mechanism to actuate either as may be required.

6. A pump comprising a casing sub-di-
vided to provide upper and lower chambers, a pumping mechanism located in the lower 30
chamber and including a shaft, a packing mechanism arranged in the upper chamber and including a threaded shaft in line with the shaft of the pumping mechanism, and
an operating shaft mounted within said 35
threaded shaft and provided at its lower end with a coupling head to make clutched engagement with either the shaft of the
pumping mechanism or the aforesaid
threaded shaft to actuate either the pump- 40
ing mechanism or the packing mechanism as may be required.

In testimony whereof I affix my signature in presence of two witnesses.

RICHARD G. HOLEKAMP.

Witnesses:

E. HABECKER,
ALBERT FALBIN.