(No Model.)

C. J. McKENZIE & D. M. MIKESELL.

PUMP.

No. 455,636. Patented July 7, 1891.

Fig. 1.

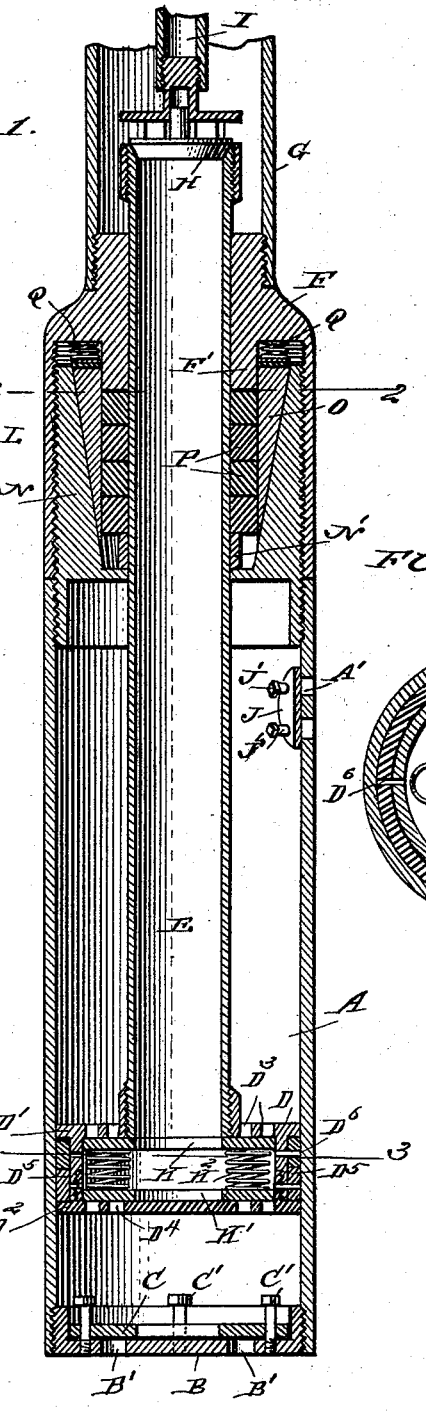


Fig. 2.

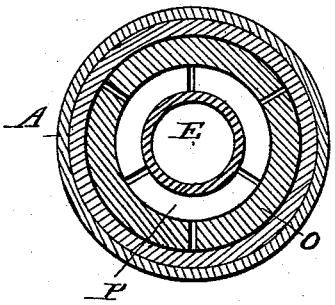
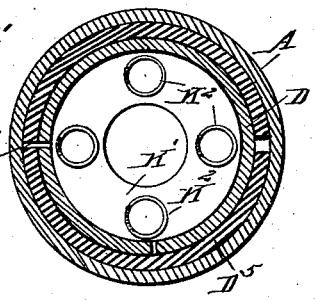


Fig. 3.



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PUMP.

SPECIFICATION forming part of Letters Patent No. 455,636, dated July 7, 1891.

Application filed September 4, 1890. Serial No. 363,938. (No model.)

To all whom it may concern:

Be it known that we, CHARLES J. McKENZIE and DAVID M. MIKESELL, of Wauseon, in the county of Fulton and State of Ohio, have invented a new and Improved Pump, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved pump which is simple and durable in construction, very effective in operation, and serves as a double-acting force and lift pump.

The invention consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claim.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement. Fig. 2 is a sectional plan view of the same on the line 2 2 of Fig. 1, and Fig. 3 is a similar view of the same on the line 3 3 of Fig. 1.

The improved pump is provided with a cylindrical barrel A, having a bottom B provided with a number of openings B′, arranged in a circle and adapted to be closed on the inside by a ring-valve C, fitted to slide vertically on bolts C′, secured on the bottom B.

Within the barrel A is fitted to slide a recessed plunger D, secured on a hollow stem E in communication with the recess of the plunger and adapted to pass through a head F, held on the upper end of the barrel A. The head F screws in the lower end of a tube G, extending to the outside of the well in which the pump is located and serving as an exit-pipe for the water. On the extreme upper end of the hollow vertical stem E is arranged a check-valve H, and the said upper end of the stem is rigidly connected with a rod or pipe I, extending through the tube G and connected with suitable mechanism for imparting an up-and-down motion to the said rod, so as to work the plunger D in the barrel A.

Above the plunger D is arranged on the inside of the wall of the barrel A a valve J, operating over openings A′, formed in the wall of the barrel, as is plainly shown in Fig. 1. The valve J is preferably made in the form of a disk shaped at the inner face to the inside of the cylindrical barrel, and the said valve is fitted to slide on bolts J′, screwing in the wall of the barrel A on the inside thereof.

The plunger D is provided with a top D′ and bottom D^2, fastened together by flanges or other suitable means and provided with openings D^3 and D^4, respectively, adapted to be opened and closed by ring-valves K and K′, arranged between the top and bottom D′ and D^2 in the recess of the plunger. One or more springs K^2 are interposed between the ring-valves K and K′, so as to press the latter against the top and bottom in order to close the openings D^3 and D^4, respectively. Between the top and bottom D′ and D^2, respectively, are arranged split rings D^5, held in place at their middle by pins D^6, fitting into the flanges of the top and bottom D′ and D^2.

In the head F is arranged a packing L, provided with a shell N, the inner surface of which is conical, as is plainly shown in Fig. 1, and is adapted to be engaged by a series of segmental wedges O, pressing with their inner straight sides of sectional packing-rings P, held against the exterior of the hollow stem E. One or more coil-springs Q are arranged on top of the wedges O, the upper ends of the said springs pressing against the under side of the head F, as is plainly shown in Fig. 1. The lowermost packing-ring P rests on a fixed ring N′, arranged or formed in the bottom of the shell N. The uppermost packing-ring P is engaged by an annular projection F′, formed on the head F, and also engaging the inside of the walls O. The shell N is provided with an exterior thread, part of which screws in the barrel A and part in the head F, so that the latter is united by the said shell with the casing A, and at the same time the head F forms a gland for the packing L.

The operation is as follows: The barrel A is submerged in the water in the well, and when the plunger D is moved upward the ring-valve C opens the openings B′ to permit the water to fill the lower part of the barrel. The water above the plunger D on the barrel A presses through the openings D^3 to open

the ring-valve K and to pass into the recessed plunger, and from the latter through the hollow valve-stem E and past the check-valve H to the exit-tube G, the valves K′ and J′ remaining closed during the upward movement of the plunger. On the downward stroke of the plunger the ring-valve C closes and the water in the lower part of the barrel presses through the openings D^4 to open the ring-valve K′ and to pass into the recess of the plunger, and from the latter through the hollow stem E, past the check-valve H to the tube G. At the same time the valve J opens inward, so that water from the well rushes through the openings A′ into the upper part of the barrel and fills the same. The valves K and C remain closed during the downward stroke of the plunger. Thus it will be seen that a continuous stream of water is pumped on the up and down stroke of the plunger, and that the water can be lifted or forced to any desired height. It will further be seen that the cylindrical barrel A permits of placing the same into a fixed pipe such as are usually found in drill-wells, as the said barrel has no projections whatever on the outside. It will also be seen that the pump is very simple and durable in construction and not liable to get out of order.

Having thus fully described our invention, we claim as new and desire to secure by Letters Patent—

In a pump, the combination, with the casing A, of the head F, having its lower portion interiorly screw-threaded and provided with the annular projection F′, the shell N, exteriorly threaded and having an inner conical face, the packing-rings P, the wedges O, and the springs Q, substantially as and for the purpose set forth.

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