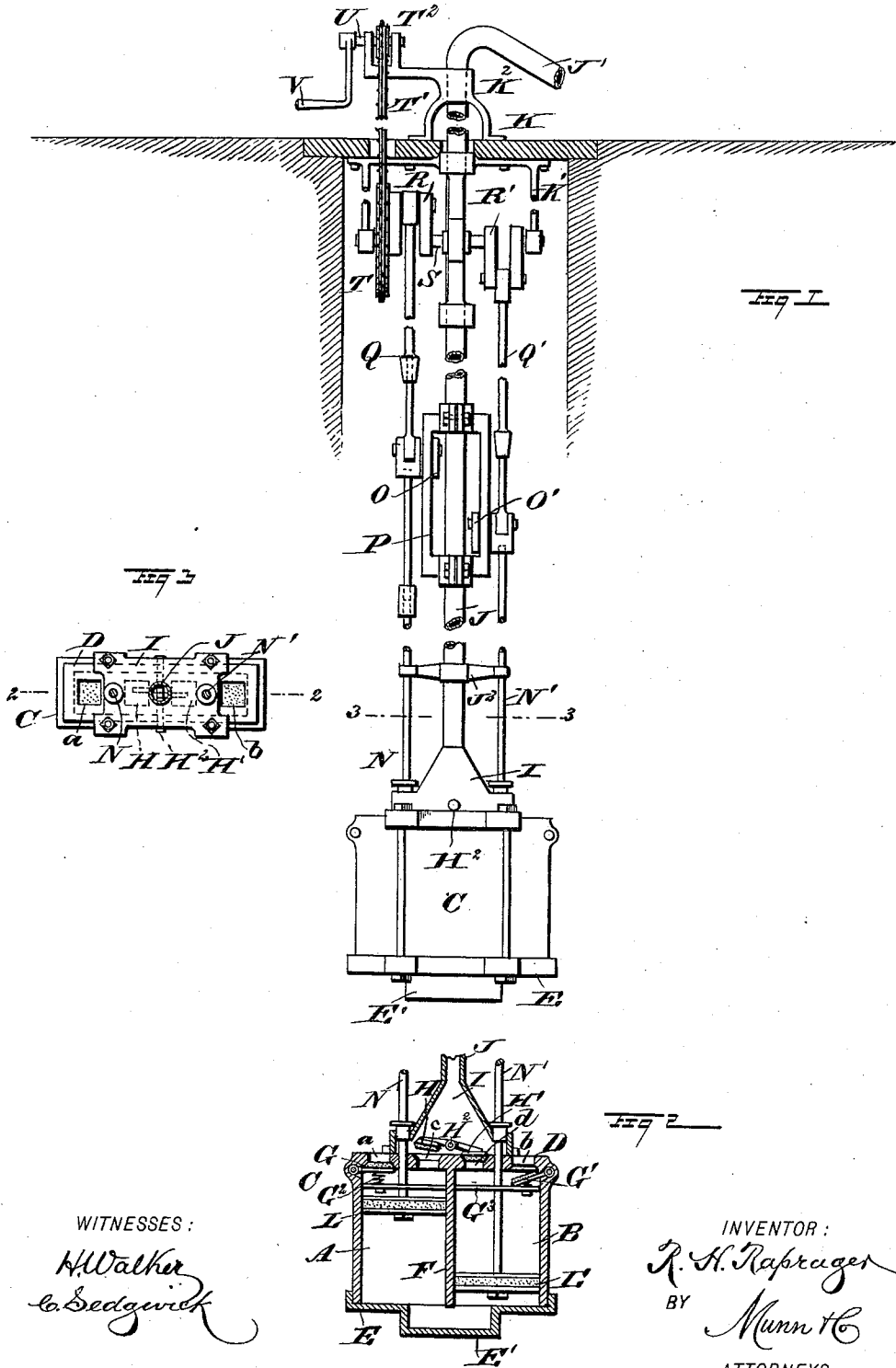


(No Model.)

R. H. RAPRAGER.
PUMP.

No. 478,464.

Patented July 5, 1892.



WITNESSES:

H. Walker
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ROBERT HENRY RAPRAGER, OF LAKOTA, NORTH DAKOTA.

PUMP.

SPECIFICATION forming part of Letters Patent No. 478,464, dated July 5, 1892.

Application filed January 15, 1892. Serial No. 418,191. (No model.)

To all whom it may concern:

Be it known that I, ROBERT HENRY RAPRAGER, of Lakota, in the county of Nelson and State of North Dakota, 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, easy, and double-acting in operation, and not liable to get out of order, and adapted for use in a cold climate, as all the pumping parts being below the surface of the water are thereby protected from freezing.

The invention consists of two plunger-barrels connected with each other at the bottom and provided at the top with inlet-valves.

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

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 side elevation of the improvement as applied and with parts in section. Fig. 2 is a sectional side elevation of the plunger-barrels on the line 2 2 in Fig. 3, and Fig. 3 is a sectional plan view of the improvement on the line 3 3 in Fig. 1.

The improved pump is provided with two plunger-barrels A and B, formed in a single casing C, provided in its solid top D with inlet-ports *a* and *b* and outlet-ports *c* and *d*. The lower ends of the plunger-barrels A and B are in communication with each other, and for this purpose the bottom E of the casing is formed in its middle with a recess E', extending below the division-wall F, arranged between the two barrels A and B.

The inlet-ports *a* and *b* are adapted to be closed from the inside of the plunger-barrels by valves G and G', respectively, held normally against their seats in the said top D by springs G², resting on a cross-bar G³, held within the casing C. The outlet-ports *c* and *d* are normally closed by valves H and H', adapted to be seated on the outer surface of the top D, both being pivoted on the pin H², extending transversely and held in the air-

chamber I, secured to the top of the casing C and provided with a pipe J, extending upward to the top of the well, passing through a suitable platform K on the top of the well, as plainly shown in Fig. 1. The outer end of the pipe J is formed with the usual bend J', serving as an outlet.

In the barrels A and B are fitted to slide up and down the plungers or pistons L and L', held on piston-rods N and N', respectively, extending through suitable bearings in the top D and casing I. The plunger-rods extend upwardly and pass through suitable guides J², attached to the outlet-pipe J, as shown in Fig. 1. The upper ends of the plunger-rods N and N' are connected with the cross-heads O and O', respectively fitted to slide on the slide P, clamped or otherwise secured to the outlet-pipe J. The cross-heads O and O' are pivotally connected with pitmen Q and Q', respectively connected with the crank-arms R and R', respectively held on a shaft S, mounted to turn in suitable bearings formed in brackets K', attached to the under side of the platform K.

On the shaft S is secured a sprocket-wheel T, over which passes a sprocket-chain T', extending upward through the platform K and passing over a sprocket-wheel T², held on a shaft U, mounted to turn in suitable bearings formed in a bracket K², attached to the top of the platform K. On the shaft U is secured a crank-arm V for conveniently turning the said shaft U, so that the sprocket-wheel T², sprocket-chain T', and sprocket-wheel T impart a rotary motion to the shaft S.

The operation is as follows: The barrel-case C is located in the bottom of the well, so as to be completely submerged in the water. When the several parts are in the position shown in Fig. 1 and the operator turns the crank-arm V, the shaft S is rotated as above described, and a sliding motion is given to the cross-heads O and O' by the crank-arms R R' and pitmen Q Q'. The cross-heads O O' impart motion to the rods N and N', so that the plungers L and L' move up and down in their barrels A and B. As shown in Fig. 2, the plunger L is on the upstroke and the plunger L' is on the downstroke, and the water from the well entering through the port *b* past the

open valve G' into the barrel B, to accumulate therein, the outer valve H' closing the port *d*. The water on the top of the plunger L in the barrel A is forced upward and outward through the port *c*, thus opening the valve H and closing the valve G. The water passes from the barrel A into the casing I, and from the latter into the outlet-pipe J. On the upstroke of the plunger L' the water previously accumulated in the barrel B is discharged through the port *d*, the valve H' being opened by the force of the water. The plunger L at the same time will make its downstroke, so that the valve H will naturally close or fall onto its seat, while the valve G is opened and water enters the barrel A through the port *a*. It is understood that one plunger moves upward while the other moves downward, so that a continuous stream of water is forced into the casing I to enter the discharge-pipe J to pass finally through the spout J' at the top of the well. It is understood that in order to move the plungers in the direction indicated the crank-arms R and R' are set diagonally opposite each other, as plainly shown in Fig. 1. By connecting the lower ends of the barrels A and B with each other no undue pressure or vacuum is created on the alternate up-and-down movement of the plungers. If desired, the barrels A and B below their plungers L and L' may be filled with a suitable fluid, preferably oil, it being understood that the movement of the fluid will follow the plungers, so that no undue friction, vacuum, or pressure is created on either of the plungers. I desire it to be understood that I do not limit myself to the arrangement and location of the valves G and G' on the inside of the pump-barrels A and B and balanced by the springs G² and cross-bar G³, as the valves may be located on the outside of the pump-barrels and balanced by any equivalent of the springs and cross-bar and be as well governed by the strokes of the pistons as when located as shown in the drawings.

Having thus fully described my invention,

I claim as new and desire to secure by Letters Patent—

1. In a pump, the combination, with two plunger-barrels connected with each other at their bottoms, of inlet-valves and outlet-valves arranged in the upper ends of the said barrels, an outlet-pipe formed with a casing, into which discharge the said outlet-valves, plungers fitted to slide in opposite directions in the said barrels, plunger-rods carrying the said plungers, cross-heads rigidly connected with the said plunger-rods, a slide secured on the said outlet-pipe and on which travel the said cross-heads, pitmen connected with the said cross-heads, crank-arms arranged diametrically opposite each other and connected with the said pitmen, and a shaft mounted to turn and carrying the said crank-arms, substantially as shown and described.

2. In a pump, the combination, with two plunger-barrels connected with each other at their bottoms, of inlet-valves and outlet-valves arranged in the upper ends of the said barrels, an outlet-pipe formed with a casing, into which discharge the said outlet-valves, plungers fitted to slide in opposite directions in the said barrels, plunger-rods carrying the said plungers, cross-heads rigidly connected with the said plunger-rods, a slide secured on the said outlet-pipe and on which travel the said cross-heads, pitmen connected with the said cross-heads, crank-arms arranged diametrically opposite each other and connected with the said pitmen, and a shaft mounted to turn and carrying the said crank-arms, a sprocket-wheel secured on the said shaft, a sprocket-chain passing over the said sprocket-wheel, a second sprocket-wheel over which passes the said chain, and a second shaft provided with a crank-arm and carrying the said second sprocket-wheel, substantially as shown and described.

ROBERT HENRY RAPRAGER.

Witnesses:

WM. H. STANDISH,
W. A. PERKINS.