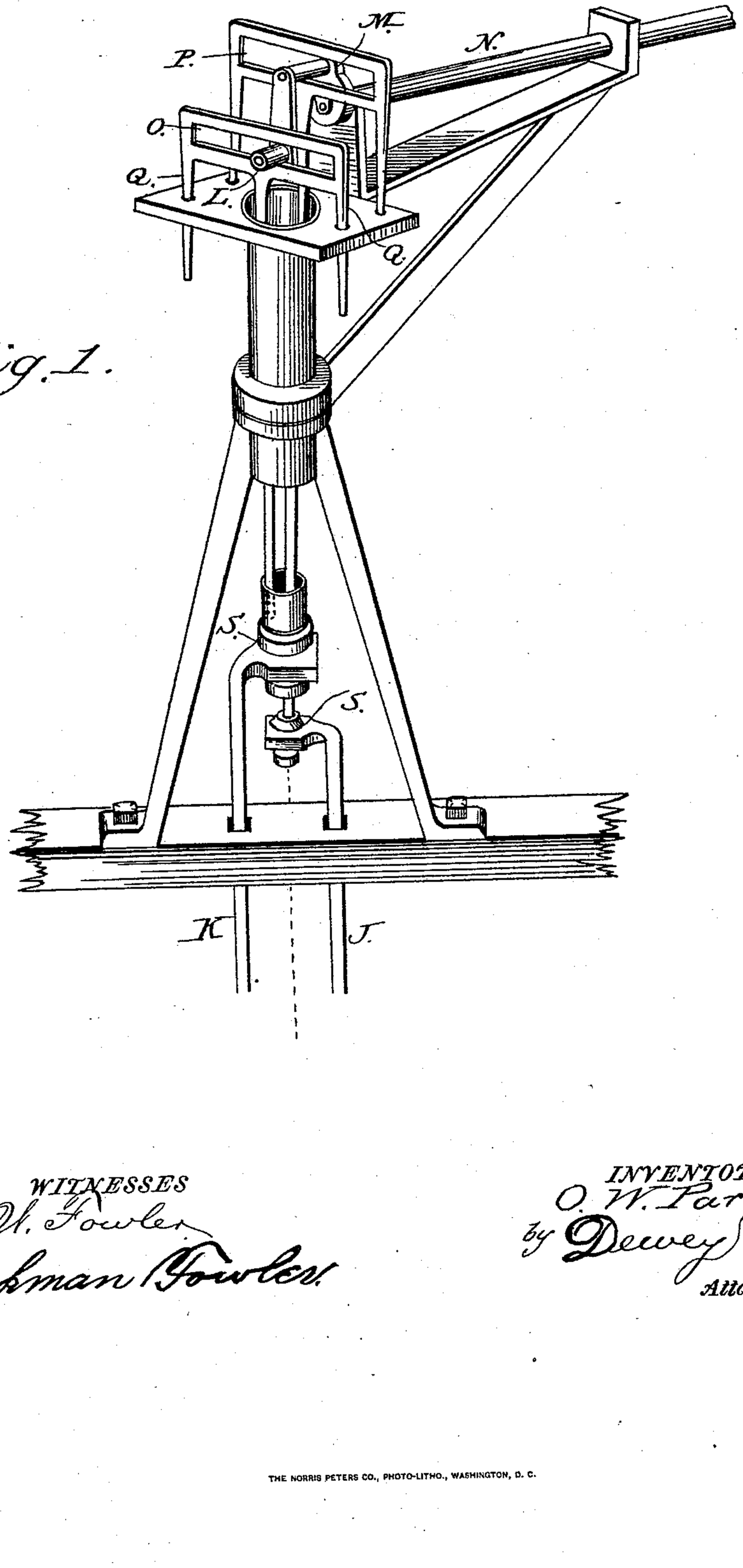
(No Model.) 2 Sheets—Sheet 1.

# O. W. PARKER.

## DOUBLE ACTING LIFT PUMP.

No. 455,515. Patented July 7, 1891.

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

# O. W. PARKER.

## DOUBLE ACTING LIFT PUMP.

No. 455,515. Patented July 7, 1891.

FIG 2

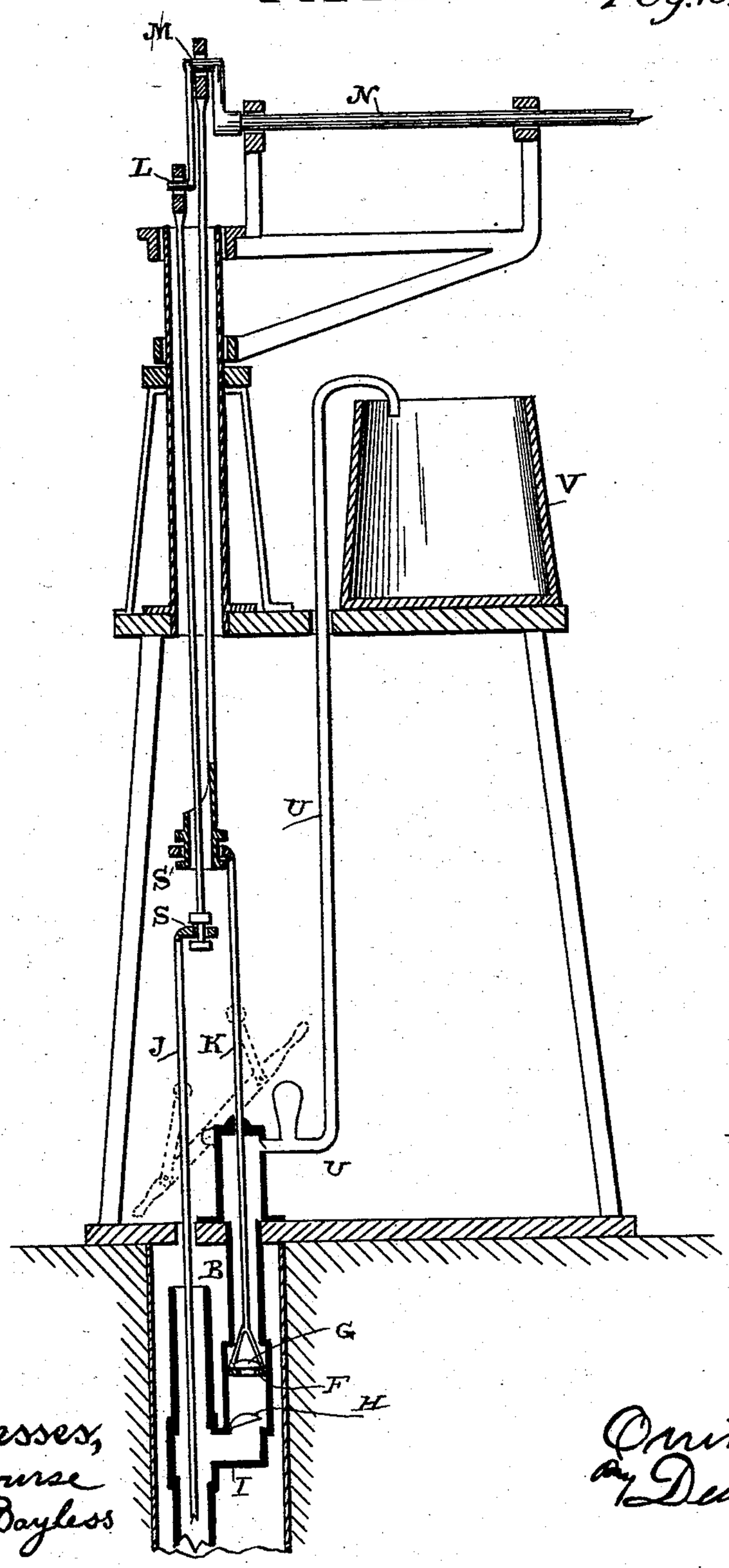
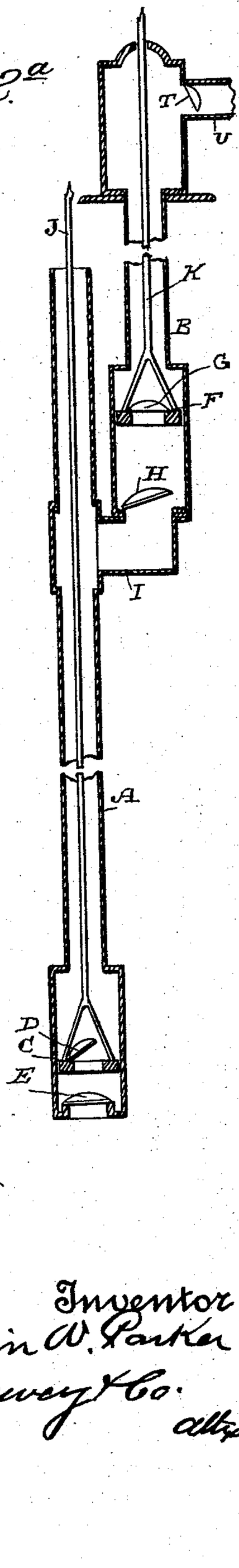



Fig. 2a

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# UNITED STATES PATENT OFFICE.

ORRIN W. PARKER, OF OAKLAND, CALIFORNIA.

## DOUBLE-ACTING LIFT-PUMP.

SPECIFICATION forming part of Letters Patent No. 455,515, dated July 7, 1891.

Application filed August 12, 1890. Serial No. 361,824. (No model.)

*To all whom it may concern:*

Be it known that I, ORRIN W. PARKER, a citizen of the United States, residing at Oakland, Alameda county, State of California, have invented an Improvement in Double-Acting Lift-Pumps; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to certain improvements in pumps of that class known as "lifting-pumps." It is especially applicable for use upon windmills, but may also be used in other connections.

It consists of two independently-operating pumps, the barrels of one of which dip into the well or source of supply and are provided with a piston, piston-rod, and upwardly-opening valves, and the second pump is adapted to receive its supply from the upper end of the first one. A connection is made to the open air between the two pumps, so that each one works independently of the other. The piston-rods of the two barrels are connected with the reciprocating mechanism, so that the two are reciprocated in opposite directions, and the two barrels while working together are essentially independent of each other. From the second barrel the water may be delivered to any desired height through a delivery-pipe having the usual valve and air-chamber, like a force-pump.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a perspective view of the upper portion of the mechanism, showing the cranks by which the pistons are reciprocated and the guides of the piston-rods. Figs. 2 and 2ª are broken vertical sections showing the relative arrangements of the two pumps.

I have illustrated my invention by two independent pump-barrels with a connecting-passage; but the same action would result by using a single continuous barrel with two sets of valves, two pistons, and two piston-rods, the rod of the lower piston passing through that of the upper one and a branch pipe opening outward to the air from the pump-barrel just below the fixed valve of the upper pump.

A and B are two pump barrels or cylinders. The barrel A extends downward to the well or source of supply and has reciprocating within it near the lower end a piston C, provided with an upwardly-opening valve D.

E is an upwardly-opening valve fixed in the bottom of the pump-chamber, and through this valve water is admitted into the pump-chamber at each upward stroke of the piston C, and this water passes through the valve D whenever the piston is moved downward. Each upstroke of the piston lifts the water through the barrel A.

At the lower end of the barrel B is the second pump-chamber, containing a piston F with an upwardly-opening valve G, and H is a stationary upwardly-opening valve of this pump-chamber. The lower part of this pump-chamber is connected with the barrel A by a pipe or passage I at a point considerably below the top of the barrel A. This allows the water which is lifted by the upward stroke of the piston C to pass upwardly in the barrel A, so as to stand temporarily at some height above the passage I, and it will be seen that by this construction the water in the barrel A is only lifted to that point by the action of its piston and that none of the force exerted upon the piston C is utilized to force the water up through the barrel B. The water which has been lifted in the barrel A to a point above the connecting-pipe I will be drawn by the piston F into its pump-chamber through the valve H, and will be lifted by this piston independently of any action of the piston C. If a single continuous pump-barrel is employed with two pistons and sets of valves, the extension is in the form of a short pipe opening outward and upward from the main barrel just below the upper fixed valve. By this construction each of the pistons C and F has only the duty of lifting the water within its own pump-chambers, and each one lifts the water which is delivered to it independently of the other, thereby relieving each piston of any extra power which would be exerted by it if the water must be lifted through both cylinders by the upward stroke of either of the pistons. These pistons are caused to reciprocate in opposite directions, being either connected through the piston-rods J and K with an oscillating lever, as shown in dotted lines in Fig. 2, in case the

pump is to be used as a hand-pump; or they may be connected, as shown in the full lines, with the two cranks L and M, fixed to the crank-shaft N.

In order to adapt this apparatus for use upon a windmill where the wheel and crank-shaft and supporting-table are allowed to rotate about a vertical axis, the piston-rods J and K are connected with their cranks in such a manner as to allow the latter to rotate with the table around the vertical center without interfering with the action of the two piston-rods.

In Fig. 1 I have shown the upper ends of the piston-rods as provided with the transversely-slotted heads O and P, and the crank-pins L and M enter the slots in these heads, respectively, and as they rotate they traverse from one end to the other of the slots, the slots being long enough to allow the full throw of the cranks. Each of the heads O and P have guides, as shown at Q, and these guides pass through vertical holes in the table R, which supports the crank-shaft, so that the reciprocation of the pump-rods in a vertical line is insured. These pump-rods are connected with the cranks by swivel-heads, as shown as S, so that while the table and the crank-shaft are allowed to turn to suit the direction of the wind the swivels permit the connecting-rods to turn with the crank-shafts without interfering with the action of the pump-rods. These swivels are situated in the vertical line of rotation, which is central between the two cranks, and as the connecting-rods are of considerable length the reciprocating motion does not essentially interfere with the action of the swivel-joints.

The first pump-barrel A may be made of any desired length to raise the water from the well to a height of one-half, more or less, of the whole distance to which it is to be raised, and the second barrel B may be of such length as to deliver it from the upper end to the tank; or, as shown in the present case, the upper end of the pump-barrel B may be provided with a tight cover and stuffing-box, through which the pump-rod K passes, and the water may be delivered through a valve T into a pipe U, which discharges into the tank V. By thus subdividing the work of each pump and making it independent of the other I am enabled to equalize the pressure upon each of the cranks and the pumping mechanisms, so that only about one-half of the column of water is to be lifted at one time.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

A lift-pump consisting of the two independent pump-barrels connected as shown, the reciprocating pistons and piston-rods, the oppositely-moving cranks whereby the pistons are reciprocated, and the connecting-rods uniting the cranks with the piston-rods and having the swivel-heads S in a vertical line one above the other, so that the cranks and crank-shafts may turn about a vertical center represented by the line of the swivels without deranging the action of the pumps, substantially as herein described.

In witness whereof I have hereunto set my hand.

ORRIN W. PARKER.

Witnesses:
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H. C. LEE.