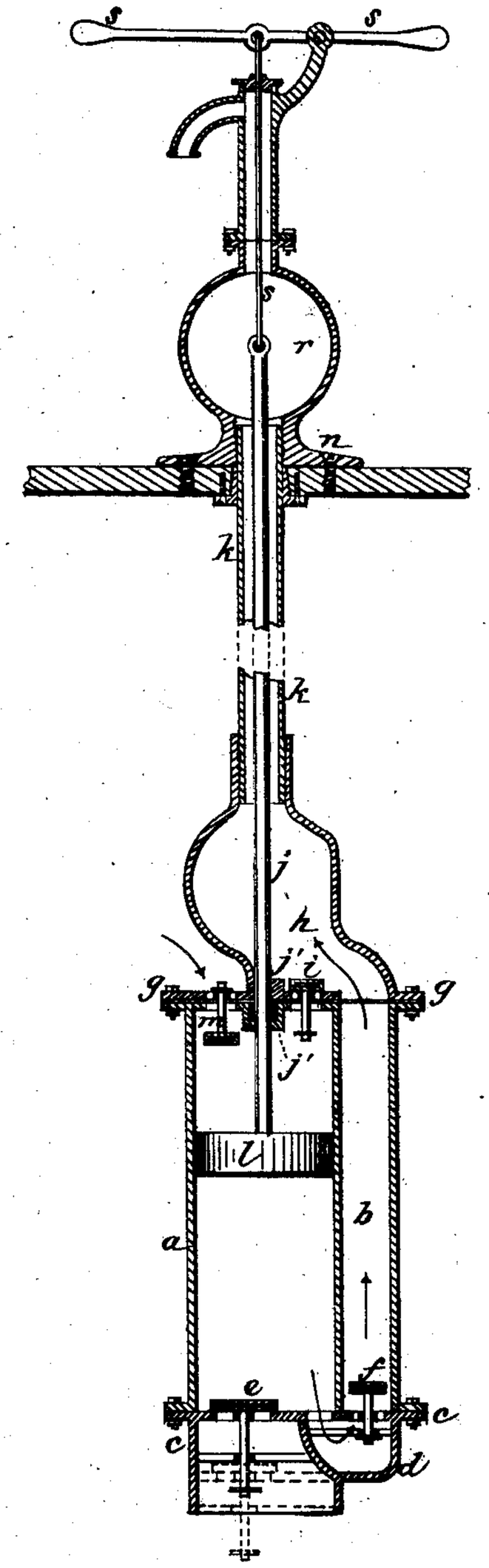
(No Model.)

F. D. McCARTEY.

SUBMERGED PUMP.

No. 244,909. Patented July 26, 1881.



Witnesses:
Edmond Brodhag.
L Bacon

Inventor:
Francis D. McCartey.
by Johnson and Johnson
Attys

UNITED STATES PATENT OFFICE.

FRANCIS D. McCARTEY, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF TO CHARLES C. McCARTEY, OF KNOXVILLE, TENNESSEE.

SUBMERGED PUMP.

SPECIFICATION forming part of Letters Patent No. 244,909, dated July 26, 1881.

Application filed May 31, 1881. (No model.)

To all whom it may concern:

Be it known that, FRANCIS D. McCARTEY, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented new and useful Improvements in Submerged Pumps, of which the following is a specification.

My improved pump is of the kind known as the "submerged double-acting force-pump," in which the piston-cylinder communicates at its bottom with a side discharge-chamber communicating with a chamber with which the piston-cylinder also communicates at its top, the said piston-cylinder receiving water at the top and at the bottom, and discharging at the bottom and at the top.

My improved pump is specially designed for deep-bored wells, and is suspended therein by the discharge-pipe from the base of a chamber placed at the top of the well. In this construction the top chamber has a direct communication with the top and bottom of the piston-cylinder through the side discharge-chamber of said cylinder, and chambers formed respectively with the top and bottom cylinder-heads. The piston-rod works within the suspending discharge-pipe and through the top cylinder-chamber, and is thereby prevented from buckling, and admits of the use of a piston-rod of great length, of comparatively little weight, and renders the pump effective in raising and forcing water in a continuous stream with a power sufficient to throw it several hundred feet with an easy working of the pump-handle.

The accompanying drawing represents a vertical section of a submerged pump embracing my improvement.

The cylinder *a* is cast with a side chamber, *b*, open at top and bottom. The lower cylinder-head, *c*, is cast with a depressed chamber, *d*, which forms a communication between the cylinder and its side chamber, *b*, at one side of the valve *e*, through which the water flows into the bottom of the cylinder, while a valve, *f*, at the bottom of the side chamber, and opening therein, controls its communication with the cylinder. This depressed chamber *d* allows the outflow of the water from the cylinder with little friction, and the easy working of the valve *f*, the stem of which extends through a guide-web in said depressed chamber. The top cylinder-head, *g*, is also cast with a chamber, *h*, which communicates with the side chamber, *b*, and also with the top of the cylinder by a valve, *i*, opening within said top chamber. This top chamber, *h*, extends over from the side chamber, *b*, to a central position with the cylinder, for two purposes—viz., to inclose the piston-rod *j* and its stuffing-box *j'*, and to obtain a central suspending-support for the cylinder by the discharge-pipe *k*, which screws into the top of said chamber, and through which the piston-rod passes—the objects of which construction are to admit of the use of a light-working rod for the piston *l*, and to suspend the cylinder centrally with its discharge-pipe, and thereby prevent lateral cramping in the working of the piston-rod.

The stuffing-box *j'* is formed by a nipple projecting from the head of the cylinder extending therein, and having a recess to receive packing. The cylinder receives water at its upper end by the valve *m*, which opens inward.

The discharge-pipe is in sections screwed together, and is preferably of gas-pipe about an inch and a half in diameter, while the working piston-rod is also of screwed sections of gas-pipe about three-eighths of an inch in diameter, so that in wells of great depth it would not be possible to use such a light-working piston-rod were it not for the support which is given it throughout its length by the discharge-pipe, which practically serves as a bearing for said rod against lateral deflection. The discharge-pipe is screwed into and suspended from the base-plate *n* of the chamber *r* placed at the top of the well, and the working piston-rod extends into this chamber, and is jointed therein to the handle-rod *s*.

The suspending discharge-pipe connects with a chamber at each end, within which the piston-rod works, and the cylinder has direct communication with these chambers at its top by the valve *i*, and at its bottom by the side chamber, *b*, and the lower depressed chamber, *d*, so that in operating the pump the upstroke of the piston closes the valves *m* and *f* and opens the valves *i* and *e*, forcing the water into

the top chamber, *r*, and in the downstroke of the piston the valves *i* and *e* close, and the water is forced into said chamber *r* through the bottom chamber, *d*, the valves *f* and *m* being open.

I have shown drop-valves, and prefer to use such construction; but flap-valves may be used.

The cylinder-heads are flanged and packed in the usual manner.

Suspending the pump-cylinder centrally with and by a discharge-pipe connecting with a chamber at its receiving and discharging end, the piston-rod working through said suspending discharge-pipe and within its connected chambers, and the arrangement and connection of the discharge-pipe chambers *h* and *r* with the side and depressed chambers, *b* and *d*, are the matters which constitute my improved construction of submerged pump, and by which it is rendered so effective and easy of operation.

The pump can be used in ordinary wells, in which case the cylinder must be braced from the side walls, and it can be of any desired size.

I have shown and described the lower cylinder-head chamber, *d*, as being formed at one side of and below the lower inlet-valve, *e*; but said chamber *d* may be made the full area of the cylinder and of the side chamber, *b*, below the valve *f*, as shown by dotted lines, so as to give a full force and free passage of the water through the valve *f*, the inlet-valve *e* being then below the valve *f*, instead of on a line with it, as shown.

I claim—

1. In a submerged pump, the cylinder *a*, formed with the side chamber, *b*, and suspended centrally with and by a discharge-pipe, *k*, connecting with a chamber at each end above the pump-cylinder, substantially as described, in combination with a piston-rod, *j*, arranged within said suspending discharge-pipe, and the top champer, *r*, into which said suspending-pipe discharges, substantially as described, for the purpose specified.

2. A submerged pump the cylinder of which is formed with a side chamber, *b*, its lower head with a depressed chamber, *d*, and its upper head with a chamber, *h*, and suspended centrally with and by a discharge-pipe, *k*, connecting with a top chamber, *r*, the said chamber *h* inclosing the stuffing-box *j'*, the discharge-pipe inclosing and supporting the piston-rod, and the cylinder provided with inlet and outlet valves at each end, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

FRANCIS D. McCARTEY.

Witnesses:

ADOLPH F. MARTIN,

HOLLAND SMITH.