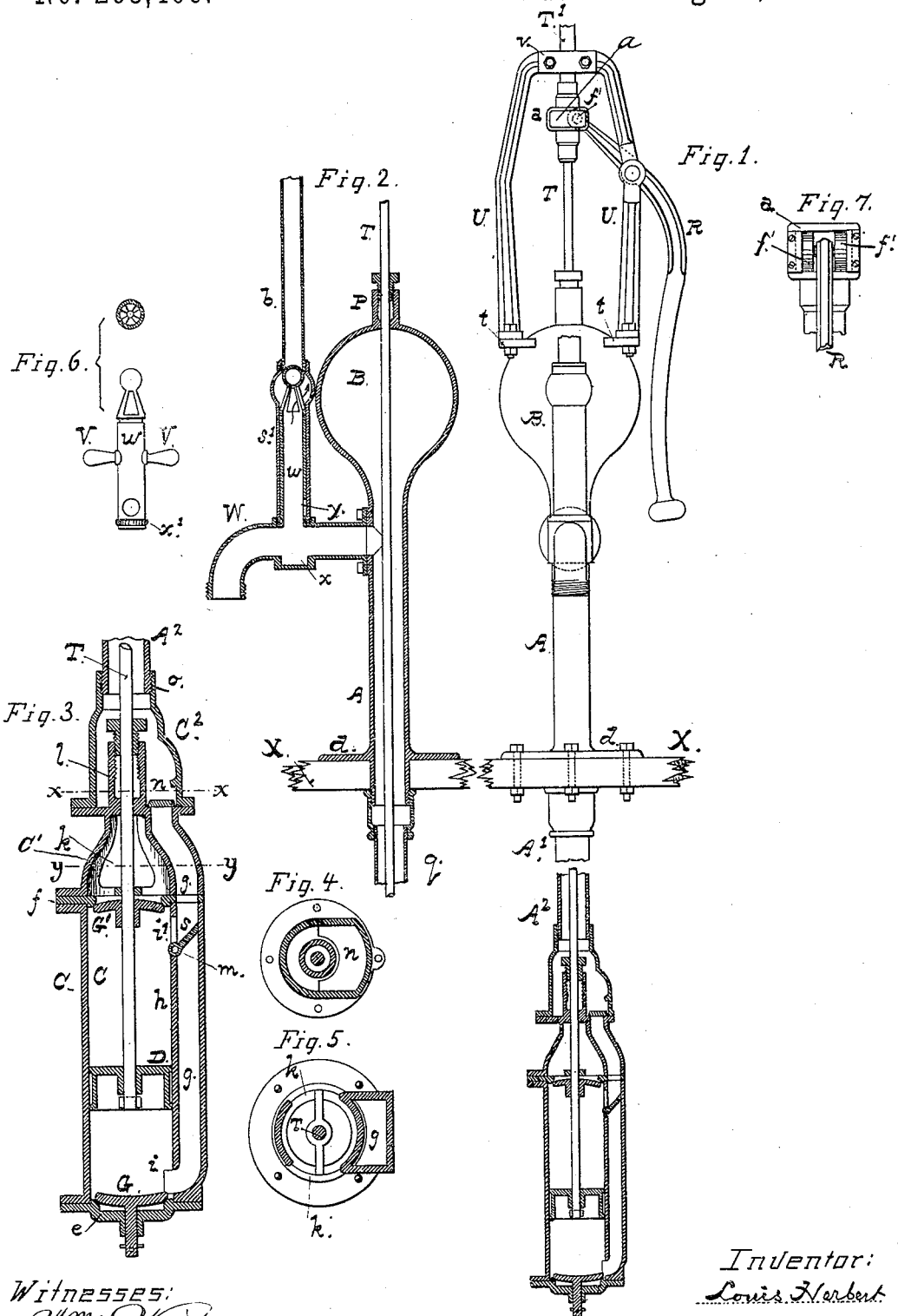


(No Model.)

L. HERBERT.
SUBMERGED PUMP.

No. 263,406.

Patented Aug. 29, 1882.



Witnesses:

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SUBMERGED PUMP.

SPECIFICATION forming part of Letters Patent No. 263,406, dated August 29, 1882.

Application filed September 1, 1881. (No model.)

To all whom it may concern:

Be it known that I, LOUIS HERBERT, of Hicksville, in the county of Sacramento and State of California, have invented certain new and useful Improvements in Submerged Pumps; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings.

My invention relates to improvements in submerged double-acting pumps.

It consists in certain novel construction and combinations of parts by which I am enabled to provide a cheap, simple, effective, and easily-operated hand-pump, as will be more fully set forth and described hereinafter.

The accompanying drawings herein referred to show, in Figure 1, an elevation of my improved pump and the manner of securing it in position for operation over the well or shaft, the pump-cylinder with its plunger and valves being in section. Fig. 2 shows the air-chamber and upper structure of the pump and the cut-off valve or device for changing the course of the discharged stream, the parts being shown in section. Fig. 3 is an enlarged section of the pump cylinder or chamber containing the plunger and valves. Figs. 4 and 5 are cross-sections through the lines *xxyy*, Fig. 3. Fig. 6 is a detail of the construction of the cut-off deflecting-valve. Fig. 7 is an end view taken from the left-hand side of Fig. 1.

A is the tube that forms the body of the pump. It is composed of sections or lengths of pipe properly coupled together, with the pump-cylinder secured to the lower end, while its upper end terminates in an air-chamber. This air-chamber B is an enlargement of the first section of tube A, and by means of a flange, *d*, near the lower end, this part of the structure, which is above the supporting-platform X, is secured and held in position. The end of the tube-section below this flange receives the remaining sections, A' A², so that the entire pump-body is suspended from and supported by this flange in a firm and stable manner.

C is the cylinder or pumping-chamber, which is immersed in the body of water below, and takes the water at each stroke of the plunger into the inlet at the bottom and through the

side apertures or perforations provided at the top of the cylinder. Each of these inlets is controlled by inwardly-acting valves acting against the valve-seats *ef*, and the water, when drawn in at the stroke of the plunger in one direction, is forced into the water-way on the side of the chamber through the inlets, whence it is raised into the tube A up to the discharge. By referring to Fig. 3 of the drawings it will be seen that this chamber is composed of three sections, C C' C², bolted together by means of the flanges, provided one upon the other, and forming a cylindrical compartment for the plunger or piston D and a passage or water way, *g*, leading therefrom and connecting with the tube or body of the pump. The section *c* contains the valves and plunger, and has also the compartment or water-way divided from it by the partition *h*, but connected with it through the outlet-apertures *i i'*, the upper one of which is closed by the clapper-valve *s*. This valve *s* works on a pintle, *m'*, that passes through the body of the chamber from the outside, and it controls both the passage in the water-way when the plunger is moving upward and the aperture *i* at the time the plunger is moving downward, as will be understood from the sectional view, Fig. 3.

The seat for the upwardly-acting valve G is formed by the plate *e*, secured on the bottom of the chamber C, while the upper valve, G', acting downward, has a seat against the ring *f'*, which is placed on the end of the section C before the next one, C', is fixed in place. These parts therefore are easily detachable and can be readily removed for cleaning and repairing. The middle section, C', has openings or perforations *k*, through which the water enters, and is drawn into the cylinder C through the valve G' at each downward movement of the plunger, and it has also the closed passage *g*, which connects with and forms a continuation of the water-way *g* in the cylinder C. Upon the top end of this section is also formed a stuffing-box, *l*, for the plunger-rod T, and over the passage or water way *g* is an upwardly-acting valve, *n*, which is raised by the pressure of the water beneath it. This valve is seen in Figs. 3 and 4. It is placed in the passage above the water-way for the purpose of obtaining a continuous flow of water as soon as

the pump is started, as without it the water must be raised every time from the pump-cylinder up into the tube and chamber before a flow can be obtained of the discharge. In locations where the pump would be exposed during cold weather this valve *n* can be dispensed with and the water allowed to run back into the cylinder to prevent freezing; but in such case, while the pump will operate to raise the water just as well, the flow will not take place until the plunger is worked long enough to fill the tube. The third section, *C*², is fixed over and incloses the stuffing-box *l* and the valve *n*, and is joined to the end of the lowest section, *A*'', of the upright tube or body of the pump. The water-space of this section *C*² is gradually contracted as it rises above the valve *n*, and it terminates in a cylindrical end, *o*, to connect with the tube *A*'. This construction gives a simple compact form of plunger-chamber, and provides for ready access to the working parts.

The plunger-rod *T* is carried up through the center of the tube *A A'* and out at the top of the air-chamber through a stuffing-box, *P*, at the top. Guides *q q* are fixed in the sections of tubes *A* at intervals to hold the rod in proper vertical position. To connect the rod with the operating-lever *R*, I fix upon the end of the rod a yoke, *a*, with internal slots, *a' a'*, along each side, to receive and guide two rollers, *f' f'*, that are carried by the end of the lever. The hand-lever *R* is supported by the frame *U*, which is bolted to lugs *t t* provided for the purpose on the top of the air-chamber, and this frame is formed of the two uprights and the cross-head *v*, which forms a guide for the rod *T* above the yoke, so that the plunger-rod is caused to work in vertical position. These parts *a f' f'* change the oscillation of the hand-lever into a vertical reciprocating motion of the plunger rod. This gives a regular even stroke, and is a strong and simple attachment for connecting the rod and operating-lever together. The frame *U v* gives a strong and substantial support for the lever, and serves also as a guide for the plunger-rod, as before stated.

The discharge from the pump is through the spout *W*, which leads from the side of the body *A* just below the chamber or enlargement. At this point, also, I provide a simple effective means for directing the discharging stream and turning it into a conducting-pipe, *b*, to be led off to a distance when required. This consists of the short cylinder *s'*, extending upward from and around an opening in the upper side of the spout, and connected at the end with a pipe, *b*, leading off to any distant part of discharge. Within this cylinder is a sliding tubular valve, *w*, open at the top and at one side, which is capable of a vertical movement into and out of the space within the spout, so that by pushing this tube down into the spout *W* the outlet from the spout will be shut off, and the water will then flow into the opening *y* and rise up through the tube *w* and into the pipe above. The end of this tube *w*, when pushed

down to cut off the stream, is received into a seat, *x*, formed in the bottom of the space within this spout, so that no water can pass beneath it, and a packing, *x'*, fixed around the end of the tube to produce a tight joint at this point. To move this cut-off and deflecting valve, I provide two vertical slots in the sides of the cylinder diametrically opposite to each other, and through these slots two short arms or handles, *V V*, fixed to the sides of the tube *w*, project in such manner that by grasping one of the handles in each hand the valve can be readily moved up or down as required. This construction is clearly shown in Figs. 1 and 6.

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

1. In a submerged pump, the pump-cylinder described, composed of the several sections *C C' C*², the lower one, *C*, being provided with the upper and lower valves, *G' G*, covering the top and bottom of the chamber, the second section, *C'*, having a closed top supporting a stuffing-box, and having openings for the entrance of water, and the upper section, *C*², having solid walls, the lower and second sections having a side passage, *g*, separately formed along the side, and connected with the upper and lower portions of the lower cylinder, substantially as set forth.

2. In a pump, the combination of the section *C*, having upper and lower ingress-valves, *G' G*, and upper and lower exits, *i i'*, with a separate connection, *g*, between the two, and an automatic valve, *s*, controlling both exits, with the section *C'*, having the inlets *k*, formed above the valve *G'*, and the section *C*², provided with the valve *n* at its junction with section *C'*, and connected with the pump-stock or a length of pipe leading therefrom above, substantially as set forth.

3. The combination, with the discharge-spout *W*, leading from the body *A*, of the cylindrical extension *s'*, connecting with the conducting-pipe *b*, and the sliding cut-off and deflecting tube-valve *w*, applied and operating substantially as and for the purpose described.

4. The combination, with the tube-section *A*, having the large chamber on the upper end and the supporting-flange *d*, of the frame *U v*, secured thereto by lugs *t t* and bolts, and having bearings and supports for the hand-lever *R* and a guide for the plunger-rod *T*, substantially as set forth.

5. In combination with the lever *R*, pivoted in the frame *U v*, and having the friction-rollers *f' f'* at the outer end, the yoke *a*, fixed on the plunger-rod *T*, in which are the lateral slots *a'* for the rollers to work in, substantially as described.

In witness whereof I have hereunto set my hand and seal.

LOUIS HERBERT. [L. S.]

Attest:

S. PARKS,

W. H. COVERTS.