A. RIDDELL.

PUMP.

No. 182,710. Patented Sept. 26, 1876.

Fig. 1.

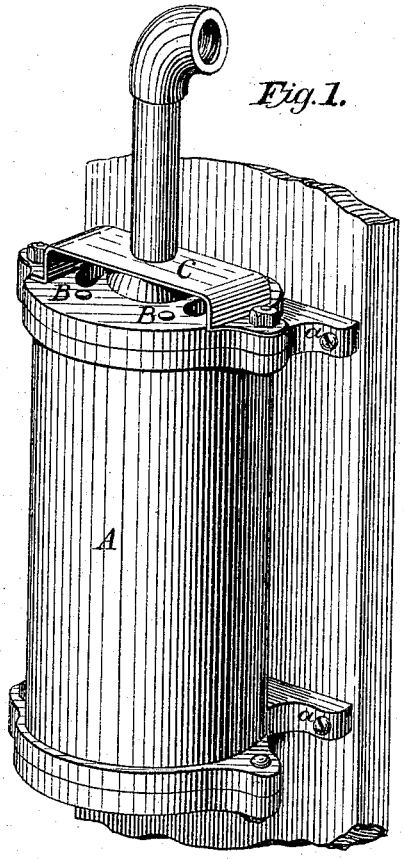


Fig. 2.

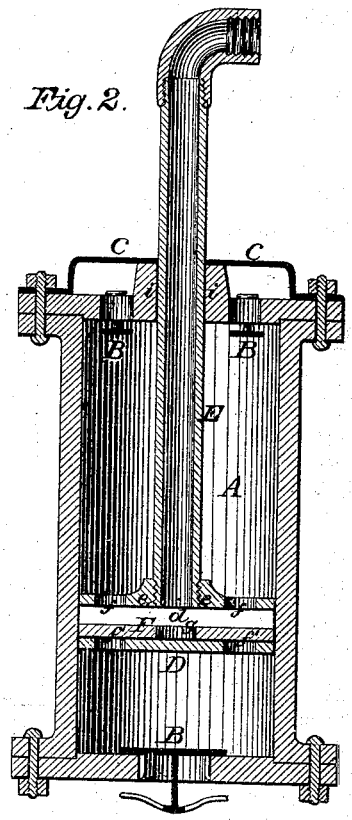
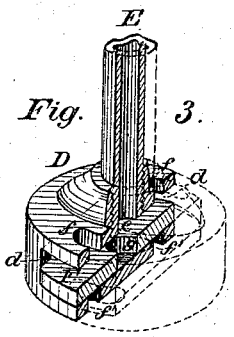


Fig. 3.



Attest:

C. F. Fritz
Jno. D. Madigan

Inventor:

Archibald Riddell

by Louis Bagger & Co.

Atty's.

UNITED STATES PATENT OFFICE.

ARCHIBALD RIDDELL, OF GUELPH, ONTARIO, CANADA.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **182,710**, dated September 26, 1876; application filed April 26, 1876.

To all whom it may concern:

Be it known that I, ARCHIBALD RIDDELL, of Guelph, in the county of Wellington, Province of Ontario and Dominion of Canada, have invented certain new and useful Improvements in Pumps; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification, and in which—

Figure 1 is a perspective view. Fig. 2 is a longitudinal section, and Fig. 3 shows the piston or plunger detached.

Similar letters of reference indicate corresponding parts in all the figures.

This invention relates to that class of pumps known as submerged pumps, and is double acting—that is, it throws the water on both up and down stroke. It consists in the construction and combination of parts hereinafter more fully shown and described.

In the drawing, A is the cylinder, which is provided with lugs *a*, by which it may be attached to a plank or other structure in the well or cistern where the pump is to be used. The valves B, of which there is one in the bottom and two in the top, consist of metallic plates having guides that fit into the valve-holes, as shown, and suitably-shaped projections for retaining them in place. Over the top valve is placed a metallic cover or sheet, C, the object of which is partly to prevent the valves from becoming blocked up when used in wells where there is danger of falling stones or other rubbish.

The construction of the plunger or piston will be easily understood by reference to Fig. 3 of the drawings. It consists of a metallic cylinder, D, having a horizontal perforation or slot, *d*. The top of this cylinder has a screw-threaded perforation, into which is inserted the piston or plunger rod E, which is tubular, being, preferably, made of gas-pipe of any suitable dimensions. Upon each side of the central perforation *e* is another suitably-shaped perforation, *f*, these latter being directly above corresponding perforations *f'* in the bottom of the cylinder. Into slot *d* I insert a metallic plate, F, which fits into it exactly, so that it may easily slide up and down. Plate F has a central perforation, *g*, corresponding with perforation *e* in the top of the cylinder. The top plate of cylinder A has a central perforation, *i*, through which rod or tube E projects and is operated.

The manner in which my improved pump operates will be easily understood from the foregoing description.

When the piston is in its normal position the cylinder A is full of water above it, and plate F in piston D covers the two perforations *f'* in the bottom of this latter, thus cutting off all communication with the part of the cylinder below the piston. When the piston is raised by means of the tubular plunger-rod E, the top valves B are closed by the pressure of the water, and the water in cylinder is thus forced through perforations *f* in the top of the piston through the central perforation *e* in the top of the same and into the plunging-rod, from the top of which it is discharged. While this operation is going on the water enters the lower end of the cylinder through the bottom valve B, and when the piston is forced downward this is closed, and the pressure of the water forces plate F in the piston upward, thus closing perforations *f*, and allowing the water to enter the piston and plunger rod through perforations *f'*. I usually prefer to operate my pump by means of the tubing E, which is thus made to serve a double purpose; but in very deep wells or cisterns I prefer to make the tubing stationary, and operate the piston by means of a rod, working either inside or outside of the tubing.

I am aware that plungers for pumps, having a reciprocating perforated disk-valve, are not new, and I do not claim the principle broadly; but I am not aware that the pump-pistons have been used having, like mine, a vertical slot or perforation, *d*, in which the disk or plate F slides. This construction is preferable, inasmuch as it is easier to grind the plate to a seat, (it having two straight edges;) there is less wear, and it may be more easily taken out for cleansing—an operation which is not unfrequently rendered necessary

in cisterns or wells containing vegetable or other impurities.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. The combination of the submerged cylinder A, having valves B and protecting covering-plate C, with the plunger herein described, consisting of tubular piston-rod E and piston D, the latter having transverse slot or opening *d*, intersected by vertical perforations *f f'* and plate F, all constructed and combined to operate substantially in the manner and for the purpose shown and specified.

2. In a submerged pump, A, the protecting covering-plate C, arranged over the top valves so as to prevent their becoming blocked or choked up, substantially as and for the purpose described.

In testimony that I claim the foregoing as my own I have affixed my signature in presence of two witnesses.

ARCHIBALD RIDDELL.

Witnesses:
JAS. S. SPERR,
JOHN MACSTINGER.