

(No Model.)

2 Sheets—Sheet 1.

W. H. & C. A. HOLCOMBE.

DOUBLE ACTING PUMP.

No. 297,400.

Patented Apr. 22, 1884.

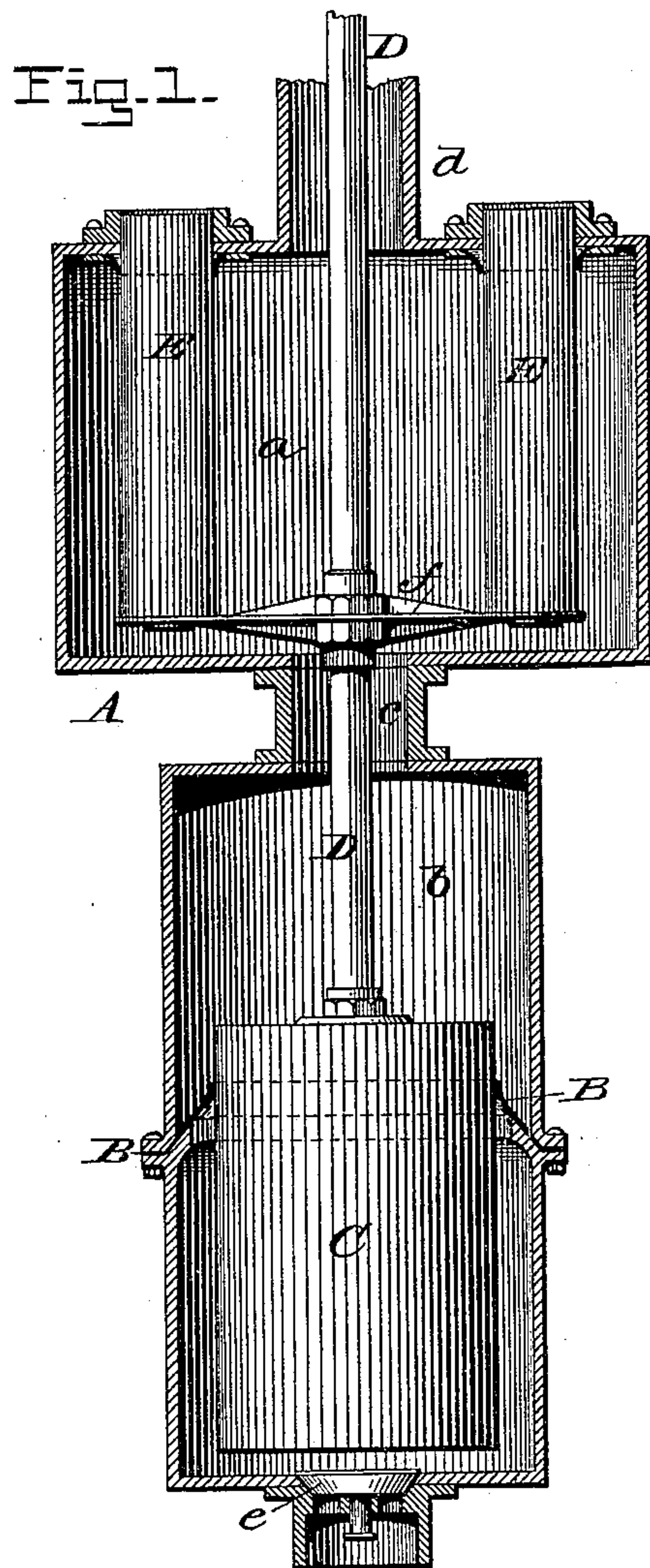
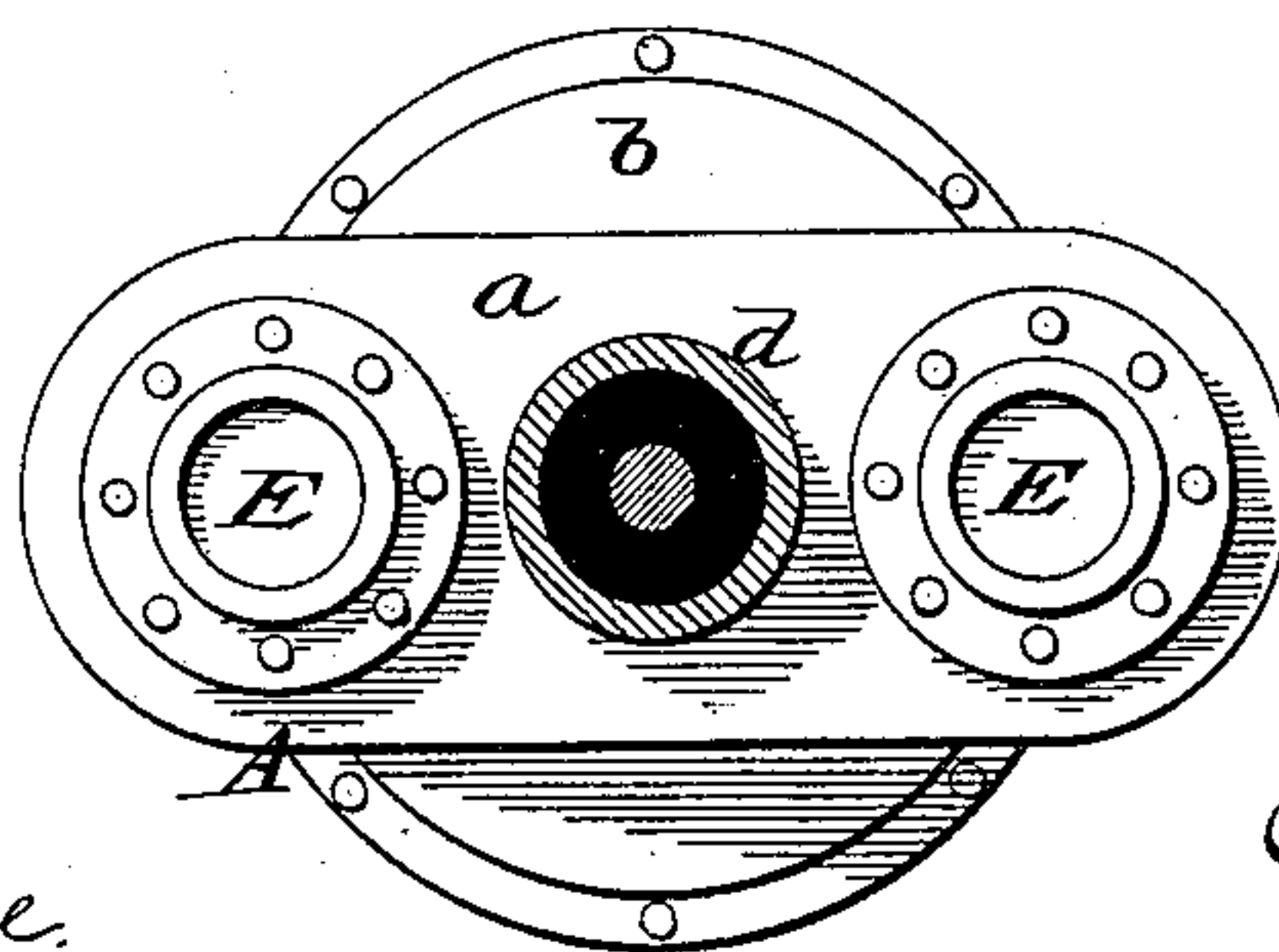


Fig. 2



WITNESSES

*Jas. F. DuRoiel*  
*Walter S. Dodge*

INVENTORS

*William H. Holcombe,*  
*Clifford A. Holcombe,*  
*by Dodger & Son,*  
*Attys.*

(No Model.)

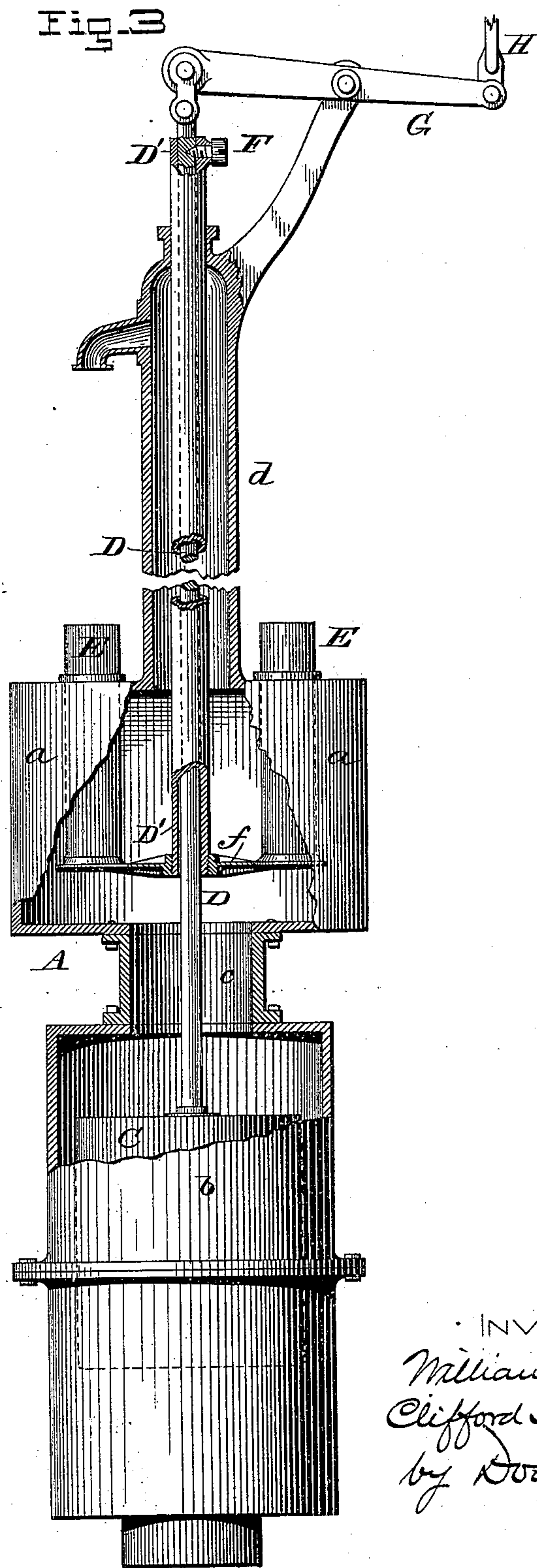
2 Sheets—Sheet 2.

W. H. & C. A. HOLCOMBE.

DOUBLE ACTING PUMP.

No. 297,400.

Patented Apr. 22, 1884.



WITNESSES:

Jas. F. Duffin  
Walter S. Dodge

INVENTORS

William H. Holcombe  
Clifford A. Holcombe,  
by Dodge & Son,  
Attys.



# UNITED STATES PATENT OFFICE.

WILLIAM H. HOLCOMBE AND CLIFFORD A. HOLCOMBE, OF BELOIT, WISCONSIN, ASSIGNORS TO THE HOLCOMBE BROTHERS AND STONE MANUFACTURING CORPORATION, (LIMITED,) OF SAME PLACE.

## DOUBLE-ACTING PUMP.

SPECIFICATION forming part of Letters Patent No. 297,400, dated April 22, 1884.

Application filed January 22, 1883. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM H. HOLCOMBE and CLIFFORD A. HOLCOMBE, of Beloit, in the county of Rock and State of Wisconsin, have invented certain Improvements in Double-Acting Pumps, of which the following is a specification.

This invention relates to an improvement upon the pump for which we filed application for Letters Patent on the 23d day of November, 1882; and the improvement consists in a novel arrangement of the main and secondary pistons, whereby a central outlet may be conveniently used.

In the accompanying drawings, Figure 1 represents a vertical longitudinal section through the pump case or body; Fig. 2, a top plan view; and Fig. 3, a sectional view, showing arrangement of piston-rods.

The present pump is designed to act upon the same principle as the one described in our former application above referred to, but to overcome the necessity which existed under that construction of forming the outlet at one side—a plan which in practice necessitates bracing the pump in a manner both expensive and inconvenient.

A represents the pump case or body, which is now constructed with an upper chamber, *a*, and a lower chamber, *b*, connected by a tubular neck, *c*, as shown in Fig. 1, the upper chamber being furnished with a central outlet-pipe, *d*, and the lower chamber having at its lower end an upwardly-opening inlet-valve, *e*.

About midway of the height of the cylinder or chamber *b* is arranged a combined packing-ring and valve, constructed and arranged as in our Patent No. 269,523, dated December 26, 1882—that is to say, it consists of a ring, *B*, of leather or other flexible material, secured to the walls of the cylinder or chamber, extending upward at an angle, and resting at its upper edge against the surface of the piston *C*, the weight of water above causing the packing to hug the piston closely, and the downward pressure of the piston upon the water causing it to force its way upward between the piston and the packing-ring, as will be readily understood. The piston *C* is secured upon and carried by a

rod, *D*, which passes upward centrally through the outlet-pipe *d*, and which carries, by means of a cross-bar, *f*, two or more smaller pistons, *E E*, both working through openings in the top of the chamber *a*, which openings will be packed in any suitable manner, but preferably by leather or other flexible rings set at an angle and arranged to bear at their free edge against the surface of the piston. Under this arrangement it will be seen that the upper and lower pistons will move in unison, and the action will be as follows: The piston-rod being raised, the pistons rise, creating a vacuum in the chambers, whereupon the water forces up the valve *e* and enters the lower part of chamber *b*. The pistons being next forced down, piston *C* (pressing upon the water in the lower part of chamber *b*) forces it upward between the piston and its packing *B* into the upper part of chamber *b*. At the next rise of the pistons, piston *C* forces the water from above it through the tubular neck *c* into chamber *a* and out through outlet *d*, at the same time drawing a fresh supply into lower part of chamber *b*, by which time the upper and lower chambers are filled. The descent of the pistons again occurring, piston *C* forces water into the upper part of chamber *b*, while the pistons *E* (passing down into chamber *a* and displacing a quantity of water equal to their cubic contents) force a part of the water contained in chamber *a* up through pipe *d*, and these actions being repeated, a continuous flow of water through pipe *d* is secured.

It is obvious that more than two pistons may be used in chamber *a*, and that their form may be varied, as also the manner of packing them.

In Fig. 3 I have represented the upper and lower pistons carried by separate rods—the lower piston, *C*, by the rod *D*, and the upper pistons, or the cross-bar *f* which supports them, by a tubular rod, *D'*, encircling the first, and provided with a set-screw, *F*, by which the two rods may be firmly united and caused to move in unison, or by loosening which the tubular rod may be allowed to remain at rest and the pistons *E* be thereby thrown out of action. This construction is rendered desirable by the fact that when the pumps are used



for pumping from a considerable depth the rods are liable to spring or bend on the down-stroke if the pump is made to force water on both strokes, whereas by disconnecting the pistons E in the manner explained the lower piston alone is made to raise the water, and that only on the upstroke, which produces only a tensile strain on the rod. This is especially important for pumps designed for use in connection with windmills, where they are often subjected to severe strain and usage.

G represents a pump handle or lever, and H a rod or pitman for connecting it with a windmill, if desired.

It will be observed that chamber *a* is made materially larger than the pistons E, and therefore a considerable body of water will be contained therein, which causes the flow to be steady and regular.

While we have shown and described, and prefer to use, two pistons E in the upper chamber, we desire it to be distinctly understood that we do not limit ourselves to this number, as it is apparent that the principle of operation is the same whether one or more be used.

We are aware of the patent granted to W. T. Greenleaf, dated July 16, 1861, No. 32,831, and we make no claim to the construction therein shown and described.

Having thus described our invention, what we claim is—

1. In a double-acting pump, the combination of a case or body consisting of two communicating chambers, one above the other, the upper chamber having a central outlet-pipe, and provided with a piston working through the top of the chamber, and the lower chamber containing an elongated piston, and provided with an upwardly-opening valve about midway of its height, encircling the piston, and with an inlet-valve at its lower end, the respective pistons being connected to and operated by a rod common to all, and passing through the central outlet, substantially as shown and described.

2. The herein-described pump, consisting of case A, containing chambers *a b*, the former

provided with outlet *d* and the latter provided with valves B and *e*, piston E, working in and passing through the top of chamber *a*, piston C, working in chamber *b*, and the piston-rod D, common to both the pistons, passing through the outlet *d*, substantially as shown and described.

3. In a pump, the combination of two separate pistons carried by independent rods, said rods adapted to be connected or disconnected at will, substantially as and for the purpose specified.

4. In combination with cylinder A, having upper and lower chambers, *a* and *b*, piston C, arranged to act in the lower chamber, piston E, arranged to act in the upper chamber, and independent rods connected, respectively, with pistons C and E, and adapted to be connected with or disconnected from each other, substantially as described.

5. The herein-described pump, consisting of case or body A, having chambers *a b*, the latter containing a valve at its bottom and another about midway of its height, piston C, carried by rod D, pistons E, carried by rod D', and set-screw F, adapted to connect or disconnect the two rods, as required.

6. In a double-acting pump, the combination of an upper chamber having a central outlet, and pistons passing through the wall or top of the chamber on opposite sides of said outlet, a lower chamber containing a valve at its lower end, a piston, and a valve about midway of the height of the chamber, between the piston and the walls of the chamber, the lower piston being carried by a rod extending upward to the lever or operating device, and the pistons E being carried by a tubular rod encircling the first, and adapted to be connected therewith or disconnected therefrom, substantially as explained.

WILLIAM H. HOLCOMBE.  
CLIFFORD A. HOLCOMBE.

Witnesses:

CHARLES NEWBURGH,  
MYERS A. CARY.