3 Sheets—Sheet 1

C. SCHMIDT.

Double Acting Force-Pump.

No. 205,688. Patented July 2, 1878.

Fig. 1.

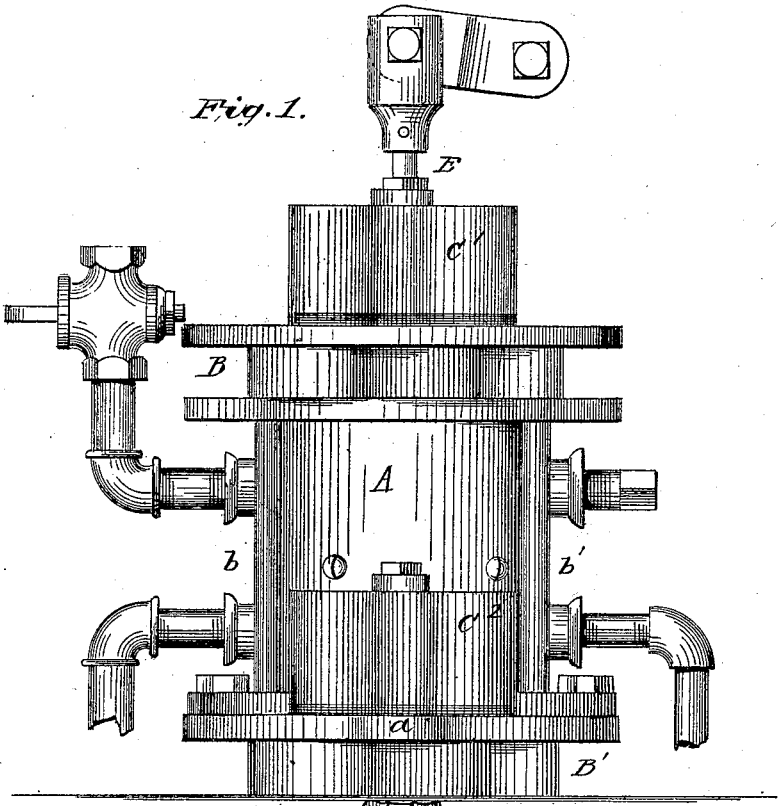
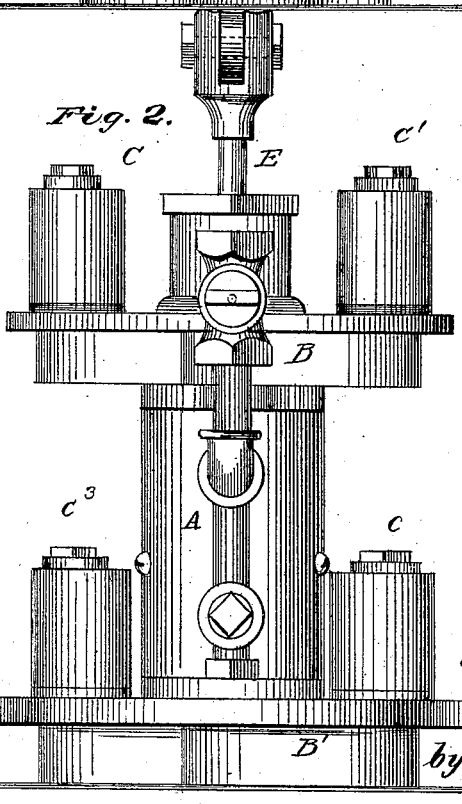


Fig. 2.



Witnesses
Fred G. Dieterich
August Thurau.

Inventor
Christian Schmidt,
by Louis Bagger & Co
attorneys

C. SCHMIDT.

Double Acting Force-Pump.

No. 205,688. Patented July 2, 1878.

Fig. 3.

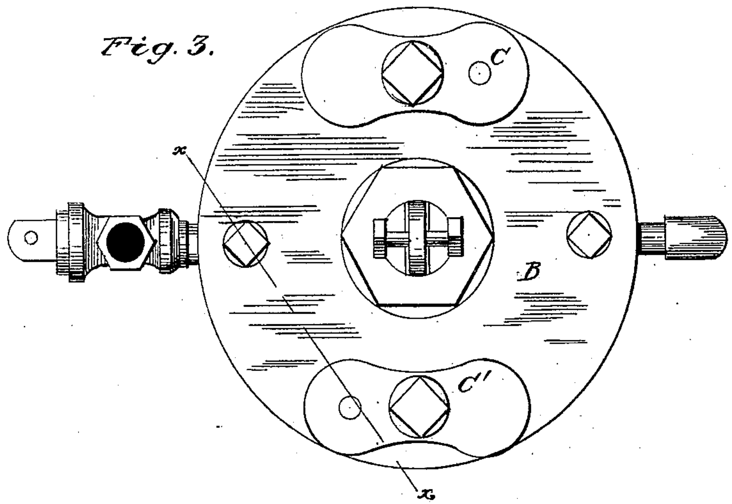
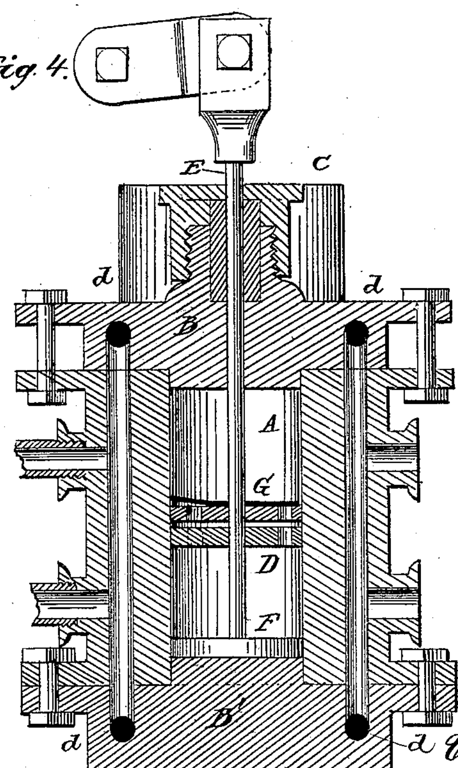


Fig. 4.



Witnesses
Fred G. Dieterich
August Peterson

Inventor
Christian Schmidt,
by: Louis Bagger & Co.
attorneys.

3 Sheets—Sheet 3.

C. SCHMIDT.

Double Acting Force-Pump.

No. 205,688. Patented July 2, 1878.

Fig. 6.

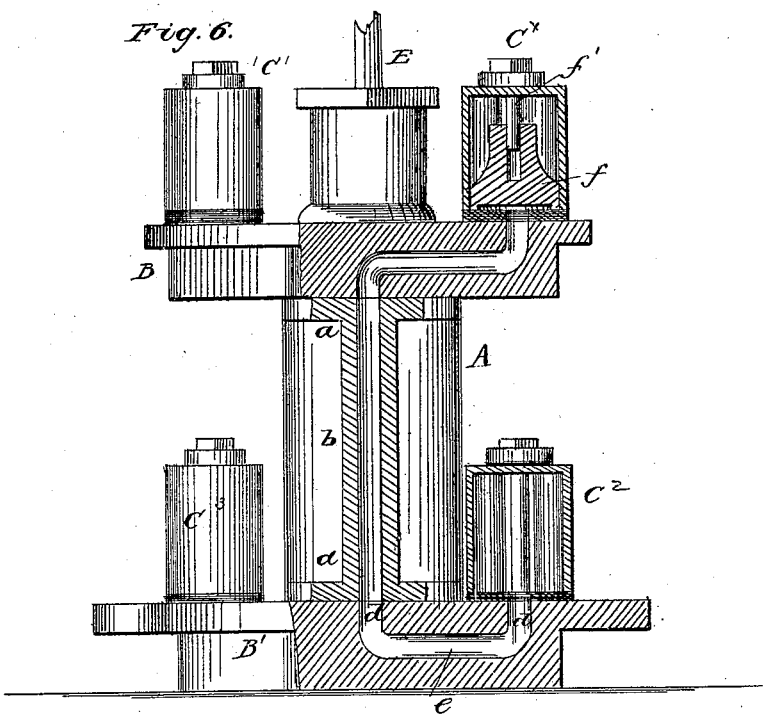


Fig. 5.

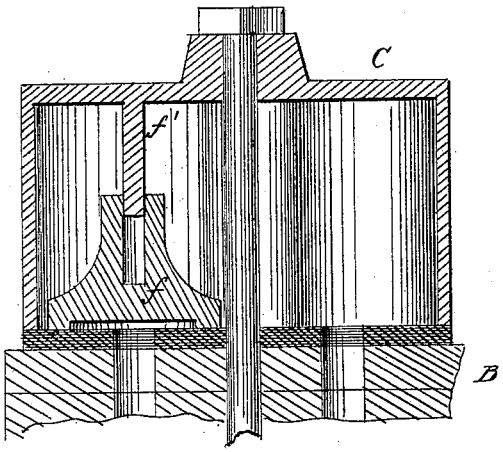
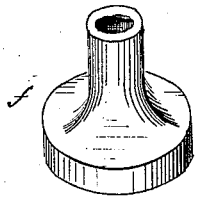


Fig. 7.



Witnesses
Fred G. Dieterich
Augustus Petersohn.

Inventor
Christian Schmidt,
by Louis Bagger & Co.
Attorneys.

UNITED STATES PATENT OFFICE.

CHRISTIAN SCHMIDT, OF LANCASTER, PENNSYLVANIA.

IMPROVEMENT IN DOUBLE-ACTING FORCE-PUMPS.

Specification forming part of Letters Patent No. **205,688**, dated July 2, 1878; application filed March 18, 1878.

To all whom it may concern:

Be it known that I, CHRISTIAN SCHMIDT, of Lancaster, in the county of Lancaster and State of Pennsylvania, have invented certain new and useful Improvements in Double-Acting Force-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, which form a part of this specification, and in which—

Figure 1 is a front view. Fig. 2 is a side elevation. Fig. 3 is a top plan. Fig. 4 is a vertical transverse section. Fig. 5 is a sectional view of one of the valve-chambers. Fig. 6 is a sectional view after the line *x x*, Fig. 3; and Fig. 7 shows, in perspective, one of the valves detached from the pump.

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

This invention relates to certain improvements in double-acting force-pumps, as I shall now proceed more fully to describe with reference to the drawings hereto annexed, in which—

A is the body of the pump, and B B′ are the top and bottom pieces, respectively. The body A is a cylinder having at the top and bottom laterally-projecting wings *a a*, connected by tubes *b b′*, which may be cast in one piece with the cylinder. The top and bottom pieces have each two valve-chambers, C^2 C^3 C C^1, each of which consists of a double cylinder, forming a continuous chamber, and secured with a screw-bolt, a piece of leather or rubber packing being interposed.

The tube *b* connects at its lower end with a perforation, *d*, in the bottom piece B′, from which a channel or passage, *e*, formed or cast in the bottom piece, leads to the valve-chamber C^2, where it terminates at the valve *f*, which, like the rest of the valves, consists of a metallic disk or cup having an upwardly-projecting stem, in which a recess is formed, so that it may slide upon a stem or rod, *f′*, projecting downwardly from the top of the valve-chamber. From the valve-chamber C^2 another channel or passage leads to the bottom of the cylinder. From thence a third passage leads to the valve-chamber C^3, where its opening is covered by a valve, and from the chamber C^3 a fourth passage leads to the tube *b′*, with which the exit-pipe is connected.

Similarly, the tube *b*, at its upper end, connects with a hole in the top piece B, from which a passage leads to valve-chamber C, where it opens under a valve. From chamber C a passage leads to the top of the cylinder, and from thence a third passage to valve-chamber C^1, where its opening is covered by a valve. From valve-chamber C^1 a fourth passage leads to the exit-pipe through tube *b′*.

In the center of the cylinder a perforated diaphragm, D, is rigidly secured, having a central bearing for the piston-rod E. The latter carries two pistons, of which the lower one, F, is solid, while the upper one, G, has two valves opening upwardly.

The operation and advantages of my improved pump will be readily understood from the foregoing description, taken in connection with the drawings hereto annexed.

The tubes *b b′* may be branched off, so that the water may be taken from two or more places and delivered through several pipes without inconvenience.

The general construction is simple, the valves and chambers being all alike, as well as the top and bottom pieces, which may both be cast in the same mold. It is easily operated, the stroke of the piston-rod being very short, and the stream delivered by the pump is continuous and unbroken, owing to the arrangement of the valve-chambers, which also serve as air-chambers.

The course of the water through the pump is as follows: When the piston is moved upward, the water enters through tube *b*, perforation *d*, passage *e*, under the valve *f* in chamber C^2, from whence it passes to and fills the bottom of the cylinder. At the same time the water in the upper portion of the cylinder is forced under the valve in chamber C^1, which it fills, and is from thence forced out through tube *b′*. On the downstroke the water passes through tube *b* into chamber C, and from thence into the upper portion of the cylinder, while the water contained in the bottom thereof is forced into chamber C^3, and from thence out through tube *b′*.

The valves of my improved pump operate by

gravity, and are so constructed and arranged that they cannot possibly be displaced; hence the pump is not apt to get out of order, no matter how much it is used.

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

1. The combination, with the cylinder A, having wings *a a*, connected by tubes *b b'*, open at both ends, of the top and bottom pieces B B', having valve-chambers C C^1 C^2 C^3, and passages leading from the top and bottom of tube *b*, respectively, to valve-chambers C C^2, from thence to the top and bottom of the cylinder, then to valve-chambers C^1 C^3, and finally to the top and bottom of tube *b'*, substantially as and for the purposes herein shown and specified.

2. The improved double-acting pump herein described, consisting of the cylinder A, having wings *a a*, connected by open tubes *b b'*, diaphragm D, secured midway in the cylinder, piston-rod E, having pistons F G, and top and bottom pieces B B', having passages, valves, and valve-chambers C C^1 C^2 C^3, all constructed, arranged, and operating substantially as herein described, for the purposes shown and specified.

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

CHRISTIAN SCHMIDT.

Witnesses:

BENJAMIN W. HARNISH,

WILLIAM B. PYFER.