(No Model.)

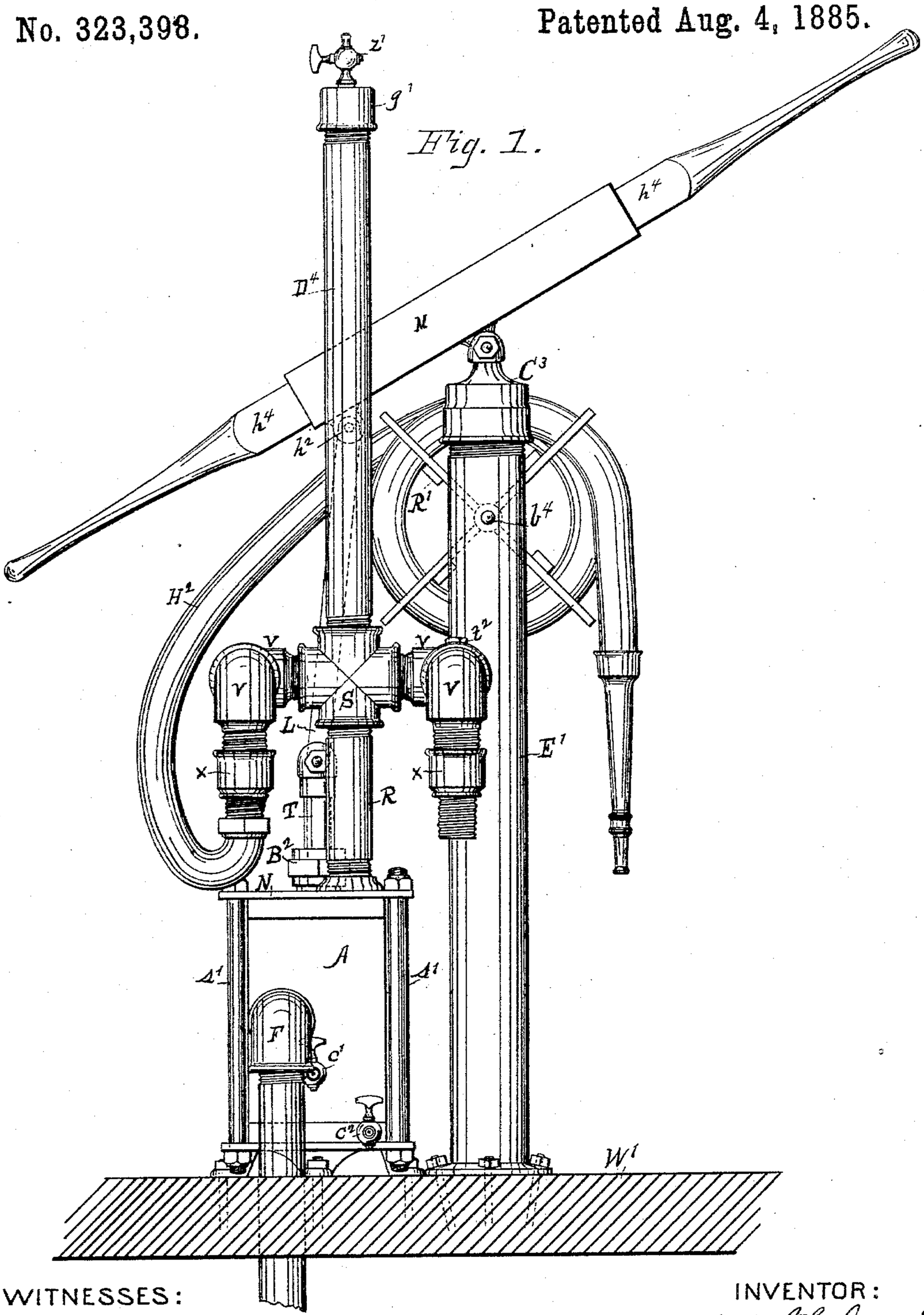
2 Sheets—Sheet 1.

D. R. CLOUD.

DOUBLE ACTING PUMP.

No. 323,398. Patented Aug. 4, 1885.

Fig. 1.



WITNESSES:

C. A. Preston

C. W. Russell

INVENTOR:

Daniel R. Cloud

By

Roscoe B. Arthur

Atty

(No Model.) 2 Sheets—Sheet 2.

D. R. CLOUD.

DOUBLE ACTING PUMP.

No. 323,398. Patented Aug. 4, 1885.

Fig. 2.

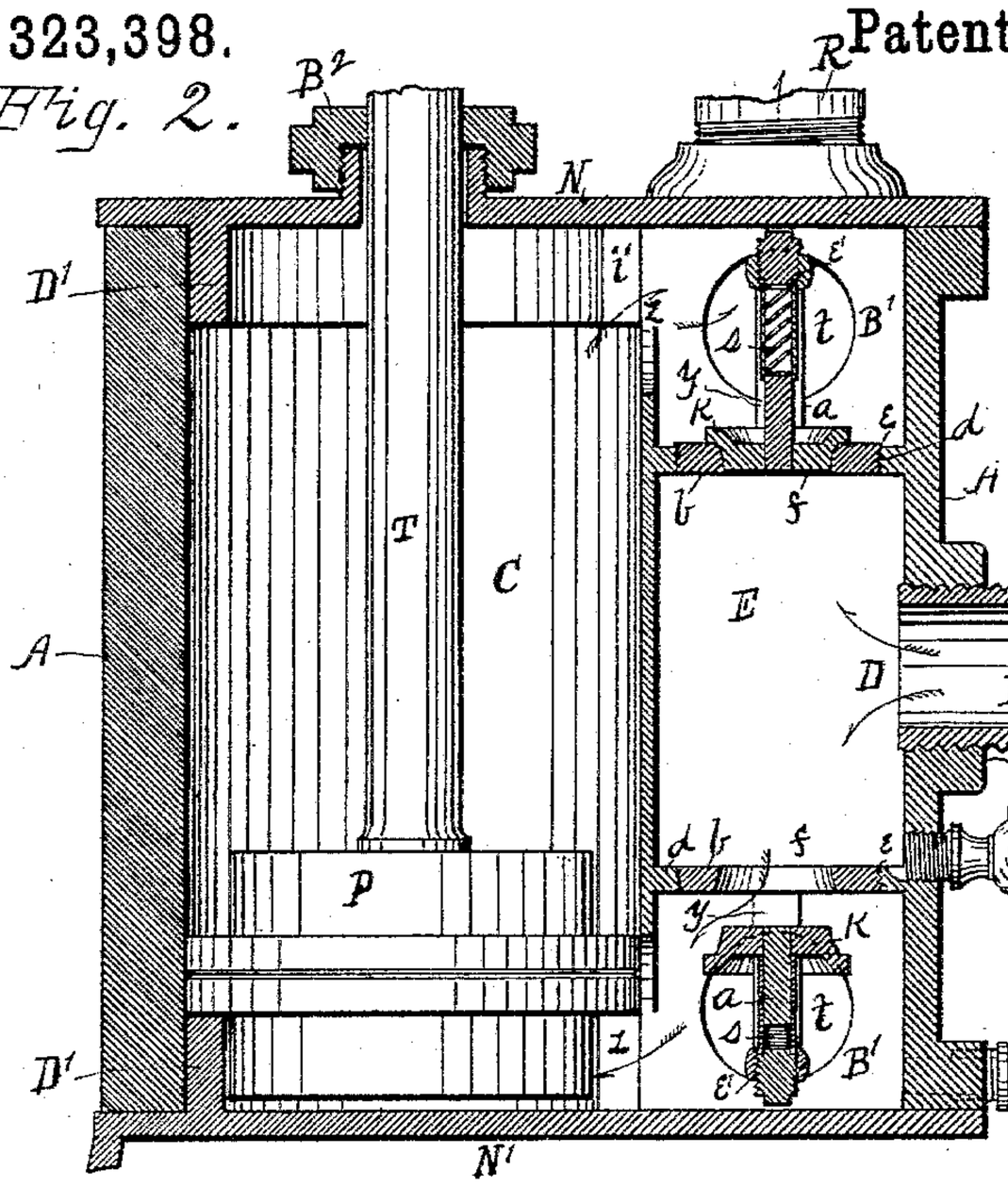


Fig. 6.

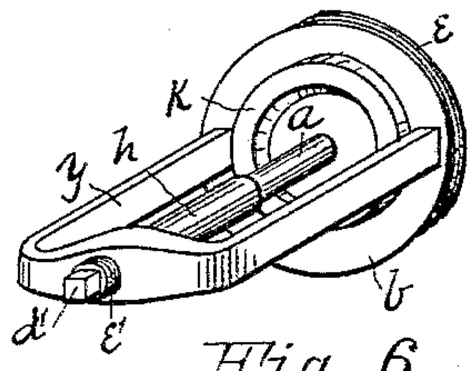


Fig. 3.

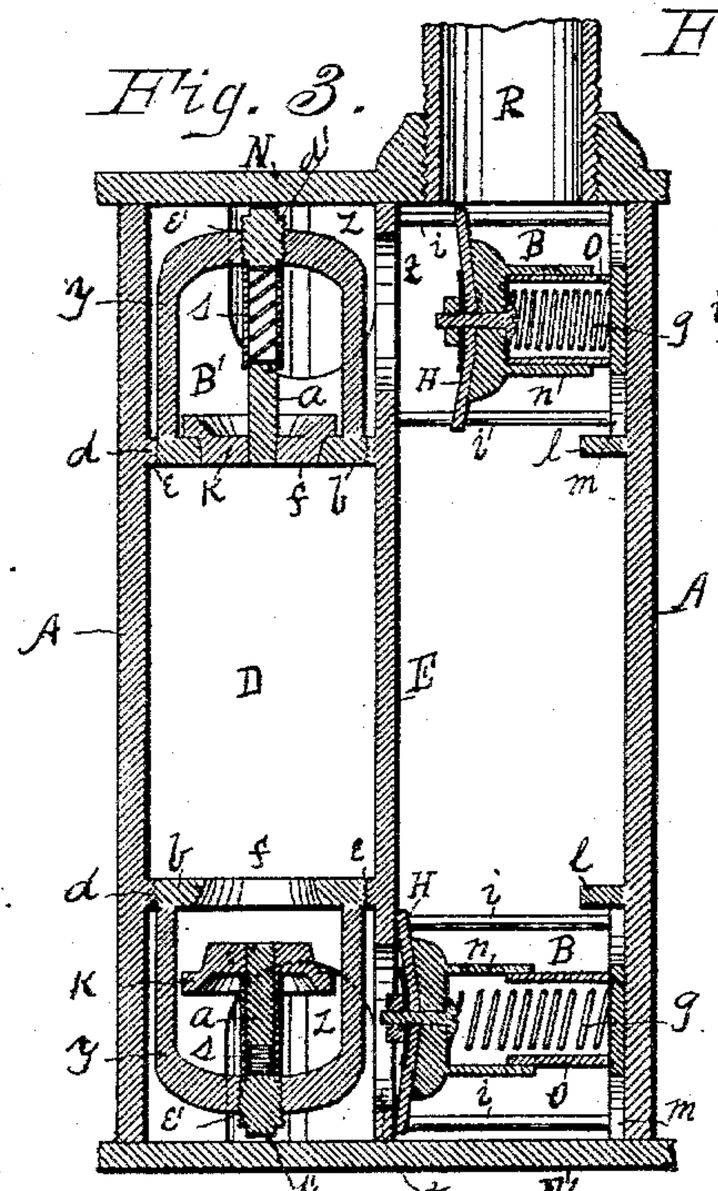


Fig. 5.

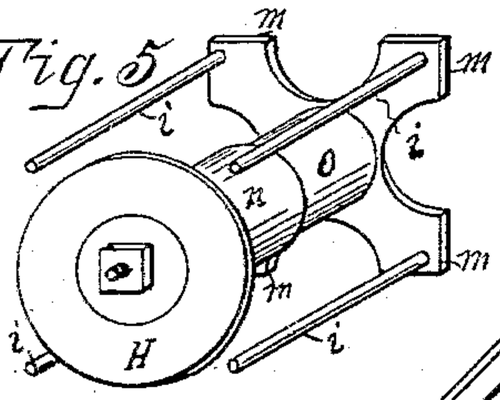


Fig. 4.

WITNESSES:

C. A. Preston

C. W. Russell.

INVENTOR:

Daniel R. Cloud

Per Rowe & Shelton

Attys

UNITED STATES PATENT OFFICE.

DANIEL R. CLOUD, OF DETROIT, MICHIGAN.

DOUBLE-ACTING PUMP.

SPECIFICATION forming part of Letters Patent No. 323,398, dated August 4, 1885.

Application filed May 22, 1885. (No model.)

To all whom it may concern:

Be it known that I, DANIEL R. CLOUD, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Double-Acting Pumps; and I do declare the following to be a full, clear, and exact description of the invention, such as 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 the letters and figures of reference marked thereon, which form a part of this specification.

The nature of my invention in double-acting pumps relates to the employment of valves in duplicate working horizontally with valves in duplicate working vertically, with but one plunger, said valves and plunger working in cells formed integral with the body of the pump in casting, the object being to produce a strong, positive, and easy-acting pump at a nominal cost; and my invention consists in the arrangement of parts, as hereinafter set forth, and pointed out in the claims.

In the drawings forming a part of this specification, Figure 1 is an isometrical perspective view of my device in elevation. Fig. 2 is a section in elevation on dotted lines 2 2 of Fig. 4. Fig. 3 is a longitudinal section in elevation on dotted line 1 1 of Fig. 4. Fig. 4 is a top plan having head and valves removed. Figs. 5 and 6 are isometrical perspective views of the valves, as will be hereinafter fully set forth.

A represents the body of the pump, which is formed in one part, having the valve-chambers B B B′ B′, the ledges *l l* and *d d*, the partition E, having valve-openings *t t*, and the supply-openings *z z*, leading from the valve-chambers B′ B′ to the cylinder C of the pump. All of the foregoing parts are formed integrally with the body of the pump. To the front of said body I attach the supply or suction pipe F, leading into the central chamber, D, located between the valve-chambers B′ B′, as shown in Fig. 2.

At the bottom of the central chamber I locate a vent-cock, C′, and leading from the bottom of the lower valve-chamber, B, is a drip-cock, C^2. The valves K have a valve-stem, *a*. Said valves are seated in a circular base, *b*, having valve-opening *f*. Said cicular base is screw-threaded at *e*, and is screwed into the internally-threaded ledges *d d*, as shown in Figs. 2 and 3. The yokes Y are formed integral with the bases *b*, having a screw-threaded hole at *e′*, into which I screw the thimble *h*, having the screw-threaded head d^2. (See Figs. 2 and 6.) The valve-stem *a* passes within the thimble *h*, the free end pressing against the coiled spring *s*, housed within said thimble, as shown in Figs. 2 and 3. The degree of pressure upon the valves K is obtained by adjusting the thimbles *h* within the yokes Y by turning the head *d′*. Said valves are located in a vertical position, one over the other, with the supply or suction pipe located between them leading into the central chamber, D, as clearly shown in Fig. 2. The valves H are provided with thimbles *n*, fitting over the thimbles *o*, containing the coiled springs *g*, which is common. The thimbles *o* are formed integral with the base, having the arms *m*. Anchored to said arms are guides or supporting-pins *i*. Said pins are located in a horizontal position within the valve-chests B B, as shown in Fig. 3, the arms *m* meeting the ledges *l l*, which support them, the free ends of the pins *i* meeting the wall or face of the partition E, whereby said valves are held in position opposite the ports *t t*. (See Fig. 3.)

The discharge-pipe R is located over the upper valve-chamber, B, receiving the water as it is forced through the valve-openings *t t*. Said pipe is attached to the top plate or head, N, of the pump. Said head is provided with an annular flange, D′, which fits snugly within the barrel or cylinder C of the pump, being cut out at *i′* in front of the port *z*, as shown in Fig. 2. Said plate extends over the valve-chambers B B′, as shown in Figs. 2 and 3. The bottom head or plate, N′, is formed with a like annular flange, D′, fitting into the lower end of the cylinder C, as shown clearly in Figs. 2 and 4, being also cut out at *i′* in front of the lower port, *z*. The head also passes over the lower valve-chambers, B B′. Said plate is provided with ears W; also the upper plate, and through the holes *a′* the bolts *s′* pass, thus securing the heads to the pump-body.

P is the piston head or plunger working in the cylinder C, and T is the piston-rod working through the stuffing-box B^2.

Pivoted to the upper end of the piston-rod is a coupling-rod, L, the upper end of which is pivoted to the ear h^2 of the handle-plate M. Said plate is pivoted at the center to the cap C^3, mounted upon the upright pipe or fulcrum-support E′. Said support is located at the side of the pump, and is anchored to the curb-plank W′, as shown in Fig. 1. The handle-plate is hollow, and is adapted to receive the handles h^4, by which the piston-head is driven.

In Fig. 1 I show a four-way coupling, S, mounted upon the discharge-pipe R, having the stand-pipe D^4, with cap g' and vent-cock z', thus forming an air-chamber. Attached to the horizontal openings of the coupling S are elbow-couplings v v. To the outer elbows I attach reducers x x. Between the elbows at the right hand I locate the cut-off plug t^2. When said plug stands open, and the hose-pipe is detached, I have two discharges. When the hose-pipe H^2 is coupled, as shown in Fig. 1, and the water is cut off from the right-hand discharge by the plug t^2, the water is all forced through the hose, having full pressure of the pump, enabling me to throw a strong stream.

I attach to the upright F′, by means of a bolt, b^4, the reel R′, for supporting the hose ready for use.

In pumping the movements of the parts are as follows: As the piston-head P of Fig. 2 is drawn up by the action of the handle h^4, the valve K in the lower chamber, B′, opens, as shown in Fig. 2, the valve K over it closes, as shown in said view, when the water in the cylinder over the piston-head is forced out through the upper port z, closing the upper vertical valve, passing through the valve-opening t, forcing back the upper horizontal valve H in chamber B, as shown in Fig. 3, the water flowing into the outlet R. As the lower valve K drops, a vacuum is formed in chamber D, thus drawing water through the supply-pipe F into said chamber, through the valve-openings f into the bottom of the cylinder, through the lower port z, following the piston-head in its upward movement, the lower horizontal valve closing the lower valve opening t as the lower vertical valve opens the port f. As the piston-plunger descends the upper horizontal valve closes the upper port t. The upper vertical valve rises at the same time the lower vertical valve closes the port f. The pressure of the water forces back the lower horizontal valve, opening the lower port t, the water under the piston-head being forced out into the chamber leading to the discharge-pipe. At the same time the water is drawn through the supply-pipe F, as indicated by the upper arrow of Fig. 2, through the upper ports, f and z, filling the cylinder over the piston-head.

It will be observed from the foregoing, to each movement of the piston-head there is a movement of all of the valves; that the piston-head in its ascending and descending lifts and forces the water, thus throwing a continuous stream.

The opening of the vent-cock C′ admits air into the chamber D, when the water in said chamber returns through the supply-pipe into the well to prevent freezing. Opening the drip-cock C^2 carries the water out of the bottom of the pump.

Having thus fully set forth my present invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a pump, substantially as specified, the combination of the body containing the barrel C, the valve-chambers and ledges, with chamber D, the partition E, having ports t t, the U-shaped supply-openings leading from the chambers B′ B′ into the barrel C, said parts formed integral, the valves, as set forth, the plates N N′, having the annular flanges D′, with cut-out portion i', said flanges fitting within the barrel, as specified, the bolts for securing said plates to the body of a supply and discharge pipe, as set forth, the piston-head, and means for operating said piston-head, substantially as set forth.

2. In a pump, as set forth, the combination of the valve-chamber B, the ledge, the valve H, its thimble n, fitting over the thimble o, containing the coiled spring, and the arms m, supporting the guide-pins i, the free ends of said pins engaging with the wall of the valve-chamber, as and for the purposes set forth.

3. In a double-acting pump, the combination of the body having the parts formed integral, as set forth, of the horizontal valves and ports t t, the vertical valves, as specified, having ports f f, of the piston-head operated by means, substantially as set forth, of the plates N N′, the plate N having stuffing-box and discharge-pipe R, said pipe located vertically over the horizontal valves, of a supply-pipe located between the horizontal valves and leading into the chamber D, of a vent and drip cock, and bolts for securing the heads to the body, as and for the purposes specified.

4. In a pump, substantially as set forth, the body A, having the chambers formed integrally therewith, and the plates N N′, adapted to fit over said chambers, said plates having the annular flanges D′, with cut-out portions i', fitting within the ends of the barrel C, as and for the purposes specified.

In testimony whereof I affix my signature in presence of two witnesses.

DANIEL R. CLOUD.

Witnesses:
R. B. WHEELER,
B. F. WHEELER.