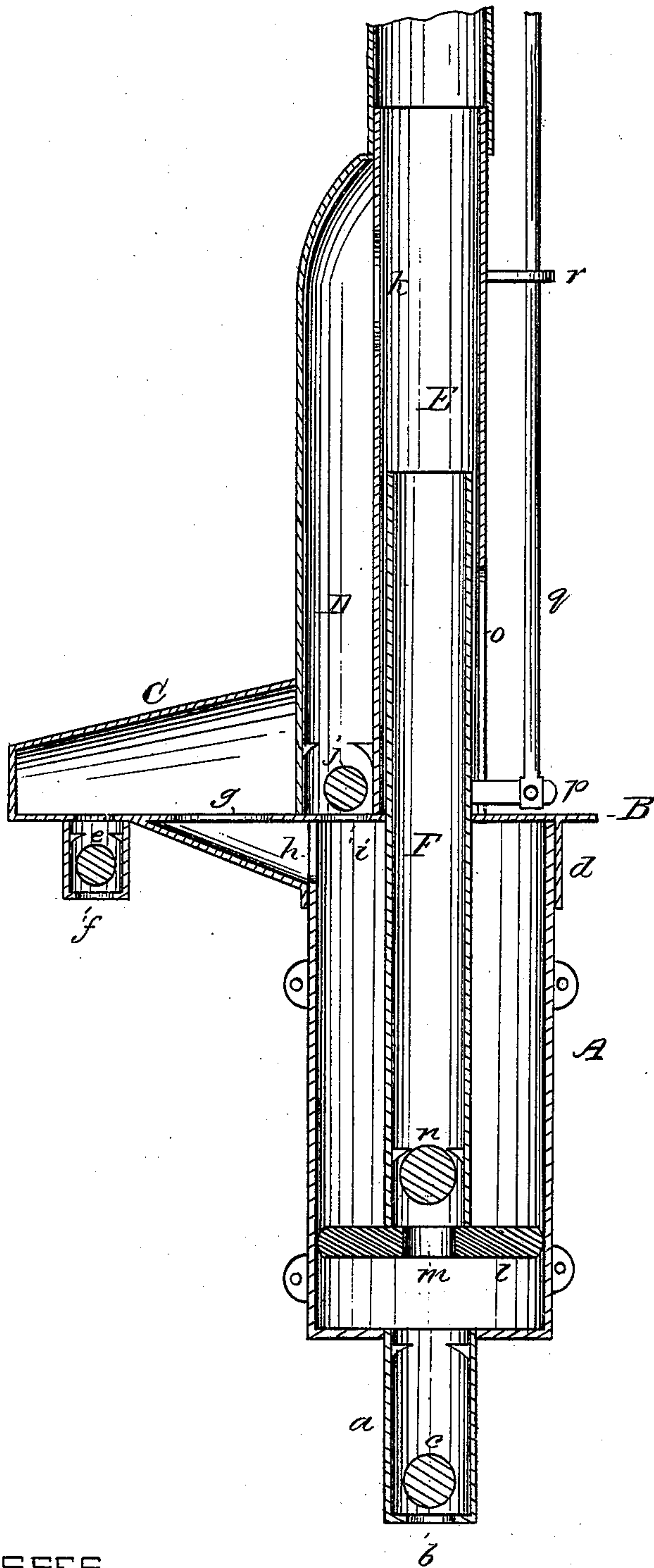


H. VAN DOREN.
DOUBLE ACTING PUMP.

No. 171,592.

Patented Dec. 28, 1875.



WITNESSES
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UNITED STATES PATENT OFFICE.

HENRY VAN DOREN, OF SOUTH BRANCH, NEW JERSEY.

IMPROVEMENT IN DOUBLE-ACTING PUMPS.

Specification forming part of Letters Patent No. **171,592**, dated December 28, 1875; application filed November 4, 1875.

To all whom it may concern:

Be it known that I, HENRY VAN DOREN, of South Branch, in the county of Somerset and State of New Jersey, have invented a new and valuable Improvement in Double-Acting Pumps; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

The figure of the drawing is a representation of a vertical longitudinal section of my improved pump.

This invention has relation to double-acting force-pumps; and its object is to produce a pump simple in construction, and at the same time perfect in its operation, in insuring a continuous flow of water from the discharge pipe or nozzle; and the invention consists in constructing the upper portion of the pump with its several water-passages separate from the cylinder, and with an annular connecting-flange, which slips over the upper rim of the cylinder, and securely connects the two together. My invention also consists in the combination and arrangement of the several parts composing the pump, as will be hereinafter more fully described, and subsequently pointed out in the claims.

In the accompanying drawings, A represents the cylinder, formed at its lower end with a supplemental cylinder or tube, *a*, with an opening, *b*, through which the water passes into the cylinder, and is controlled by a ball or other suitable valve, *c*. The several water-passages and operating parts of the pump are connected to a flat base-plate, B, the same formed with an annular connecting-flange, *d*, by which it may be readily slipped over upon the end of the cylinder, firmly securing the two together. The plate B has formed thereon a horizontal water-passage, C, with valve *e*, which controls the supply of water through the opening *f*. This horizontal water-passage C communicates with the pump-cylinder A through opening *g* and an opening, *h*, in the upper portion of the cylinder, from whence the water is forced, through opening *i*, in the base-plate B, raising the valve *j*, and allowing the water to pass into

a tube, D, which communicates through the opening *k* into an upper cylinder, E. The purpose of locating the valve *e* away from the main cylinder A, and independent thereof, is to remove all obstruction from within the cylinder that would tend to impede the course of the water upon the upward stroke of the piston; and the horizontal chamber C forms a charger for the main cylinder, so that no water will escape back into the well, but the full capacity of the cylinder A is obtained, thereby insuring a much steadier flow of water. A hollow piston-tube, F, with plunger *l*, works within the cylinder A, the plunger being formed with a suitable opening, *m*, controlled by a valve, *n*, through which the water enters the tube upon the downward stroke of the plunger *l*. The cylinder E has an elongated opening, *o*, to insure free play of the brace or connection *p*, the same being secured to the piston-tube F, and operated by a rod, *q*, guided in its movement by a plate, *r*.

In describing the operation of my invention it should first be understood that the piston-tube F, with plunger *l*, is raised, and the cylinder A below the same filled with water. At the downward stroke of the plunger the water will be forced up through the opening *m*, raising the valve *n*, and passing out through the piston-tube F, while at the same time the space above the plunger *l* is filling with water through the openings *f g h*. Upon the upward stroke of the plunger the water above the same is forced through the opening *i*, raising valve *j*, and closing valve *e*, the water in its course passing into tube D, out through opening *k*, and into cylinder E, the water again passing into the space below the plunger to be forced through the piston-tube F upon the downward stroke of the same, thereby causing a continuous flow of water.

The simple manner of connecting the operating parts of the pump to the cylinder by the base-plate B with the annular flange *d* removes the necessity of bolts or clamping devices heretofore employed, and thereby renders the upper portion of the pump, with its several water-passages and valve-connections, capable of being easily removed from the cylinder for repairs or other purposes; also, the peculiar construction of the water-passages in relation to

each other, with the hollow piston and plunger, is such as forms together a simple and perfect double-acting pump, and one that may be manufactured at a greatly-reduced cost.

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

1. The hollow piston F, with plunger *l* and valve *n*, and the cylinder A, formed with opening *h*, in combination with tube D and cylinder E, and horizontal cylinder or water-passage C, with valve *e*, said passage or cylinder having opening *g*, the same forming a charger or supply for the main cylinder A, substantially as and for the purpose specified.

2. The base-plate B, with its water-passages C D E, said plate having formed thereon a downwardly-projecting collar or flange, *d*, for securely connecting the base-plate to the cylinder A, substantially as and for the purpose set forth.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

HENRY VAN DOREN.

Witnesses:

JAMES BOWMAN,
GEORGE G. VAN DYKE.