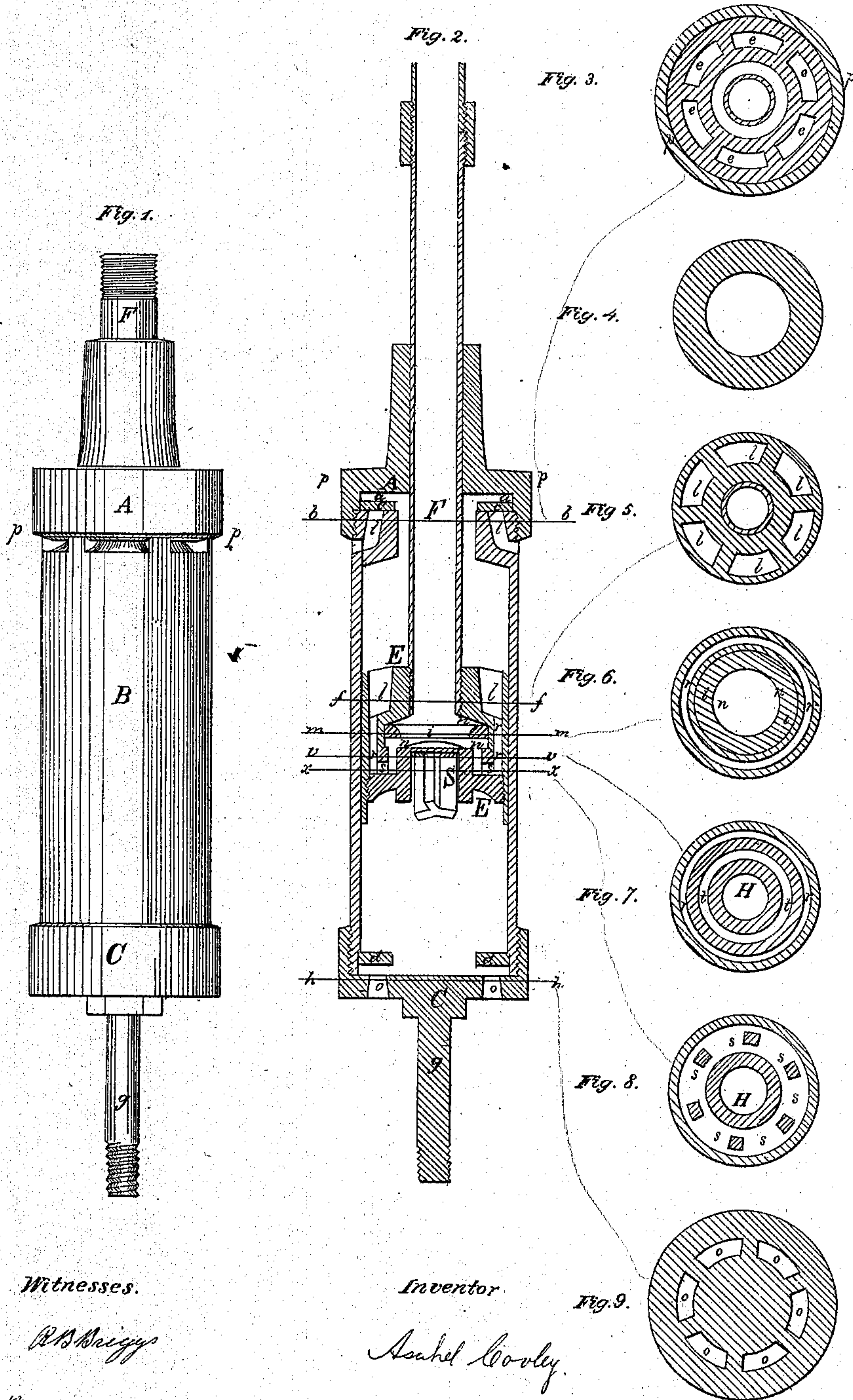


*A. Cooley,*  
*Submerged Pump,*

*Nº 35,508,*

*Patented June 10, 1862.*



*Witnesses.*

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# UNITED STATES PATENT OFFICE.

ASAHEL COOLEY, OF CHICAGO, ILLINOIS.

## IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. 35,508, dated June 10, 1862.

*To all whom it may concern:*

Be it known that I, ASAHEL COOLEY, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improved Double-Acting Force Pump, the construction and operation of which I hereby fully and accurately describe, the accompanying drawings making a part of this specification.

Figure 1 is a longitudinal elevation. Fig. 2 is a longitudinal section. Fig. 3 is a transverse section in the line *b b*. Fig. 4 is a face view of the valves *c c* and *d d*. Fig. 5 is a transverse section of the piston in the line *f f*. Fig. 6 is a transverse section of the piston in the line *m m*. Fig. 7 is a transverse section of the piston in the line *v v*. Fig. 8 is a transverse section of the piston in the line *x x*. Fig. 9 is a transverse section of the bottom piece, C, in the line *h h*.

The top piece, A, is attached to the cylinder B, forming an annular valve chamber, *a a*, which communicates with a series of induction-passages, *e e e e e*, Fig. 3, over which is a ring-valve, *c c*, Fig. 4, or its mechanical equivalent. The bottom piece, C, is arranged with a series of induction-passages, *o o o o o*, Fig. 9, over which is a ring-valve, *d d*, Fig. 4. It has also a central bolt, *g*, for the purpose of attaching the pump to any suitable fastening in the bottom of the well.

The piston E E is arranged with a series of passages, *l l l l l*, Fig. 5, communicating with an annular passage, *r r*, Figs. 2, 6, and 7, which also communicates by the passages *s s s s*, Figs. 2 and 8, and an annular passage, *t t*, Figs. 2 and 7, with a circular valve-chamber, *n n*, Figs. 2 and 6. Within the valve-chamber *n n* and over the annular passage *t t* is a ring-valve, *i*, Figs. 2 and 6, or its mechanical equivalent.

H, Figs. 7 and 8, is a central eduction-port, which is closed by the valve S or its equivalent.

Attached to the piston and communicating with the valve-chamber *n n* is a hollow piston-rod, F, which passes loosely through the top piece, A, and is extended to the top of the well and attached to a lever or any other suitable device for working the pump.

The relative dimensions shown in the accompanying drawings adapt the pump to the capacity of bored or drilled wells, the diameters of which are generally small. For ordinary purposes it may be simplified by increasing the diameter at *p p p p*, so that the

passages *e e e e e* may be made straight and vertical, in which case the bore of the cylinder may be extended to the valve-chamber *a a*.

*Operation.*—When the piston is moved upward, the water flows through the passages *o o o o o* and the ring-valve *d d*, and fills the cylinder below the position, after which the passages *o o o o o* are closed by the valve *d d*. When the movement of the piston is reversed, this water lifts valve S and passes through the port H and valve-chamber *n n*, and is conducted through the piston-rod F to the top of the well. As the piston moves downward, the water flows through the passages *l l l l l*, lifts valve *c c*, and fills the cylinder above the piston, after which the passages *l l l l l* are closed by the valve *c c*, and as the movement of the piston is again reversed the water flows through the connected passages *l l*, *r r*, *s s*, *t t*, lifts the ring-valve *i*, passes through the same, and is discharged through the piston-rod F, while the cylinder is again filled below the piston, as before described.

The pump may be worked slowly or rapidly without jar or backflow of water, as the ports are all closed promptly by the weight of the corresponding valves as the movement of the piston is reversed.

I claim—

1. The manner described of filling the cylinder above the piston, to wit: by the employment of the induction-ring valve *c c*, surrounding the bore of the cylinder at the top of the same, the ports *e e e e e* of which being so arranged as to direct the water underneath said valve *c c* or be closed by the falling of the same, substantially as described.

2. The eduction-passages *l r s t* or their equivalent, so constructed and arranged as to receive the water above the piston and convey it underneath and through the eduction-valve *i*, substantially as described.

3. The tubular piston-rod F and eduction-valves *i* and S, arranged and operated substantially as described.

4. The parts *g*, C, and *d d*, arranged substantially as described, when combined with a pump-cylinder, and a tubular piston-rod, F, for the purposes set forth.

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Witnesses:

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