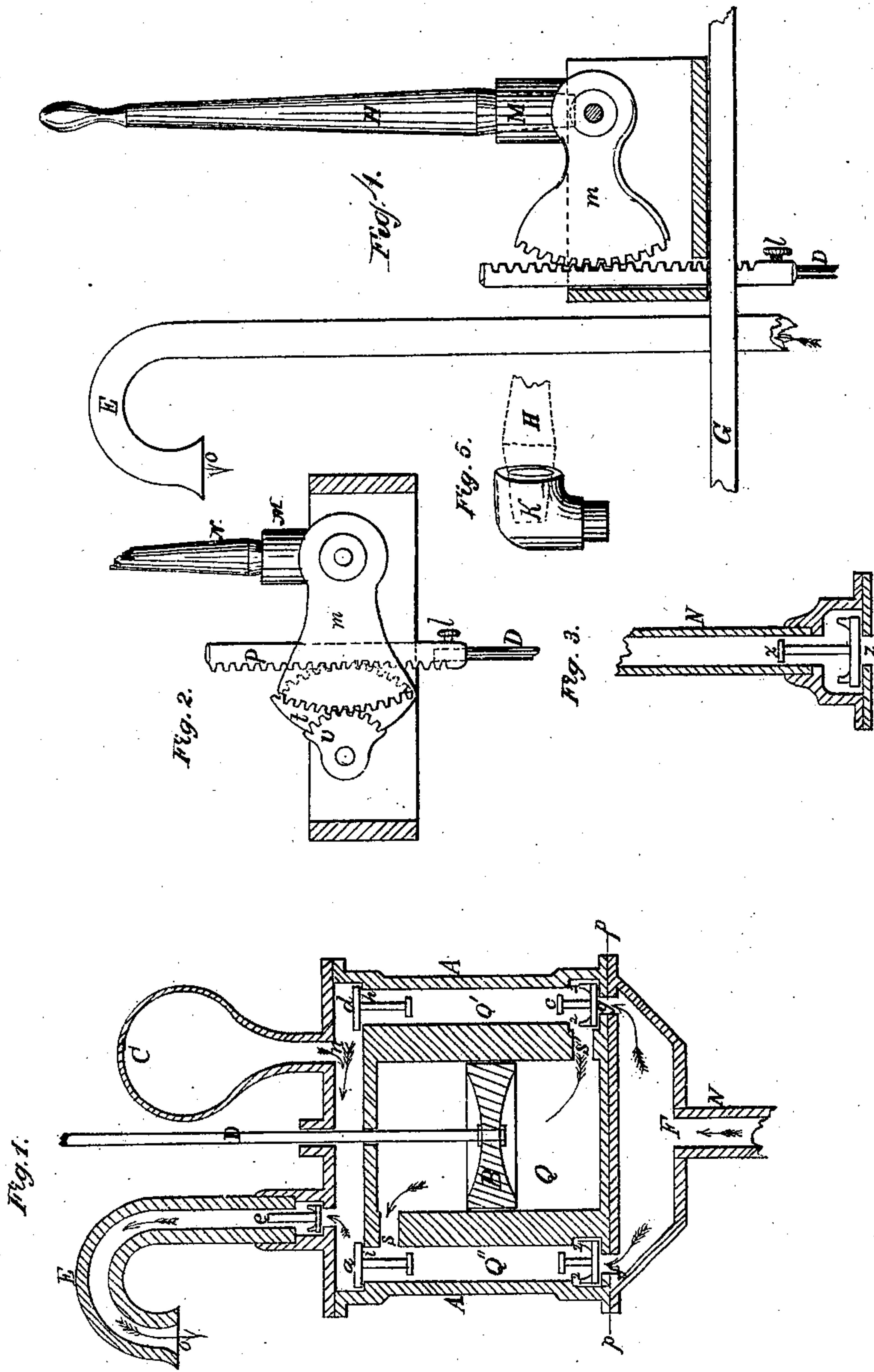


B. F. Brown,

Submerged Pump.

N^o 85,063.

Patented Dec. 22, 1868.



Witnesses
Roll Carpenter
A. J. B. Turnworth

Inventor
Benjamin F. Brown by his atty.
Carroll D. Wright

United States Patent Office.

BENJAMIN F. BROWN, OF WOBURN, MASSACHUSETTS.

Letters Patent No. 85,063, dated December 22, 1868.

IMPROVEMENT IN SUBMERGED PUMPS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, BENJAMIN F. BROWN, of Woburn, in the county of Middlesex, and State of Massachusetts, have invented certain Improvements in Submerged Pumps; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing, making part of this specification.

Figure 1 is a sectional perspective view of the body of the pump, showing piston, cylinders, valves, air-chamber, and eduction-pipe.

Figure 2 shows one method of working the piston-rod.

Figure 3 shows an attachment, which may be applied to my pump, when it is desired to use the same without being submerged.

Figure 4 shows the ordinary method I employ to work the piston.

Figure 5 shows the manner in which I adjust the brake or handle, when it is desired to have the same worked horizontally instead of perpendicularly.

The object of my invention is to produce at once a double-action submerged force-pump, which shall be durable, non-freezing, and not liable to get out of order, while there is no packing to be used in its construction.

In the drawings, A is the frame-work or body of the pump.

Q is a cylinder, in which plays the solid piston B.

Q' and Q'' are cylinders for the passage of water or other liquid to be pumped.

E is the eduction-pipe.

C, an air-chamber, which may be used or not.

D is the piston-rod, which, in operating, is attached to the cogged holder P.

a d b c are valves, used as shown, and the peculiar shape given them is necessary to the successful or satisfactory operation of the pump.

When my pump is used as a submerged pump, the part below the line p p is removed.

H is a lever or brake, to which is applied the motive-power for working the pump.

This lever is fixed into socket M, belonging to arm m, which has a cogged end, as shown.

These cogs work upon cogs on the holder P directly, or, when greater speed is required, upon fulcrum V, with cogged shoulder t, and shoulder t works upon holder P.

When it is desirable to have the brake H horizontal, I use the knee-socket K in socket M.

The piston-rod D is fastened to holder P by set-screw or pin l.

In the construction of my pump, there is no necessity for nice packing of the piston or water-tight valves; in fact, I use no packing anywhere upon the pump, but the whole is made of any suitable metal, giving an ordinary amount of care to the finish of the castings.

The operation of my pump, so far as the pump itself is concerned, does not vary materially from known double-acting pumps, but in the general operation I claim advantage over other pumps.

When in operation, my pump is entirely submerged in the liquid to be pumped, with the part below line p p removed. The liquid runs in at aperture F and g, when the piston B is raised, causing a vacuum in the cylinder Q, below the piston-head. The liquid forces up valve c, and fills cylinder Q, as well as cylinder Q', through aperture g and port S', for the pressure of the liquid, to fill the vacuum below piston B, raises valve c, and, as this valve is constructed with projections 2 2, the liquid is allowed to pass between 2 2, and fill cylinder Q', as well as Q.

Now, when the piston B is forced down, it forces the liquid below it, through the port S', into and up the cylinder Q', closing, of course, valve c, while the downward movement of piston B creates a vacuum over it, and the liquid flows in at f to fill the vacuum thus caused, passing through port S, but not opening valve a, for the pressure of water over it keeps valve a down until the movement of piston B is reversed.

The downward movement of the piston opens valve d by the pressure given the liquid, and the upward movement of piston opens valve a, closing valve b.

These movements continued, fill the space above valves a and d, while the pressure of liquid, continually seeking an outlet, together with the pressure from air-chamber C, closes alternately valves a and d, as the piston B is moved up and down, when the liquid is forced to flow up through eduction-pipe E, and out at o. (The valve E is superfluous, and performs no action in the operation of my pump.)

I thus secure a constant flow from E, while I do not raise the pipe at every stroke of the lever.

The valve a is so constructed as to allow it to open freely without closing port S.

When it is desired to use my pump as an ordinary pump, I can do so by attaching the arrangement shown in fig. 3 to aperture F.

This attachment is submerged, the liquid flowing through z into pipe N. When a vacuum is created in the cylinder Q by the movement of the piston B, the pressure on the surface of the liquid forces it up pipe N, so that, when the vacuum is reduced, the weight of water in the pipe N closes valve z, until the next vacuum is produced, and the liquid forced into cylinder Q', when the pipe N fills again through z.

I am aware of the existence of double-acting force-pumps, and of double-acting submerged pumps, and I do not claim having invented any new principle in the operation of pumps; but a new arrangement of known principles, by which I can more conveniently and easily produce known results, and I am not aware of any pump arranged and operated in like manner to my invention.

Having thus fully described my invention,
What I claim as my improvement, and desire to secure by Letters Patent, is—

1. The valves *a b c d*, constructed as described, in combination with openings *F* and *g*, ports *S* and *S'*, cylinders *Q*, *Q'*, and *Q''*, piston *B*, piston-rod *D*, air-chamber *C*, eduction-pipe *E*, cog-faced arm *m*, cogged holder *P*, sockets *K* and *M*, and lever *H*, all arranged and operating, relatively to each other, substantially as and for the purpose herein described.

The above invention was made by me, January 31, 1868.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

BENJAMIN F. BROWN.

Witnesses:

CARROLL D. WRIGHT,
JANE E. WRIGHT.