2 Sheets--Sheet 1.

T. B. GOULDING.

Improvement in Pumps.

No. 114,668. Patented May 9, 1871.

Fig. 2.

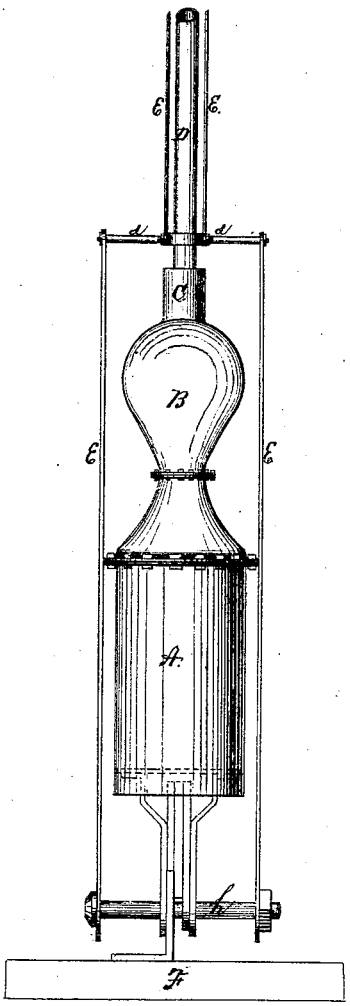
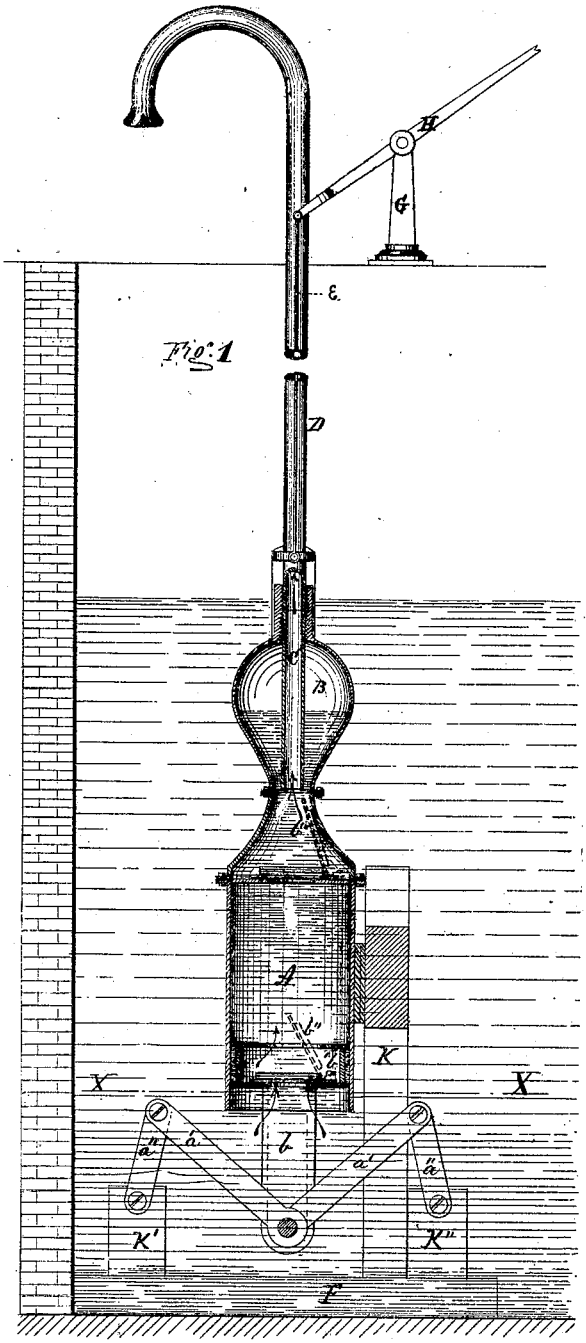


Fig. 1



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his atty.

2 Sheets--Sheet 2.

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Fig. 3.

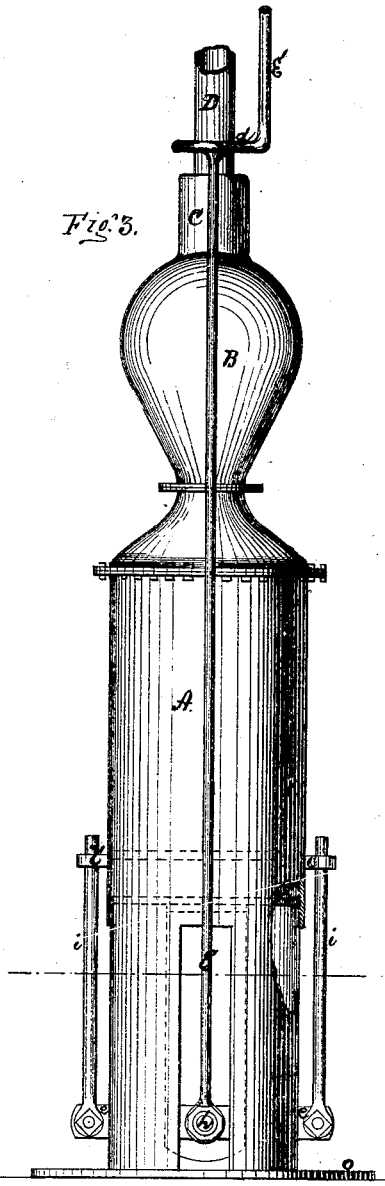
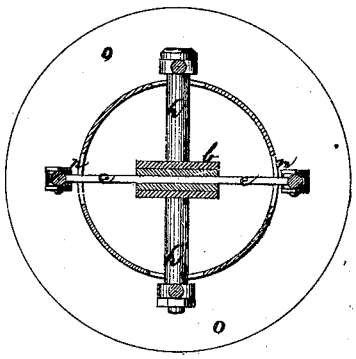


Fig. 4.



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United States Patent Office.

THOMAS B. GOULDING, OF COLUMBUS, GEORGIA.

Letters Patent No. 114,668, dated May 9, 1871.

IMPROVEMENT IN 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, THOMAS B. GOULDING, of the city of Columbus, county of Muscogee and State of Georgia, have invented a new and useful Improvement in Pumps; and I do hereby declare the following to be a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing making a part and parcel of this my specification.

The figures on sheet 2 show the form and construction of the same in way preferred by me; while

Figures 1 and 2 of sheet 1 show modifications in the construction of some of the parts of the pump; but in all the figures and in the operation of the pump, constructed in either of the ways shown, the same principle is involved.

The nature and object of my invention is to construct a pump in such a manner as to have imparted to it the greatest strength and cheapness, and to make the same as simple as possible and possessing great power.

Its several novel features consist in construction of a piston, to which a valve is attached, operated by means of rods attached to a cross-bar, the latter of which is secured to a projecting arm that is attached to the piston; and also in combining with such pump an air-chamber upon the upper portion thereof, into which air-chamber is inserted a hollow tube or rod, through which the water is forced to the top of the well; also, in the construction of guides on the external portion of the pump to admit rods that are attached to the piston cross-bar in any convenient manner, to prevent any vibration of the piston when operated, and preserve a certain vertical movement of the piston; also, in the construction and arrangement of a fixed valve in the upper portion of the pump, which valve opens into the air-chamber above it, so that the said pump contains within it a movable valve upon the piston and a fixed valve at the opposite and upper end of the pump, and by their construction, and the submerging of the pump in the water of the well, doing away with the necessity of any packing whatever other than that caused by the water itself.

To enable others skilled in the art to make and use my said invention, I will proceed to describe the construction and operation of the same.

Fig. 1, sheet 1, represents the pump, that may be partially or wholly submerged in the water of the well at its bottom.

In this figure the pump is secured to a frame-work, K K′ K″.

A represents in each figure of the drawing the barrel of the pump, and

B an air-chamber immediately above it and connected with it by flanges and screws, or in any suitable manner.

Within the barrel of the pump I construct a piston of proper size, and filling the inner diameter of the same, as seen at *b′*.

A projection, *b*, is formed upon the lower end of said piston, containing a slot that will admit the levers *a′*, held within the same by means of a pin or bolt.

To said levers are attached other levers, *a″ a‴*, the latter being pivoted to the former, as shown in the drawing, and also to the frame-work K′ K″.

A cross-bolt, *h*, passes through the projection *b*, to which are attached the rods E E, fig. 2, which rods extend upward above the air-chamber, and are connected there by means of a rod, *d*, upon which a yoke is formed surrounding the water-pipe or conductor D.

Said rods are operated by means of the lever H and stand or pedestal G, as seen in fig. 1.

The movement of these rods upward or downward is steadied by means of the yoke surrounding the water-pipe D.

C is a tube inserted in the top of the air-chamber, and projects below it to such distance as not to come into contact with the upper stationary valve *b‴*, as seen in fig. 1.

The lower valve *b″* is adjusted to the movable piston *b′* in manner shown, and when the pump is in operation and the water forced above the upper valve of the pump, the air in the chamber aids in expelling the water through the pipe D, which said pipe is screwed into or in any convenient way attached to the tube C. The water-line is intended to be represented at *x x*, fig. 1, but the pump can be operated if entirely submerged.

Figure 3 shows a different form of construction and arrangement of the operative parts of this pump, the principle, however, being the same in each.

The rods E E pass down on either side of the pump, and are connected by means of the rod *h*, that passes through the projection *b* attached to the cross-head; and at right angles to said rod *h* is a bar, *e*, passing through the same projection *b*, to which are attached the rods *i i* that pass upward through flanges formed upon the body of the pump and through slots *n n* cut in the same.

The pump rests upon and is secured to the circular flange *o o* that may rest upon the bottom of the well, or attached in any suitable manner to a wooden foundation placed within the well, at its bottom, below the pump.

The rods E E, fig. 3, project upward, and a yoke is formed thereon surrounding the pipe D above the tube C, and there uniting in one rod, E′, that projects above the well, and is operated by means of a lever or other suitable device, similar to that shown in fig. 1.

By means of the latter-described arrangement duplicated levers are avoided and the vertical movement of the piston assured. This pump can be made to occupy a very small space, and possesses power sufficient to force large quantities of water to the surface of the ground and to a very considerable height above it. A well of the diameter of from four to six inches would receive a pump of the kind described. It is simple in its construction and attended with little expense, possesses great strength and power, and the several parts easily duplicated when worn or injured.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination and arrangement of the rod E′ with the rods E E, rod *h*, and piston *b′*, in the manner and for the purpose herein described.

2. The piston *b′*, having its vertical movement controlled and regulated by means of the cross-bar *e*, rods *i i*, and flanges *i′ i′*, in the manner and for the purpose herein described.

3. In combination with the foregoing elements, the movable piston-valve *b″* and fixed valve *b‴*, for the purposes herein set forth.

4. The construction and operation of a pump, in the manner and for the purpose herein described.

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