2 Sheets—Sheet 1.

W. M. GIBSON.

Lift-Pumps.

No. 197,354. Patented Nov. 20, 1877.

Fig. 1.

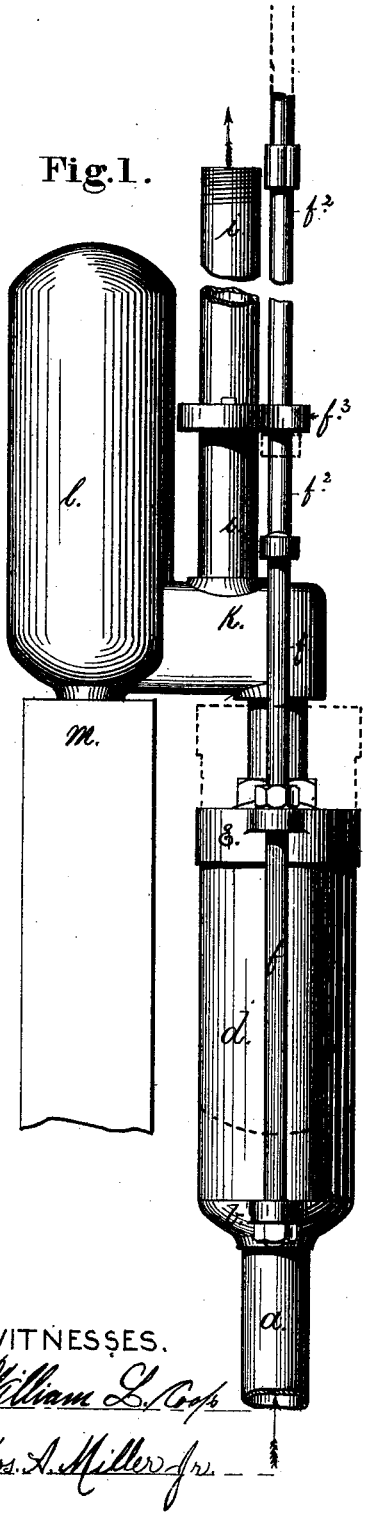
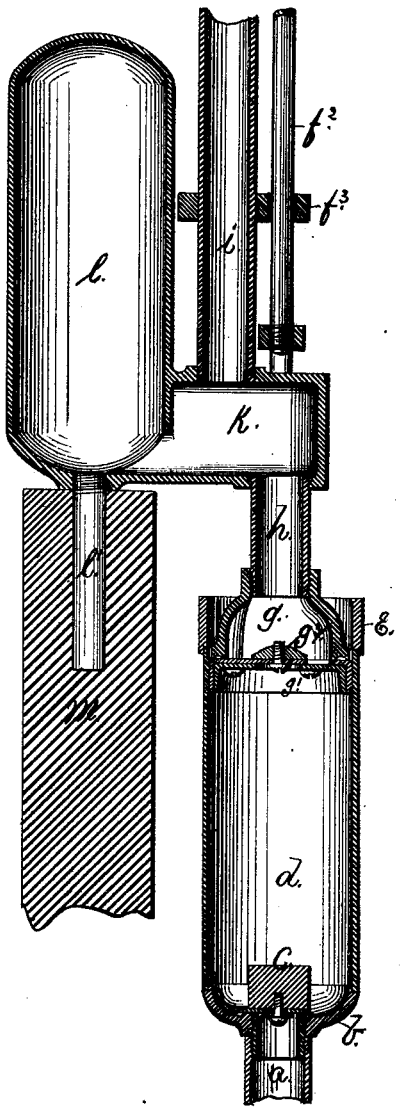


Fig. 2.



WITNESSES.

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2 Sheets—Sheet 2.

W. M. GIBSON.

Lift-Pumps.

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Fig. 3.

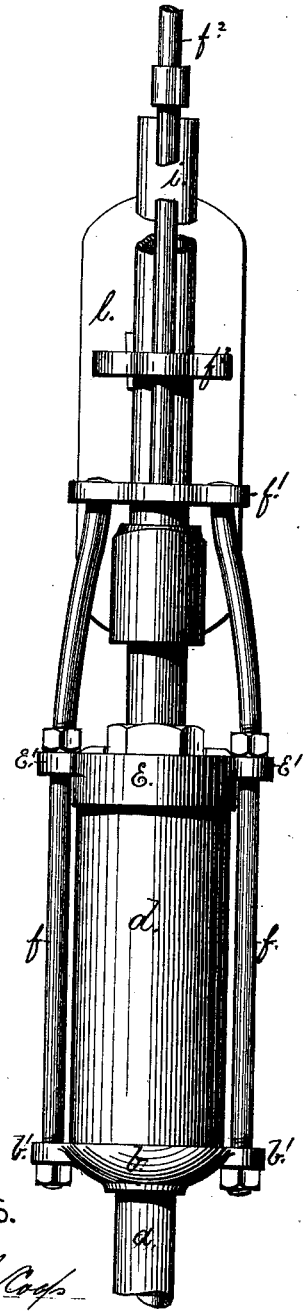


Fig. 4.

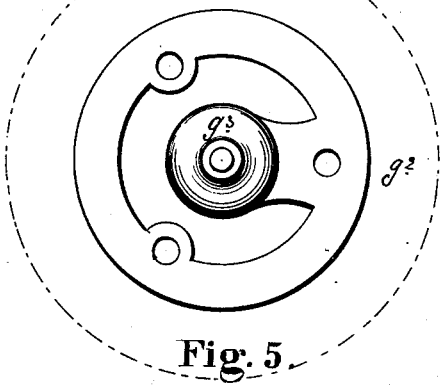


Fig. 5.

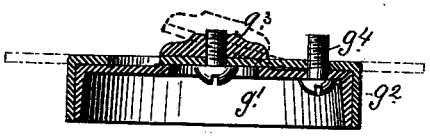
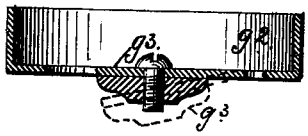


Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM M. GIBSON, OF PHENIX, RHODE ISLAND.

IMPROVEMENT IN LIFT-PUMPS.

Specification forming part of Letters Patent No. **197,354**, dated November 20, 1877; application filed October 6, 1877.

To all whom it may concern:

Be it known that I, WILLIAM M. GIBSON, of Phenix, in the county of Kent and State of Rhode Island, have invented certain new and useful Improvements in Pumps; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

Figure 1 is a side view of my improved pump. Fig. 2 is a vertical section of the same. Fig. 3 is an end view of the pump; Fig. 4, a plan view of the pump-valve. Fig. 5 is a sectional view of the valve, and Fig. 6 is a sectional view of the leather cup and valve.

The invention has reference to the kind of pumps known as "deep-well" pumps, in which the pump proper is placed within the well, and either at such distance above the water as will insure easy suction, or below the water-level, and the water forced to the surface.

It consists, first, in the peculiar arrangement of the inlet and outlet pipes connected with the air-chamber, by which the actuating-rod is placed so as to be on a line with the axis of the pump-cylinder.

It also consists in the peculiar and novel arrangement of the stirrup and the pump-cylinder, and the novel construction of the bucket-valve and valve-cup, as will be more fully described hereinafter, and pointed out in the claims.

In the drawings, *a* is the suction-pipe, which may be provided at its lower end with a strainer. When, however, the pump is used as a submerged pump, in place of the suction-pipe *a* the strainer is placed on the cylinder end *b*, within which the foot-valve *c* is secured. *d* represents the pump-cylinder, of copper, brass, or other metal, secured between the cylinder ends *b* and *e*, the whole being held together by rods passing through the ears b' b' and E′ E′, and securely held by suitable screw-nuts. The rods *f f* may preferably form the stirrup, and unite with the pump-rod f^2 at f^1, either by securing the ends to a union-piece, as shown, or otherwise uniting the same.

g is a stationary bucket-valve, provided with a check-valve, and secured by a cup-shaped casting to the end of the pipe *h*. The construction of this valve-bucket is peculiar, and is shown enlarged in Figs. 4, 5, and 6. The leather cup forming the packing of the valve on the sides of the pump-cylinder is made in one piece with the check-valve, and is secured to the valve-cup by three screws. g^1 is the metal bucket; g^2, the leather cup, forming, also, the check-valve g^3, the whole being secured to the valve-cup g^1 by three screws, g^4, forming a cheap and simple bucket-valve for a pump which can be used for either a simple lift-pump or for lift and force pumps. The leather cup can be readily secured by the screws g^4, and as readily removed or replaced.

The air-chamber *l*, cast in one piece with the chamber K, has the receiving-pipe *h* and the discharge-pipe *i* secured to it in such a manner that the two pipes will be offset sufficiently to allow the actuating-rod f^2 to reciprocate with the pump-cylinder in a straight line with the axis of the cylinder, thus preventing all binding and straining on the piston or bucket-valve, insuring uniform wear and ease in its operation. f^3 is a guide-collar, through which the actuating pump-rod f^2 passes, and is secured to the delivery-pipe *i* by means of one or more keys. l' is a pin, which may be provided with a screw and nut at its lower end, and is used to secure the pump in its proper position in the well. *m* represents a piece of timber, on which the pump rests.

The operation of the pump, whether submerged or placed above the water-level, is as follows: The pump-cylinder being raised by the pump-rod f^2, the water is forced through the check-valve g^3 and through the pipe *h* into the delivery-pipe *i*, from the upper end of which it is discharged. When the pump-cylinder commences to descend, the check g^3 closes, a partial vacuum is created in the pump-cylinder, and the atmospheric pressure forces the water into the cylinder, to be discharged on the upward stroke of the same.

The pump-cylinder can be readily taken apart, and all parts of the pump examined and repaired. It can be cheaply built, and used in wells of any depth, either as a submerged or an ordinary pump. As the strains are on the axial line of the cylinder and bucket-valve, it works evenly and with least friction.

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

1. The combination, with the bucket-valve of a pump, of the leather cup g^2, arranged to form the packing of the bucket and the check-valve in one piece, substantially as and for the purpose described.

2. The combination, with the bucket g^1, of the leather cup g^2, forming the packing and the check-valve in one piece, and the screws g^4, arranged to secure the leather, substantially as and for the purpose described.

3. The combination, with the air-chamber *l* and chamber *k*, of the pipes *h* and *i*, arranged to form an offset, so that the actuating-rod can be operated on a line with the axis of the pump-cylinder, as and for the purpose described.

4. The combination, with a reciprocating pump-cylinder, of the pipe *h*, chamber *k*, and pipe *i*, and the rods *f f* secured to the cylinder, the rod *f*, and guide f^3, the whole arranged and operating substantially as and for the purpose described.

5. The combination, with the tube *d*, of the end E, provided with the ears or lugs E′ E′, the end *b*, provided with the ears *b′ b′*, and the rods *f f*, arranged to form the reciprocating pump-chamber, substantially as and for the purpose described.

6. The combination, with a pump arranged substantially as described, of the pin *l′*, arranged to support and secure the pump, as and for the purpose described.

WM. M. GIBSON.

Witnesses:
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