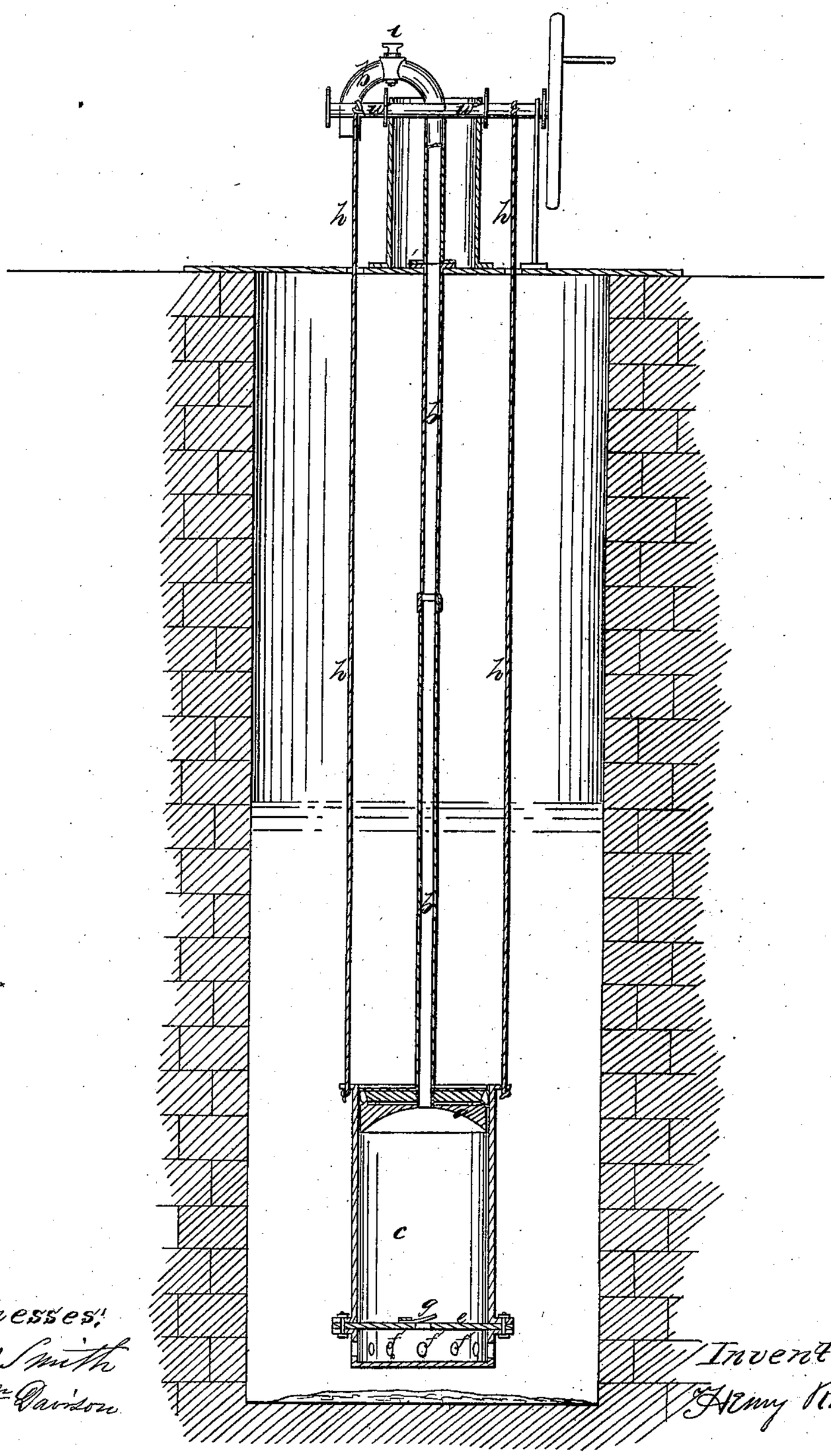
H. Rogers,

Pump Lift,

No. 12,326. Patented Jan. 30, 1855.



Witnesses:
Wm. M. Smith
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UNITED STATES PATENT OFFICE.

HENRY ROGERS, OF FERRISBURGH, VERMONT.

FORCE-PUMP.

Specification of Letters Patent No. 12,326, dated January 30, 1855.

To all whom it may concern:

Be it known that I, HENRY ROGERS, of Ferrisburgh, in the county of Addison and State of Vermont, have invented a certain new and useful Improvement in Lift and Force Pumps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, which forms a part of this specification, and to letters of reference marked thereon, and which represents a vertical section of my improved pump applied to the lifting or forcing of water from a well or cistern.

In the pump shown in the drawing, the plunger or piston (*a*) is stationary, and is firmly secured to the bottom or lower end of a vertical central delivery pipe (*b*), which is open top and bottom, forming a clear passage through the plunger. The piston (*a*) fits freely but water tight within a bucket, barrel or cylinder (*c*) closed at its bottom, but having perforations or inlets (*f*) in its sides near the bottom, for the admission of the water; this arrangement of the inlets is preferred, as offering more security against the admission of mud or dirt, from the bottom of the well into the cylinder; a horizontal division plate (or inner bottom) (*e*), is situated within the cylinder (*c*) near its bottom, but above that portion of it containing the inlet apertures (*f*), which said portion may be a separate chamber or box, secured by bolts or otherwise to the main body of the cylinder; the division plate (*e*) has a foot or ingress valve (*g*) opening upward or inwardly. The bucket or cylinder (*c*) thus constructed, and having the piston or plunger (*a*) within it, at or near its upper end, is immersed in the water in the well, and may be situated at any distance below its level or surface, as represented in the drawing.

To pump or raise the water from the well, the cylinder (*c*) is lifted, by means of chains, rods, or ropes (*h*) attached to the cylinder, and operated by a windlass (*w*) at the top of the well, or by any other suitable appliances.

The central delivery pipe, protrudes through the top of the well, and may be bent downward at its top, for the convenience of delivering the water into buckets, &c., as the case may be; this pipe is provided with a stop cock (*i*) at or near its discharge aperture, which is opened or closed at pleasure by hand, its main object is to retain the water after the one lift of the pump, in the central delivery pipe, and prevent it from running back into the well during the descent of the bucket, preparatory to another lift, and this is accomplished by closing the said stop cock at the termination of the one lift, to exclude the atmosphere and thus retain the water in the delivery pipe; immediately after the bucket or cylinder has descended to its lowest point, and filled with water through the ingress apertures (*f*), the foot valve (*g*) closes, when the stop cock may be again opened, the said stop cock being always open during the lift or rise of the cylinder; but as such stop cock or valve only serves to economize or save the quantity of water contained in the delivery pipe after the one lift, and avoid loss of time and labor in again filling the pipe, its action will not be considered in the after description, as the pump may be operated without it, and with only the one valve (*g*) near the bottom of the cylinder; for convenience sake therefore, I will suppose the stop cock at the top, to be dispensed with, and the delivery pipe always to form an open communication, with the water in the cylinder at one end, and the atmosphere outside of the well at the other.

The bucket or cylinder (*c*) is allowed to descend by its own weight, to or near the bottom of the well, during which operation the foot valve (*g*) opens, and admits water entering through the side perforations (*f*) into the body of the bucket, and into any portion of the delivery pipe, that may be immersed in the water in the well, and when the bucket is down, the water in it and the delivery pipe, stands at the same level as that of the surrounding water in the well.

Upon turning the windlass (*w*) to raise the bucket, the foot valve (*g*) closes, and the bottom of the bucket then acts as a plunger, to force the water contained in the bucket up the delivery pipe, and out (by the continued ascent of the bucket) at the top of the pipe, and thus the water is drawn or forced from the well, without the aid of vacuum, whereby greater certainty of action is obtained; as leakage of the delivery pipe, plunger, or barrel, will but immaterially affect the action of the pump, as compared with a similar amount of leakage if a vacuum were required, and the lift of water from the well, may be from any greater depths, to any greater heights, than that

which the atmosphere is known to support a column of water at; the lift of the water, not being dependent upon atmospheric pressure, but being governed entirely by mechanical force, and dependent only upon the relative areas and capacities of the bucket or cylinder, and delivery pipe; so that by this arrangement, by employing a bucket of large area, in proportion to the area of the delivery pipe, a column of water may be forced with great violence, to a much greater height than thirty two feet, and the loss of time usually consequent upon exhausting air from a suction pipe is avoided, and the discharge of water from the pump, produced almost instantaneously, upon commencing to lift the bucket. All liability of water freezing in the discharge pipe, is also avoided, as upon descent of the bucket, the water contained in the discharge pipe, runs back into the bucket, and will never exceed the height of the surrounding water in the well, when the pump is at rest.

The bucket in descending by its own weight, insures this freedom of the delivery pipe from water, which is not, as is usually the case in other pumps, dependent upon the attention of the operator; whereby a more perfect certainty of supply, will be obtained in the winter season, and the delivery pipe be secured from bursting by water freezing in it, above the level of the water in the well; and at or below that level, the temperature of the inclosed or confined air, renders it seldom if ever liable to freeze, if the water in the well stands only a few feet below the surface of the ground. Thus the pump automatically clears itself (without possibility of failure) of lift water, which in other pumps, owing to their principle of action, or the neglect of the operator to clear the delivery pipe, is so often productive of inconvenience or injury.

To adapt this pump to other purposes, than that of lifting from a well or cistern, various mechanical modifications, which are not necessary to specify here in detail, may be requisite; or in the described application, or any other of it various modifications may be made, as for instance the barrel or cylinder may be stationary, and be provided with a delivery pipe, and the piston made solid and movable to operate in like manner to that already described; or in the arrangement as illustrated and described, the plunger instead of being of a piston shape, may be of long cylindrical form, to serve as a guide to the bucket in ascending and descending; and where a continuous action is required, two such pumps working opposite or alternate strokes may be employed, &c.

What I claim and desire to secure by Letters Patent is,

The combination of the suspended valve bucket with the stationary hollow plunger or of the suspended hollow plunger with the stationary valve bucket, when so constructed, arranged and operated as to serve automatically to clear the delivery pipe of water, as and for the purposes herein set forth.

In testimony whereof, I have hereunto subscribed my name this third day of May 1854.

HENRY ROGERS.

Witnesses:
BENJN. DAVISON,
WM. M. SMITH.