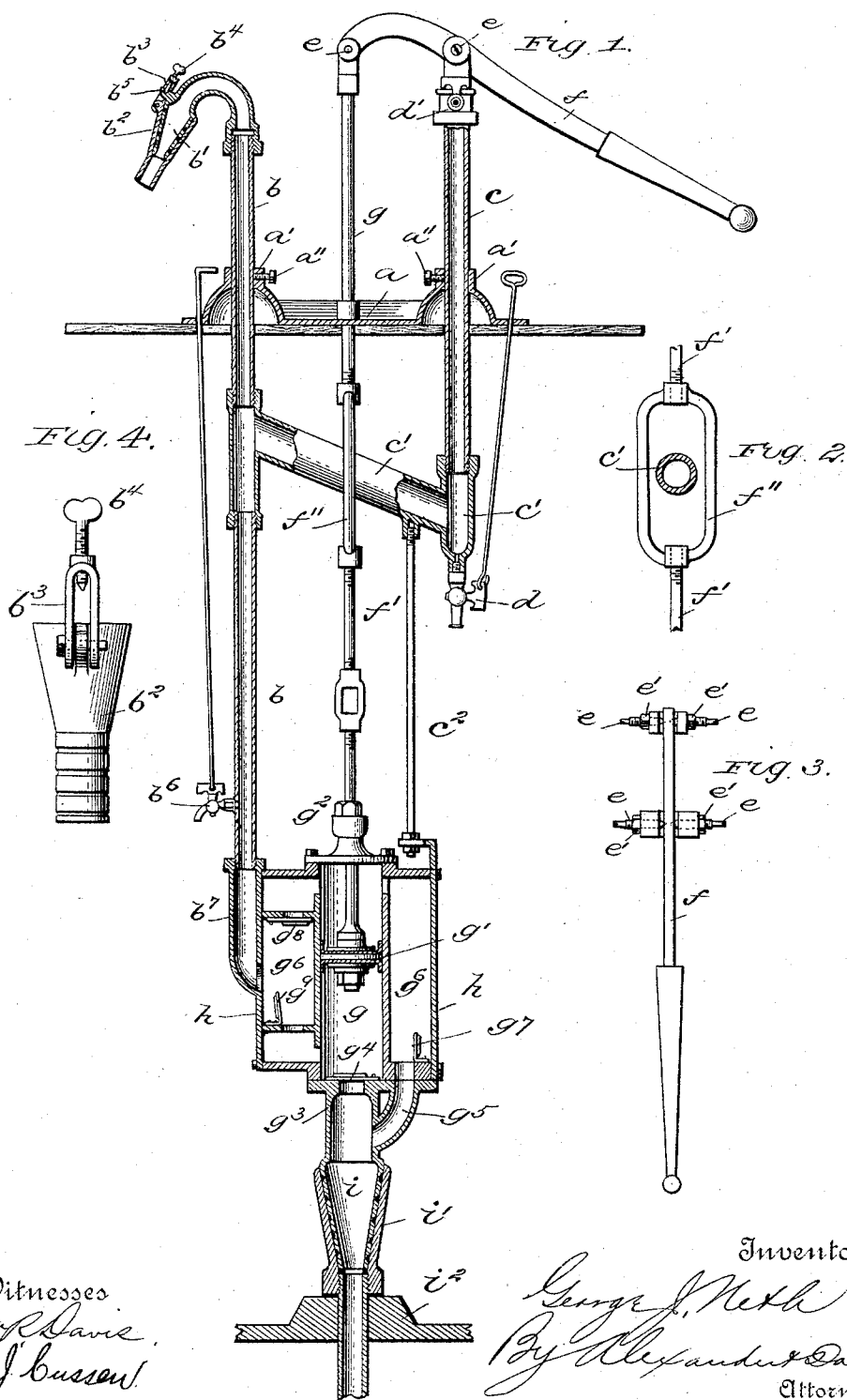


G. J. NETH.
DOUBLE ACTING PUMP.

Patented Sept. 13, 1892.



UNITED STATES PATENT OFFICE.

GEORGE J. NETH, OF DAYTON, OHIO, ASSIGNOR OF ONE-HALF TO JOSEPH GRESS, OF SAME PLACE.

DOUBLE-ACTING PUMP.

SPECIFICATION forming part of Letters Patent No. 482,692, dated September 13, 1892.

Application filed October 7, 1891. Serial No. 408,029. (No model.)

To all whom it may concern:

Be it known that I, GEORGE J. NETH, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Double-Acting Pumps, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figure 1 represents a vertical sectional view, partly in side elevation, of my improved pump; Figs. 2, 3, and 4, detail views hereinafter described.

This invention relates to double-acting force-pumps wherein both the upward and downward strokes of the plunger are utilized to force the water up through the supply-pipe, thereby obtaining a continuous stream during the operation of the pumps; and its objects and advantages fully appear in the course of the specification.

Referring to the drawings, *a* designates the base-plate, suitably supported upon the well-platform and provided with upwardly-extending tubular extensions *a'* *a'*, in which are tapped set-screws *a''* *a''*. The supply-pipe *b* of the pump passes up through one of these extensions and is supported therein by the set-screw, and the air-chamber tube *c* passes up through the other extension and is similarly supported, this arrangement permitting vertical adjustment of said pipes. The spout on the upper end of the supply-pipe is formed tapering at its discharge end, as at *b'*, and provided on its exterior with annular grooves for the reception of suitable packing. Fitted snugly upon the conical end *b'* is a similarly-shaped conical part *b²*, which is adapted to be attached to a hose and which is securely held in place by a yoke *b³*, provided with a thumb-screw *b⁴*. The yoke is pivoted on the upper end of the part *b²* and swings up over a lug *b⁵*, formed on the spout, where it is secured by the set-screw, this screw serving to draw the part *b²* tightly upon the conical nozzle and form a water-tight joint therewith. The pipe *b* is connected to the lower end of the air-chamber *c* at a suitable point below the well-platform by an inclined tubular casting *c'* which establishes communication between the two tubes. The lower end of the air-chamber

is provided with a discharge-cock *d*, which is operated by a rod extending to the well-platform, whereby the water and sediment accumulated in the same may be discharged. Upon the upper end of the air-tube *c* is screwed a cap provided with another cock *d'* to let the air out of the air-tube whenever desired. The pump-lever *f* is pivoted between ears formed on the upper end of the air-chamber, the supporting-pivots consisting of pointed screws *e*, tapped into the ears and entering recesses in the lever, whereby wear of the parts may be readily compensated for and the friction reduced to a minimum. Lock-nuts *e'* are screwed on these screws and bear against the supporting-ears, whereby the screws are prevented from prematurely loosening. The pump-rod *f'* is pivotally secured to the shorter arm of the lever by means of similar screws and lock-nuts for similar purposes. The pump-rod passes down through an opening in the base-plate, between the pipes *b* *c*, and has inserted in it a loop or link *f''*, which embraces the inclined connecting-tube *c'*. The pump-rod is provided at its lower end with a piston *g'*, of any desired construction, which works in the cylinder *g*, the rod passing through a stuffing-box in the upper head *g²* of the cylinder. The lower end of the cylinder is closed by a head *g³*, which is provided with an inwardly-opening valve *g⁴*. The two longitudinal valve-chambers *g⁵* *g⁶* are formed integrally with the cylinder, upon opposite sides of the same, and are closed by removable plates *h*, whereby ready access may be had to them. The right-hand valve-chamber is provided with an inwardly-opening valve *g⁷* over an opening in its lower end and has its upper end in communication with the upper end of the cylinder. The other valve-chamber has both its ends in communication with the cylinder and is provided with inwardly-opening valves *g⁸* *g⁹*, secured over openings in suitable horizontal partitions formed integrally with the left-hand plate *h* and communicating at its lower end with the interior of the adjacent chamber is a vertical tube *b⁷*, into whose upper end is screwed the water-pipe *b*. The lower head *g³* of the cylinder has formed integrally with it a depending tube, which

communicates with the valve-opening in the lower end of the right valve-chamber by a branch passage g^3 and which has its lower open end formed into a downwardly-tapering portion i . This conical part i rests snugly in a conical socket i' , secured upon the upper end of the stationary suction-pipe, a watertight joint being formed between the cone and its socket by annular packing-strips let into grooves on the exterior of the cone. The suction-pipe and socket may be supported in the well by any suitable means—such, for instance, as a bar i^2 .

A stop-cock b^6 may be screwed in the supply-pipe b near its lower end to discharge the water remaining therein after each operation and prevent it freezing in the pipe, this cock being operated by a rod extending to the platform.

To assist in supporting the cylinder and valve-chambers, a rod c^2 connects them to the tubular connection c' , the lower end of the rod being attached to an ear formed on the right-hand valve-chamber.

The operation of this pump is evident. Upon the upward stroke of the piston fresh water is sucked up through valve g^4 and the water above the piston is forced out through the left valve-chamber and valve g^8 and up the supply-pipe, while during the downward stroke water is sucked up through passage g^5 and valve g^7 into the right valve-chamber and the upper part of the cylinder and is forced out through valve g^9 up the supply-pipe, as is evident.

As will be observed, the pump rests in and is partially supported by the stationary conical socket on the upper end of the suction-pipe, whereby in removing the pump for repairs and cleaning it may be readily lifted out of the well without disturbing the suction-pipe or its socket. The vertical adjustability of the pump enables it to be properly adjusted so as to fit snugly in its socket on the suction-pipe, as is evident. It will be observed that in replacing the pump after cleaning or repairs it is simply necessary to let it down into the well until its lower conical end rests in the socket on the permanent suction-pipe, whereby the use of bolts and other connecting devices are entirely avoided.

It is preferred to incline the air-pipe c' upwardly from the main air-tube to the supply-pipe, inasmuch as the air-chamber is thereby rendered more effective in assisting in forcing the water out, the inclination being such that the force of the compressed air in the

chambers is applied in the direction of the flow of the outgoing water—that is, the inclination of the connection causes the compressed air to act under the outgoing column of water. This is particularly advantageous when forcing the water to long distances or to great heights.

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

1. In a pump, the combination of a base-plate, a supply-pipe supported thereon, a pump-cylinder and valve-chambers connected to the lower end of the supply-pipe, a piston and rod, an air-chamber supported by the base-plate, and a lateral tubular connection c' , connecting the supply-pipe at a point between the base-plate and pump-cylinder with the lower end of the air-chamber, said connection inclining downwardly toward the air-chamber, substantially as described.

2. In a pump, the combination, with a well-platform and a removable pump adjustably depending therefrom, said pump having its inlet-pipe formed into a hollow cone i at its lower end, of a stationary support within the well and a stationary suction-pipe supported thereon and carrying a conical cup, this cup being adapted to receive and closely fit the cone i when the pump is let down into the well, as and for the purpose described.

3. In a double-acting pump, the combination of a cylinder g , having its ends closed by removable heads g^2 and g^3 , the latter being provided with a valved opening g^4 , and a suction-pipe depending therefrom, longitudinal chambers g^6 , formed integrally on the exterior of the cylinder, one of these chambers being provided with a valve-opening at its lower end, communicating by a lateral passage g^5 with the suction-pipe, and the other one being provided with two separated horizontal partitions having each an inwardly-opening valve, side plates h h , removably bolted over the open sides of said chambers, one of these plates having formed integrally with its exterior a vertical passage b^7 , communicating at its lower end with the chamber between the valved partitions, a supply-pipe, and a piston and piston-rod, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE J. NETH.

Witnesses:

FRANK J. WILSON,
C. J. MATTENE.