

*N<sup>o</sup> 1,346.*

Patented Sept. 28, 1839.

# UNITED STATES PATENT OFFICE.

ABRAHAM T. MIXSELL, OF BELVIDERE, NEW JERSEY, ASSIGNOR TO PETER P. CAMPBELL  
AND DANL. D. CAMPBELL, OF OXFORD, NEW JERSEY.

## PUMP.

Specification of Letters Patent No. 1,346, dated September 28, 1839.

*To all whom it may concern:*

Be it known that I, ABRAHAM T. MIXSELL, of Belvidere, in the county of Warren and State of New Jersey, have made an Improvement in the Manner of Constructing a Combined Lifting and Forcing Pump; and I do hereby declare that the following is a full and exact description thereof.

In the accompanying drawings, Figure 1 is a vertical section through the two barrels, and the air vessel of my double combined lifting and forcing pump, and Fig. 2 a similar sectional side view of one of the barrels.

A and B are the two barrels and C is an air vessel placed between them and which is to operate as such when the pump is to be used for forcing the water to a height greater than that to which it is elevated by the lifting pump. The barrels A and B are made of double the length of the stroke of the pistons, with the necessary allowance for the space occupied by the buckets. From the middle part of each of the barrels there is an opening *d* and *e* into the air vessel, which opening is not furnished with valves, these not being required under my construction of the pump.

H, H, is the top plate of the air vessel, which may be secured in place by rods *i i*, Fig. 2, passing through flanches, or ears, in it, and in the lower plate J J or in any other adequate mode.

I, I, is a brake or lever carrying the piston rods, of which brake the handle R makes a part; this brake or lever has its fulcrum at *q* in standards rising from the top plate H. To the lever I are attached, by joint pins, the shackles or connecting rods *p'* and *p''* which, at their lower ends, are jointed to the solid pistons *n'* and *n''* which operate in the upper sections of the barrels A and B. From these solid pistons descend the piston rods *o'* and *o''* which carry the valved or lifting pistons *m'* and *m''* constructed as in the ordinary lifting pump and working within the lower sections of the barrels A and B below the openings *d* and *e*. At the lower ends of the cylinders are the valves *b'*, *b''*, also constructed in the ordinary way. The pipe leading down into the well or reservoir is shown at *h*; *g* is the ordinary discharge pipe or nozzle through which the water is allowed to flow when the pump is to operate on the lifting principle only; in which case

the air vessel is not brought into action, but serves merely as a chamber through which the water flows from the two barrels.

When the pump is used as a forcing pump the nozzle *g* must be closed, which may be done by means of a screw cap *h*, Fig. 2, adapted to it. A rising main *f, f'*, which may enter the chamber C opposite to the nozzle *g* or otherwise will then conduct the water to the required height the air vessel C then coming into action as such, the forcing principle being in full operation.

The action of this pump as a lifting pump does not require any description as it is precisely the same with that of the ordinary lifting pump; its operation as a forcing pump is, however, believed to be new and is dependent mainly upon the manner of combining the solid or valveless pistons therewith. As shown in Fig. 1 the pistons in the barrel A are supposed to have completed their descending and those in the barrel B their ascending stroke. The barrel B in this situation would be full of water, while the barrel A would be but half full; the descent of the piston *n'* having forced one-half of it into the air vessel C through the opening *d*; and as this piston rises in the succeeding stroke the water in the lower part of A will be carried up with it, and this will be again filled by the action of the lifting bucket *m'*; and so on, alternately, with the two barrels. By this construction of the forcing part of the pump the employment of stuffing boxes for the piston rods to slide through which are used in many forcing pumps are dispensed with and the friction and liability to be out of repair which result from their use are obviated. The cylinders being left entirely open at top the valves between the cylinders and the air vessel are also rendered unnecessary.

When the pump is not wanted as a forcing pump it may at once be made to act as a lifting pump only and there will not then be any loss of power from the lifting part, the pistons *n'* and *n''* merely acting as guides to the pistons *l'* and *l''*, their friction when properly leathered not being sensible.

What I claim as my invention in the here-described pump and desire to secure by Letters Patent, is—

The manner in which I have combined and arranged the air chamber and the solid forcing pistons *n'* and *n''* with the lifting

pistons  $m'$  and  $m^2$  so as to dispense with the valves leading into the air chamber and to admit of the ready conversion of said pump into a simple lifting or into a forcing pump  
5 as may be required substantially in the manner herein set forth.

I will here observe that the same principle or mode of construction may be applied in a

single barrel pump with an air chamber attached, although it will not be so perfect in its action as the double barreled pump. 10

ABRAHAM T. MIXSELL.

Witnesses:

W. R. SHARP,

HENRY D. SWAYZE.