(No Model.)

P. A. MYERS.

DEEP WELL PUMP.

No. 384,585. Patented June 12, 1888.

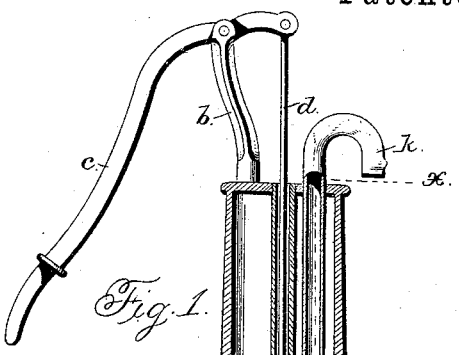
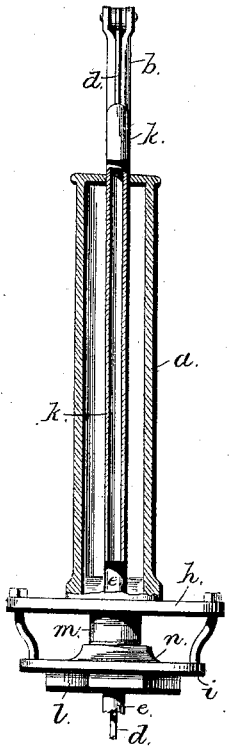
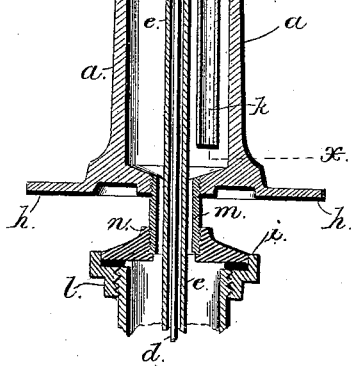


Fig. 1.

Fig. 2.





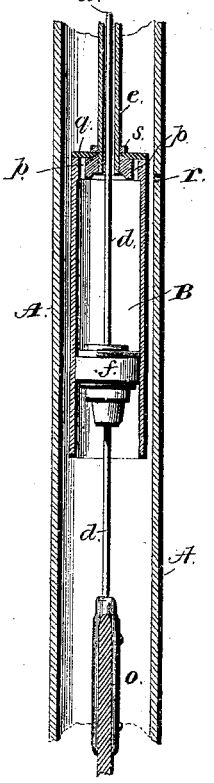
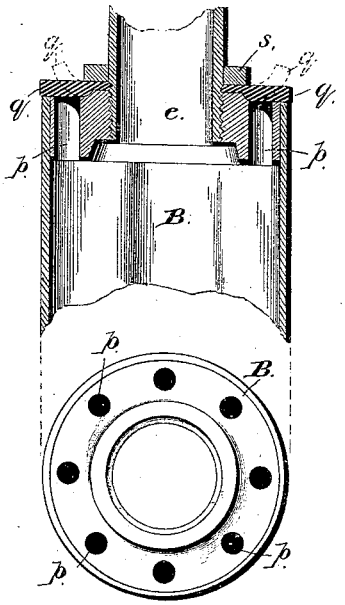


Fig. 3.



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UNITED STATES PATENT OFFICE.

PHILIP A. MYERS, OF ASHLAND, OHIO, ASSIGNOR OF ONE-HALF TO FRANCIS E. MYERS, OF SAME PLACE.

DEEP-WELL PUMP.

SPECIFICATION forming part of Letters Patent No. 384,585, dated June 12, 1888.

Application filed January 28, 1888. Serial No. 262,244. (No model.)

To all whom it may concern:

Be it known that I, PHILIP A. MYERS, of Ashland, in the county of Ashland and State of Ohio, have invented a new and useful Improvement in Deep-Well Pumps; and I do hereby declare that the following is a full, clear, and exact description of the same.

Heretofore in the construction of pumps in which a submerged or forcing cylinder has been used it has been necessary to provide an escape-vent for the accumulation of water which gathers above the piston working in the submerged cylinder. Such escape-vents have invariably been arranged in the head of the submerged cylinder, and have extended through the main barrel of the pump, so as to discharge the accumulated water into the well.

It is the object of my invention to overcome the difficulties which are present in the constructions referred to, and which are objectionable for the reason that this leakage (which in some cases is considerable) is wasted as it flows back into the well. Further, in bored wells, where the well-opening is of small diameter, the water thus discharged has a washing effect, and is liable to displace the earth on the outside of the main pump-barrel.

By the use of my invention I obviate the objections above referred to, as I allow for the discharge of the accumulated water directly into the main discharge-pipe of the pump, thus saving all leakage and waste, as the water is carried up with the main column and discharged.

My invention also includes means for preventing the entrance of the water from the discharge-passage of the pump into the submerged cylinder above the piston therein; and, further, it includes an improved attachment of the pump barrel and cylinder with the pump-stock.

In the accompanying drawings I have illustrated my invention as applied to a deep-well pump, such as is ordinarily used in bored wells; but I desire it to be understood that I have simply shown the invention in this connection for convenience, and that the invention may be applied to any pump in which a submerged cylinder is used.

Figure 1 represents a vertical central section through the pump-stock, the main barrel, and the submerged cylinder, the lower bucket of the pump being omitted. Fig. 2 is a section of the pump-stock, taken on the line *x x* of Fig. 1, the connection between the stock and the main barrel being shown in elevation. Fig. 3 is a plan view of the submerged cylinder, showing the valve lifted.

In the figures, *a* represents the pump-stock, which is formed as an air-chamber, preferably oblong in cross-section. Cast upon the top of the stock is a standard, *b*, which serves as a support for the pump-handle *c*. Attached to this handle is a piston-rod, *d*, which passes down through a guide-pipe, *e*. This piston-rod carries the ordinary pistons, as *f*, as will hereinafter be more fully described.

In the class of pumps shown an opening is made in the ground by driving or drilling, and in this opening a two or two-and-a-half inch pipe is inserted, fitting closely the opening. This pipe is shown in the figures at A. It is of uniform diameter, and in the present case, after it is driven into the ground, I connect the pump-stock in the following manner: The pump-stock has a lower flange, *h*, to which is connected an annular flange or ring, *i*, by means of bolts, which are secured to the ring *i* and pass up through openings in the flange *h*, being screw-threaded upon their upper ends to receive nuts, thus securing the two parts together.

The bottom of the air-chamber within the pump-stock inclines toward the center, so as to allow of the complete drainage of the water from this chamber. The discharge-spout *k* extends down to near the bottom within this chamber, and the discharge of this water is aided and made regular by the reaction of the air after it has been compressed by the inflowing water. The flange *i* has a projection, *l*, upon its under surface, screw-threaded on its interior periphery, and this rests upon and is screwed to the upper screw-threaded end of the main barrel A. In this manner the pump-stock is supported. The guide-pipe for the piston-rod is screwed into the top plate of the pump-stock, passing down through the air-chamber into the main barrel, where it supports the submerged cylinder B. The upper

end of the flange part *i* is recessed to form a seat, and in this recess is seated a reducing-collar, *n*, with a leather packing-ring, *n'*, beneath the same. The collar *n* is internally screw-threaded, and a short section of pipe, *m*, connects the collar with a screw-threaded opening in the pump-stock.

The piston-rod, from the point where it is shown as broken off, extends down into the well or barrel, with a lift-bucket upon its lower end, a section of the ordinary wooden actuating-rod used in this class of pumps being shown at *o*. As this part of the pump is of ordinary and well-known construction, I have not considered it necessary to show it. The head of the submerged cylinder I perforate, as shown at *p*, and above these perforations I place a disk of leather or other suitable material, *q*, the disk being held in position by means of a jam-nut, *s*. It will thus be seen that in the movement of the piston within the submerged cylinder any water which may have accumulated above the same will be forced out through the perforations in the head, the leather disk allowing of the free passage of the water. The water thus discharged is carried along with the main column of water to the discharge-spout without any waste whatever. The weight of the water above the submerged cylinder tends to keep the leather disk over the perforations in the head, and thus prevents the entrance of the water from the main column into the submerged cylinder above its piston.

It will be understood that instead of the form of valve shown any suitable means may be used to allow of the exit of the water into the main discharge which will at the same time prevent the return of the same.

I arrange the main barrel with a vent, *r*, at or near the level of the submerged cylinder-head, and this keeps the pipes above that line free from water at rest, as after the action of the pump ceases this water will flow back into the well. By reason of the communication between the interior of the submerged cylinder and guide-pipe with the outer water-space, the water in the guide-pipe is always kept at the same level as the water outside in the outer chamber, and is always kept free from the accumulation of water—that is, if, after the action of the pump ceases, water remains in the barrel and guide-pipe above the line of the frost-vent, the water in the barrel will flow out through the vent down to this point, and as the column of water in the barrel lowers the column of water in the guide-pipe will lift the valve over the openings in the cylinder-head, and in this way the two columns will keep the same level until the guide-pipe is entirely emptied.

I am aware that prior to my invention means have been provided to allow for the exit of water from above the piston of the inner or smaller cylinder by passages formed through the piston, with a valve covering the passages when the piston is in action, and, as I have before stated, in pumps of the class to which my invention belongs it has been customary to provide for the leakage past the piston of the submerged cylinder by extending a discharge-passage from the space above the piston to the outside of the pump, and I do not, therefore, broadly claim an exit for the water above the piston in the submerged cylinder.

Having thus described my invention, what I claim is—

1. In a pump, the combination, with the main barrel forming a passage for the column of water in its upward movement to the point of discharge, and a discharge-pipe in connection with the upper end thereof, of a submerged cylinder within the same provided with a piston, and an opening in said submerged cylinder into the barrel above its piston, whereby the water which accumulates above the piston of the submerged cylinder is discharged directly into the column of discharging water, substantially as described.

2. The combination, in a pump, of a main barrel forming a discharge-passage to the surface and in connection at its upper end with the discharge, a cylinder within the same, a piston-rod and pistons, and a valved opening in the submerged cylinder between the cylinder and the main barrel, substantially as described.

3. A pump consisting of a main barrel forming a discharge-passage to the surface, a submerged cylinder within the same, a piston-rod carrying pistons of unequal diameter, a guide-pipe for the piston-rod connected to and supporting the submerged cylinder, and valved openings to the main discharge in the head of the submerged cylinder, substantially as described.

4. A pump consisting of a pump-stock, a main barrel, a submerged cylinder within the barrel, and a piston-rod and piston, combined with a flange, *h*, on the pump-stock, a flanged ring, *i*, suspended from the flange *h*, a collar, *n*, seated in a recess in the upper part of the ring *i*, and a pipe, *m*, connecting the stock and collar *n*, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PHILIP A. MYERS.

Witnesses:
B. S. GROSSCUP,
HENRY BRANT.