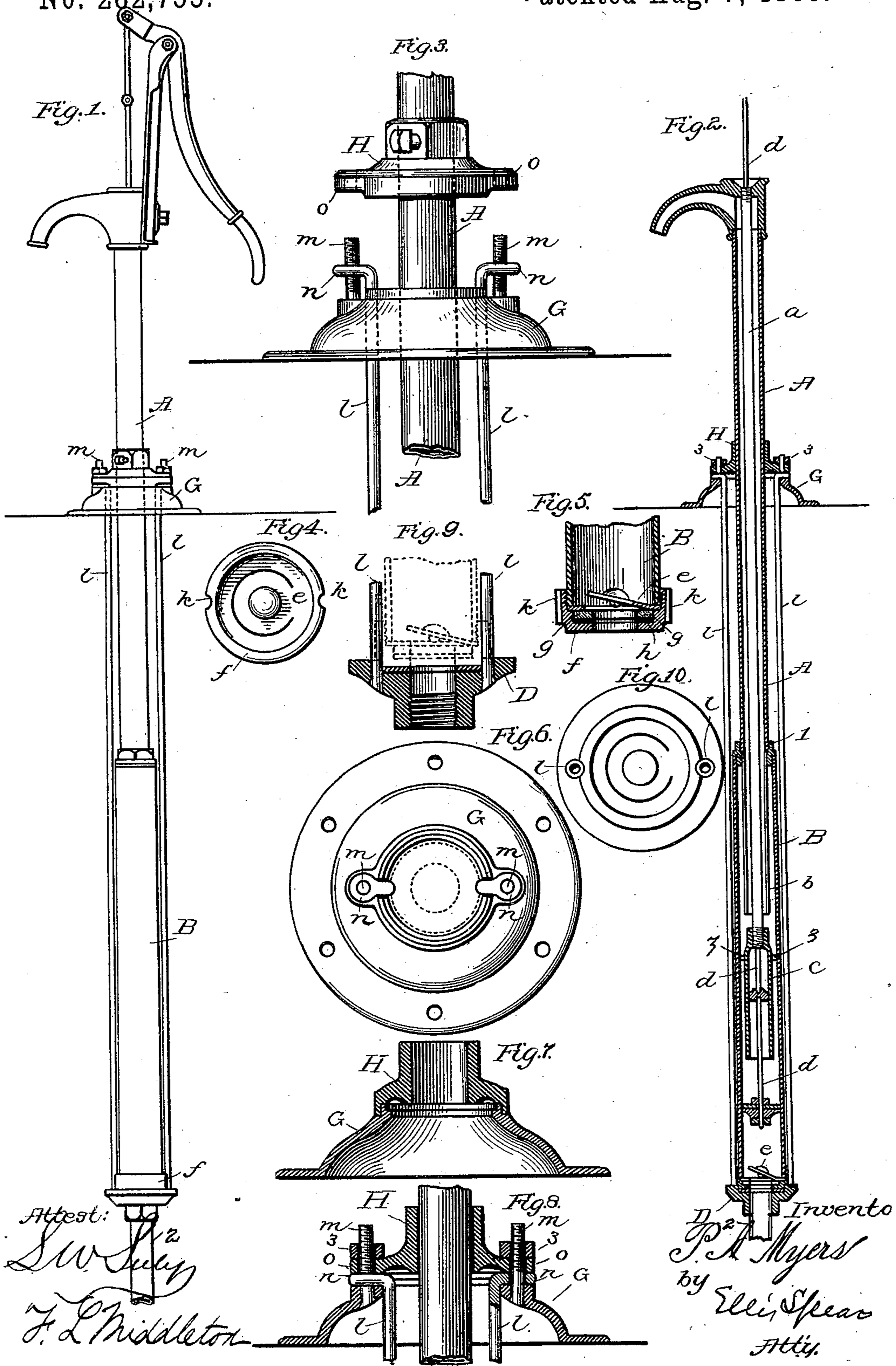


(No Model.)

P. A. MYERS.
PUMP.

No. 282,755.

Patented Aug. 7, 1883.



UNITED STATES PATENT OFFICE.

PHILIP A. MYERS, OF ASHLAND, OHIO, ASSIGNOR TO HIMSELF AND FRANCIS E. MYERS, OF SAME PLACE.

PUMP.

SPECIFICATION forming part of Letters Patent No. 282,755, dated August 7, 1883.

Application filed February 21, 1883. (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 Pumps; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to pumps, and more especially to iron pumps, though parts are applicable to other kinds of pump.

My object is, first, to provide for the easy removal of the piston-cylinder and other parts liable, through wear, to get out of order; secondly, to suspend conveniently the suction-pipe within the well, whereby the said pipe may remain undisturbed in place when the piston-cylinder is removed; third, to form a convenient and secure joint between the fixed suction-pipe and the removable cylinder aforesaid; fourth, to fit the cylinder to the other parts, so that it may be guided accurately when inserted or removed; fifth, to simplify the construction of the piston-cylinder, and to reduce the size of the pump-stock; sixth, to provide cheap and convenient means for suspending the pump in the well; seventh, to improve the valve-seat of the pump.

The devices which I have invented for accomplishing these objects are fully described hereinafter in their proper order, and are particularly pointed out in the claims. I have also illustrated the form of my invention best known to me in the accompanying drawings, in which—

Figure 1 represents a side elevation of the improved pump. Fig. 2 shows a vertical central section of the same, with the suspending-rods and central tube in elevation. Fig. 3 shows in side elevation the base-plate, upper ends of the suspending-rods, and part of the pump-stock, with the base-cap raised from its seat. Fig. 4 is a plan or upper view, and Fig. 5 a central vertical section, of the cap at the lower end of the piston-cylinder, the latter figure showing also the lower end of the said cylinder. Fig. 6 is a top view of the base-plate; Fig. 7, a central vertical section of the same. Fig. 8 shows a central vertical section of the base-plate, with its cap, the upper ends of the suspending-rods, and the means preferred by

me for clamping the parts together. Fig. 9 is an enlarged section of the lower cap, showing the connection of the rods. Fig. 10 is a detail view. Figs. 1 and 2 are on a scale smaller than that of the other figures.

In these figures, A represents the pump-stock, which may be made of ordinary gas-pipe. Its lower end is connected to a piston-cylinder (of larger size of gas-pipe, or of cast metal) by means of a cap or plug, 1. Within the stock or barrel is placed a pipe, *a*, which extends from the top of the pump, opening to the air, down to the upper or smaller piston-cylinder, *c*, to which it is attached and into which it opens. Through this the piston-rod *d* passes, having upon its lower end the ordinary unequal pistons. The cylinder *c* is suspended from the pipe *a*, and is centered within the cylinder B by means of small lugs *z*, which bear against the walls of the said cylinder, the diameter differing to leave sufficient space between the two to admit the passage of the water up past cylinder *c*. This construction is the same as that shown in Letters Patent of the United States granted me on the 5th day of September, 1882, No. 263,944.

From the plug 1 a pipe, *b*, extends down near the cylinder *c*, forming practically a continuation of the stock or barrel A, and these constitute the main water-passage. The space around the pipe-extension *b* forms an air-chamber, in which the air is compressed by the stroke of the pump and reacts on the column of water. If desired, the upper end of the cylinder B may be enlarged to give greater air-space. This may be easily and cheaply done if the cylinder is made of cast metal. The extension *b* may be made of thin sheet metal to economize space, as no strain comes upon it. It is not necessary that the stock should be smaller than the cylinder, but it is on some accounts better. The action of this part of the pump is substantially the same as in my patent aforesaid.

In the lower end of the cylinder B, I place a check-valve, *e*, which is held between the lower end of the cylinder and a cap, *f*; but the particular construction of this part is more fully explained hereinafter. It is sufficient for present purposes to explain that the lower

end of the cylinder or its cap is adapted to bear, with suitable interposed packing, against the cap D of the upper end of the suction-pipe 2. This suction-pipe cap has a suitable seat, such as that shown in Fig. 9. It is formed, by turning or otherwise, to fit accurately the lower end of the cylinder B, so as to form, with the interposed packing, a water-tight joint.

The cap D is suspended from the base-plate G by means of rods *l*. In the form shown in the drawings these rods are firmly secured to the flanges of the cap D, and extend upward, being of proper length to pass through the base-plate. They are formed there with eyes *n n*, bent outwardly at right angles to the rods, so as to pass over threaded bolts *m m*, cast or otherwise fixed in the base-plate. In this way the cap D and the suction-pipe 2, secured thereto, is suspended from the base-plate, and may remain in the well after the stock and pump-cylinder have been removed.

The cap *f* on the lower end of the pump-cylinder is formed with grooves *k* on opposite sides, which are adapted to fit upon the rods *l*, which thus serve as guides to direct the pump-cylinder properly into its place upon the cap D, and thus insure an accurate fit. It is also of advantage thus to guide the cylinder when the pump is withdrawn from the well.

It will be obvious that in order to secure a water-tight joint it is necessary that the lower end of the pump-cylinder or its cap should be pressed and held firmly to the cap D. I accomplish this by means of the threaded bolts *m*, acting in connection with an adjustable cap, H. This cap is shown in Figs. 3, 7, and 8. It is formed with a flange, as shown in Fig. 7, which fits over a flange around the large opening in the base-plate, making a sufficiently tight joint. The opening in the base-plate is large enough to allow the pump-cylinder to pass through. The flange is preferably circular; but the cap is formed with ears *o o*, provided with holes to register with the bolts *m m*.

The cap H is secured at any proper position upon the pump-stock by means of a suitable set-screw or other means. A set-screw is shown. When the said cap is set at a proper point, the cylinder and stock may be lowered into the well, guided on the rods *l*, which run in the notches *k k*, until the ears pass down over the bolts, when, by turning down the nuts upon the bolts, the cap H is brought down with any desired amount of force to brace the cap *f* against the cap D.

It will be obvious that other means may be devised as ready substitutes for this device for attaching the rods *l* to the cap, and for applying the pressure necessary to make a close joint at the bottom of the pump-cylinder. I have shown two rods; but I may use three or more without departing from the spirit of the invention. I may also use, instead of solid rods *l l*, gas-pipe, utilizing the pipe also as air-chambers by having them closed at the top and screwing them into the cap D, and forming passages in the cap leading into the interior of

the cylinder B; or I may connect them through the cap D with the suction-pipe, and use these pipes as vacuum-chambers.

In order to remove the cylinder it is only necessary to remove the nuts 3 3, when the pump-stock may be withdrawn from the well, bringing up the cylinder B, which contains the pistons and the check-valve, and leaving in the well only the suction-pipe. Thus all the parts necessary to be inspected or repaired—that is to say, all the parts which are liable to get out of order from use—are capable of very easy removal and as easy replacement.

My improved glass seat and its arrangement in relation to the packing and the cylinder-cap are shown more clearly in Fig. 5. The cap *f* is chambered out, as shown in said figure, to receive the glass valve-seat *g*, which is simply an annular plate of proper size and thickness to fit in the chamber. Underneath the glass seat I place a packing-ring, *h*, preferably of rubber, and lying upon the flat bottom of the cavity. Above the glass seat is placed the ordinary leather valve, *e*, (shown clearly in Figs. 4 and 5,) the edges of the leather extending outwardly far enough to form a packing for the end of the cylinder B as it is screwed into the cap *f*. Thus the glass is held firmly between the leather and the rubber, and makes a smooth inexpensive valve-seat which is not capable of corroding. The form of the glass seat as shown is the preferable form, being a cheap and easy one to make; but I do not limit myself to the precise form.

The action of the pump will be readily understood from the description heretofore given. The pump-rod *d*, passing through the pipe *a*, carries the pistons up and down within the cylinders *c* and B, forces the water up around the cylinder *c*, and up within the pipe *b* into the pump-barrel, and as the pipe *a* is open at the top the air passes freely into the cylinder *c* above the piston as it moves downward; but the air in the annular chamber about the pipe *b* and within the cylinder B is compressed at each stroke, and between the strokes reacts in the ordinary manner of air-chambers.

The construction is adapted to deep-well pumps, but may be used in any ordinary well, and the base-plate G need not be removed nor any part of the pump disturbed, excepting those parts liable to get out of repair from use.

I am aware that it is not new to suspend a pump in a well by means of rods having their upper ends secured in the platform, and I desire particularly to distinguish my invention from that construction, which I am aware is very old. My object in respect to this part of my invention is to provide for the removal of the pump stock and cylinder, with its piston-rod and pistons, without removing or disturbing the suction-pipe; and to gain the additional advantage of removing all the valves with the pump-cylinder I have located the suction-valve, not in the suction-pipe, but in the lower end of the pump-cylinder, as heretofore explained.

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

1. A suction-pipe separable from the pump-cylinder, devices, substantially as described, whereby said suction-pipe is suspended from the platform, a pump stock and cylinder, with its piston-rod and pistons, adapted to be inserted through the platform and to be united to the suspended suction-pipe and to be removed therefrom, and devices, substantially as described, for holding the pump stock and cylinder in close connection with the suction-pipe.
2. The pump stock and cylinder B, having piston-rod and pistons, in combination with the cap D and suction-pipe, and with the rods *l l*, connecting the cap to the base, substantially as described.
3. The pump stock and cylinder B, having pipe *b*, cylinder *c*, pipe *a*, piston-rod and pistons, in combination with suitable supports, and with a suction-pipe and valve, substantially as described.
4. The independently-removable pump stock and cylinder B, having the interior water-forcing apparatus and the check-valve in the bottom of said cylinder, in combination with a suspended cap and suction-pipe, and suspending devices, and devices for holding said stock and cylinder closely to the suction-pipe, substantially as described.
5. In combination with the removable cylinder and stock and the suspended cap and

suction-pipe, the rods or pipes *l l*, attached to the base, the cap H, attached adjustably to the stock, and devices for drawing down the said cap, substantially as described.

6. The suspending-rods *l l*, bent as described, to surround the bolts, in combination with the bolts *m*, nuts 3, cap H, and pump stock, cylinder, and suction-pipe, substantially as described.

7. The combination of the cap H, having flanges and ears, the base G, the bolts fixed therein, the suspending-rods of the pump, and the nuts, substantially as described.

8. The cap *f* of the cylinder B, having notches to fit the rods, in combination with said rods, and with the cap D and the suction-pipe, substantially as described.

9. In combination with the pump-cylinder having the valve, the cap *f*, provided with the chamber, a glass seat fitted to said chamber, and suitable packing, all substantially as described.

10. In a pump, and in combination with a cylinder, B, and recessed cap *f*, a packing, *h*, glass seat *g*, and valve *e*, the valve-edge forming the upper packing, 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:

CYRUS PLANK,
J. P. DEVON.