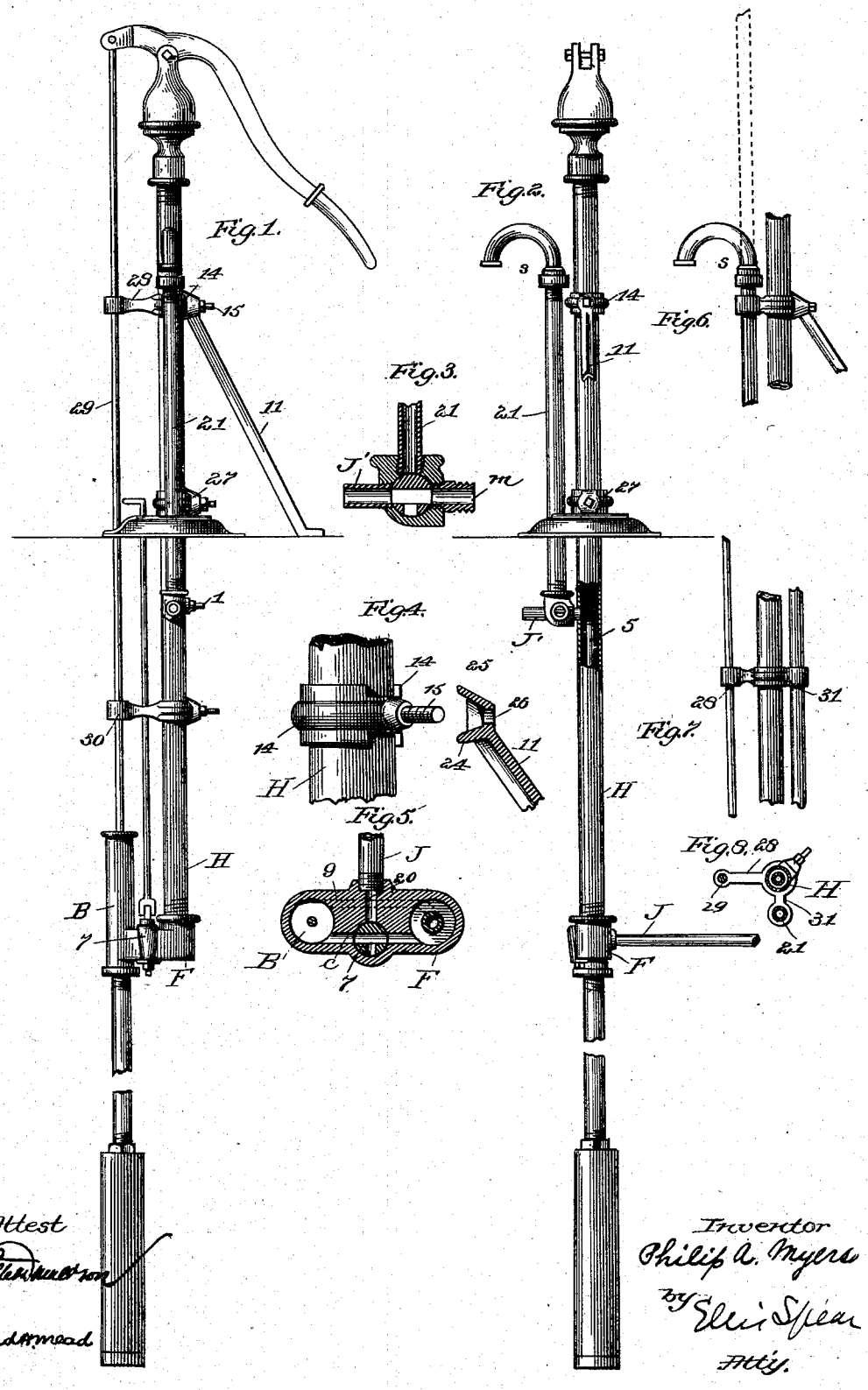
(No Model.) 2 Sheets—Sheet 1.

P. A. MYERS.

PUMP.

No. 276,865. Patented May 1, 1883.



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(No Model.) 2 Sheets—Sheet. 2.

P. A. MYERS.

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Fig. 12.

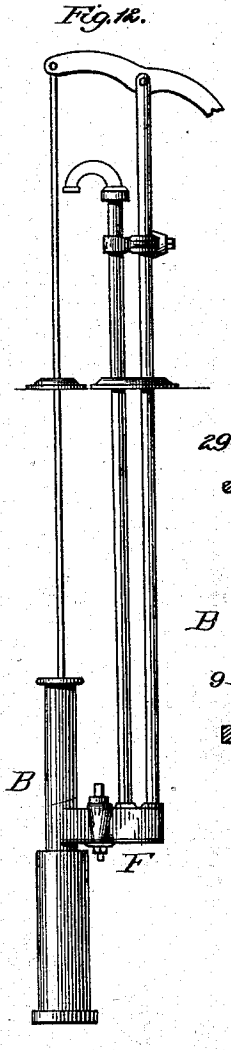


Fig. 9.

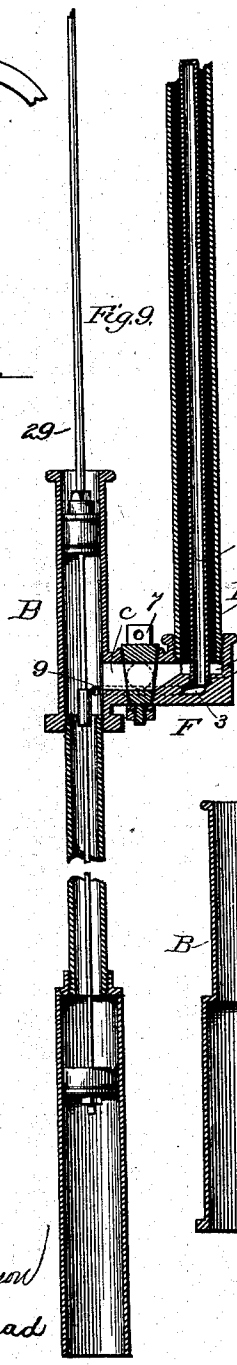


Fig. 10.

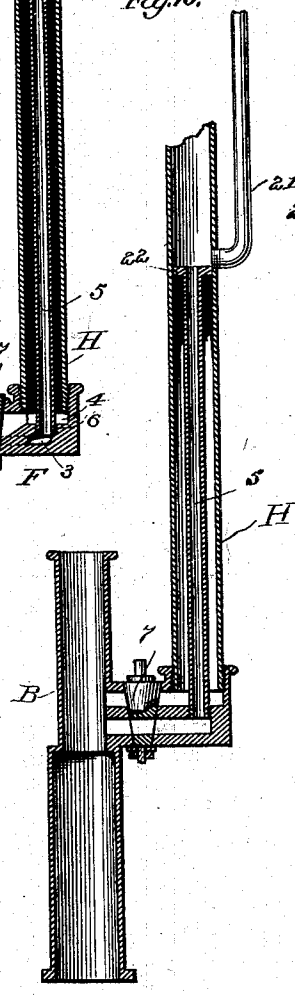
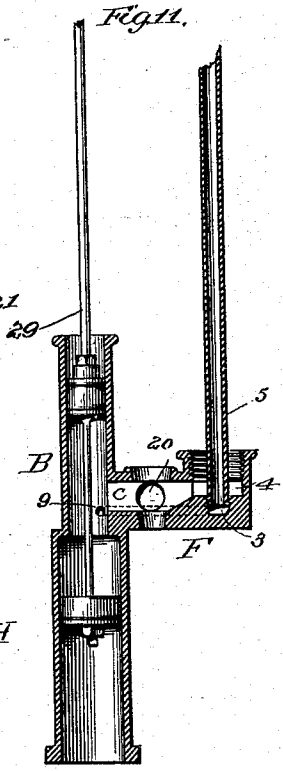


Fig. 11.



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UNITED STATES PATENT OFFICE.

PHILIP A. MYERS, OF ASHLAND, OHIO.

PUMP.

SPECIFICATION forming part of Letters Patent No. 276,865, dated May 1, 1883.

Application filed December 12, 1882. (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 force or force-and-lift pumps combined, and is applicable especially to force-and-lift pumps of the class shown in Letters Patent of the United States reissued to me on the 10th day of February, 1882, numbered 10,048.

My invention consists, first, in a divided air-chamber, one part of which acts against the column of water at the point where it is forced from the forcing-cylinder, and the other at the point where it is forced from the pump-barrel into the spout or into the branch directly connected to the spout.

The second part consists of an air-passage in the offset from the pump or forcing-cylinder leading through a three-way cock, and in connection with a lower air-chamber and with a branch pipe and the main discharge-pipe, whereby the said lower air-chamber may act upon either branch or main pipes.

The third part of my invention consists of special construction of the offset and pump-cylinder.

The fourth part consists in the special construction of the clamp for the pump-brace, which clamp is also applicable to the base or plate of the pump-barrel.

Various improved details are included with the above-specified features, all of which are fully described and particularly claimed.

In the accompanying drawings, Figure 1 shows a front elevation of the entire pump, and Fig. 2 a side elevation. Figs. 3, 4, 5, 6, 7, and 8 represent details of construction. Fig. 9 is a longitudinal section of Fig. 1. Figs. 10, 11, and 12 represent separate views of modifications.

In the construction shown the upper part, B, of the pump-cylinder is cast with an offset, F, which in general form and function is like that shown in my aforesaid patent; but the interior differs in construction in order to adapt it to the lower air-chamber and to the branch pipe. The main discharge-pipe H is screwed into the upper side of the offset at its outer end, opening into what I have called a "water-chamber" in the upper part of the offset. This water-chamber communicates with the interior of the cylinder B by means of a water-passage, *c*. In the lower part of the outer end of the offset is an air-chamber, 3, separated from the water-chamber by a diaphragm, 6. This air-chamber communicates with the interior of the cylinder B by means of a passage, 9, passing through the lower part of the offset. Into the diaphragm is screwed an air-pipe, 5, closed at its upper end and opening at its lower end into the air-chamber. A passage, 20, is made in the offset, transversely opening into the water-passage, and into the outer end of this passage is screwed the branch pipe J, which may lead under ground to house, stable, or like connections. At the juncture of the water-passage 20 and transverse branch passage *c* in the offset is a seat for a three-way cock, 7, by means of which communication is always kept open with the cylinder, but may be shut off from either the main discharge-pipe H or the branch pipe J.

It will be apparent from an inspection of the figure and the foregoing description that the air pipe or chamber 5 may be in communication with either the branch or the main discharge-pipe, according as the three-way cock is turned to connect one or the other with the cylinder, and in action, when the piston forces water, the water enters the water-passage 9, and if the cock be turned to open to the main pipe the water passes thereto. At the same time the water enters the air-pipe and passes to the air-chamber, forcing back and condensing the air in the air pipe or chamber; but if the cock be turned to make connections with the branch pipe, the water is directed and forced there, the pressure upon the air being the same. Upon cessation of the stroke the expansion or removal of piston-pressure forces back the water into the cylinder. There being no other escape from the cylinder, it is forced through the water-passage and three-way cock, either to the branch or main pipe, as the case may be, and thus the air pipe or chamber acts upon either the branch or main pipe to keep up a constant flow of water. For this action the height of the pipe 5, which forms this air-chamber, thus acting against the water at the offset from the cylinder, is not material. It may extend,

if desired, quite to the top of the main discharge-pipe or pump-barrel; but I have devised a second air-chamber, which may advantageously operate in connection with this inverted pipe and operate against the water above the orifice at which the water is expelled from the pump-barrel or main discharge-pipe. I do this by making the lower air-pipe terminate below the discharge-orifice, and thus utilize the upper part of said pump-barrel as an air-chamber. To elongate this air-chamber I place the spout branch 21 in communication with the pump-barrel at a point below the platform, which gives an elongated air-chamber in the barrel adapted to react upon the column of water at the discharge-orifice. This arrangement of the spout branch opening beneath the platform is especially appropriate in connection with a modification in the location of the three-way cock and branch pipe shown in Figs. 2 and 3. In some situations it is desirable to have the branch pipe above ground. This is necessary in drilled wells, and is desirable where the pump is located in cellars or outhouses or like situations, or where branches are needed in two directions. To meet these requirements and objects I place the three-way cock at the juncture of the spout branch with the main pipe or barrel.

In Figs. 2 and 3 the offset is shown as a simple brass or iron coupling having a connecting-pipe, *m*, screwed into the pump-barrel, and a branch pipe, J′, and spout pipe 21. This branch may extend to any desired point. The three-way cock is of ordinary construction, and may be provided with an arm, 1, which may be connected to a rod extending through the platform; or it may be operated by lifting a trap-door and reaching in. The branch pipe in this modification receives its air-pressure from the air-chamber in the upper part of the pump-barrel. From this arrangement I derive another important advantage and increase materially the resources and capacity of the pump. In some situations it is desirable to have two branch pipes in addition to the ordinary spout. I can provide these by using the branch pipe and three-way cock at the junction of the spout pipe in addition to the branch pipe on the offset on the pump-cylinder, as heretofore explained. In this case the two (upper and lower) air-chambers act together upon the upper branch and spout, while the lower air-chamber alone acts in connection with the lower branch pipe. The lower branch may be used as stable-connection, and the upper for house, or for a hose to be used in washing carriages, or garden use. The special construction of the spout-branch renders it also available for connection with a reservoir in the house or stable, as the crook or spout *s* may be removed, and a pipe or hose screwed onto the upper end of this branch, as indicated in dotted lines in Fig. 6.

In Figs. 2 and 9 I have shown the inner pipe, 5, adapted to be used as an air-pipe. By simple inversion of the parts this may be used as a discharge-pipe, and the air be contained in the annular space between the pipe 5 and the main pipe H. This modification is shown in Fig. 10, in which the inner pipe, 5, passes through a tight diaphragm, 22, just below the spout branch 21. In this case the pipe 5 is in connection with the water-passage and the pipe H with the air-passage of the offset. In all other respects the construction is the same, and the action is precisely the same as in the construction first described.

In Figs. 10, 11, and 12 the ordinary unequal pump-cylinders are shown, and in Figs. 1, 2, and 9 I have shown the deep-well form of separate levers, cylinder, and connecting-pipe shown in Letters Patent granted me on the 5th day of September, 1882. Either form of cylinder may be used in connection with the improvements herein described, it requiring only an offset on the upper and smaller cylinder. In the form herein shown I cast the offset and upper cylinder in one piece and connect the upper and lower by small pipe.

In Fig. 4 I have shown the details of an improved clamp for the brace 11. It consists of a ring or band, 14, preferably cast, and with a boss which includes a threaded bolt, 15. On each side of the boss is a notch, and the band is fitted to slip snugly over the barrel. The brace 11 is cast with a socket on its upper end, with upper and lower projections, 25 and 24, which fit into the notches in the band and press against the surface of the barrel. The bolt passes through a hole, 26, in the brace, and when the nut is turned on it causes the projections 24 25 to press on the pump-barrel, and draws the band, causing it to clamp securely the brace to the barrel. The same device I have applied to the collar of the base, as shown in Fig. 1 at 27. These sliding clamp-connections in the brace and in the base serve an important purpose. In many situations it is desirable to change the height of the pump barrel and spout from the platform. As ordinarily made, pumps do not admit of this adjustment, by reason of the rigid connections between the brace or base and the barrel. The clamps as described allow any adjustment desired, and it is only necessary to determine the height of the pump and then turn up the nuts to give proper compression to the clamps. The brace may also be turned aside to bring it to any convenient position. To the upper band I add an arm, 28, as shown in Figs. 1 and 8. This has a hole to receive the piston-rod 29, and serves as a guide therefor. A similar guide-arm may be used below, as shown at 30 in Fig. 1. In Fig. 8 I have shown a second arm, 31, embracing the spout pipe.

Instead of having the discharge and air pipes one within the other, and connecting them by passages to the cylinder, I may place them side by side, as shown in Fig. 12. In this case the connections with the branch pipe and three-way cock may be the same and with the same effect.

The three-way cocks may be operated in any

convenient way. In Fig. 1 I have shown a rod extending up through the platform with a laterally-bent arm.

Having thus described my invention, what I claim is—

1. In a pump, a forcing-cylinder having an offset thereon, a discharge-passage in said offset connecting the cylinder with the main discharge-pipe, a passage also in said offset connecting the cylinder with an air-chamber, a branch passage connecting in said offset with a branch pipe, and a three-way cock at the junction of the branch with the passage to the main discharge-pipe, whereby the water may be turned in the said offset, either to the main or branch discharge-pipe, whereby the air-chamber may act on either the main or branch discharge-pipes, substantially as described.

2. In a pump and in combination, a forcing-cylinder, a discharge-pipe connected therewith, an air-chamber concentric with the main-pipe opening to the water-passage at or near the forcing-cylinder, and extending upward and terminating below the discharge-opening, and an upper air-chamber closed above and opening below at the discharge-opening, substantially as described.

3. In a pump, the offset adapted to receive the main discharge-pipe, cast with the upper small part of forcing-cylinder, in combination with the larger cylinder and the intermediate connecting-pipe, substantially as described.

4. In a pump, a forcing-cylinder, a main pipe or barrel connected therewith and extending through the base and above the platform, a spout branch connected directly to said barrel, near the base or platform, said barrel being closed at its upper end to form an air-chamber, all as set forth.

5. In combination with a pump, the described clamp consisting of the band provided with threaded bolt and notches, in combination with the brace of the pump, having socket and projections fitted to the notches in the band, all 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:
E. N. HARVNOT,
F. C. SEMPLE.