R. WHITE, R. WALLACE, & D. MORITZ.

PUMP.

No. 195,780. Patented Oct. 2, 1877

Fig: 1.

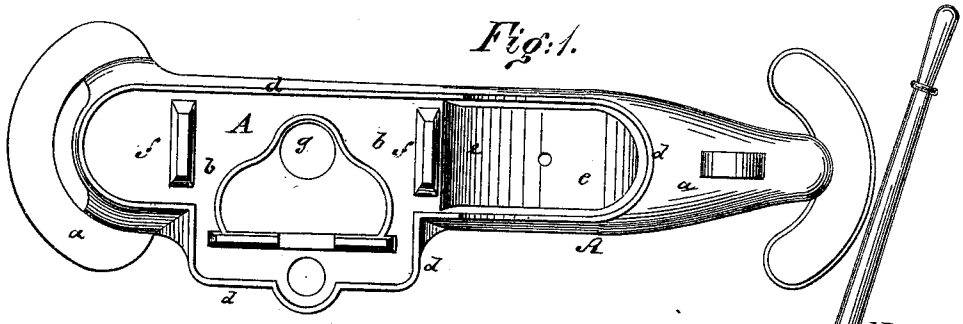


Fig: 2.

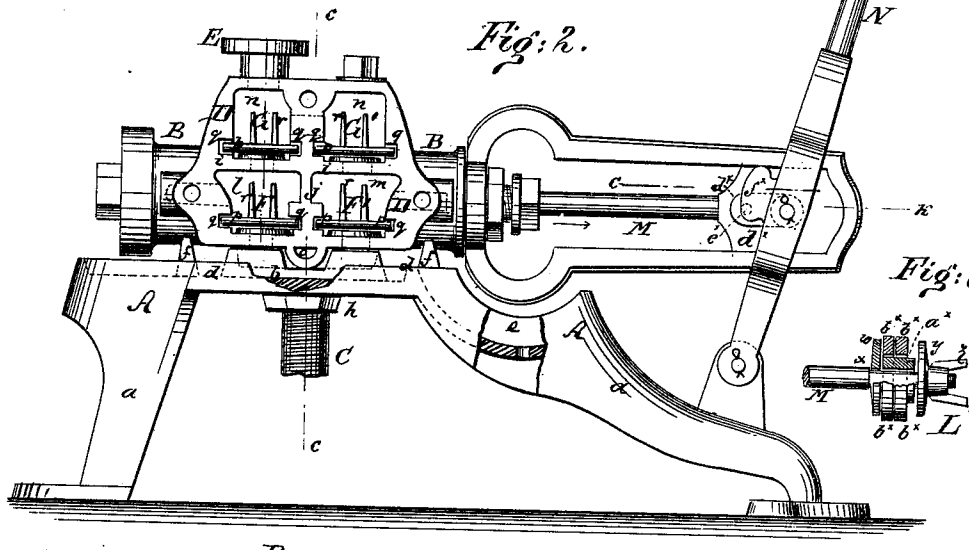


Fig: 11.

Fig: 3.

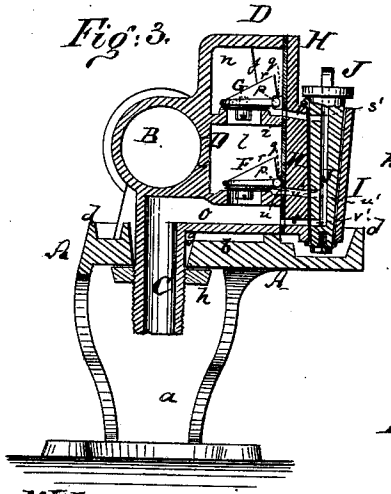


Fig: 4.

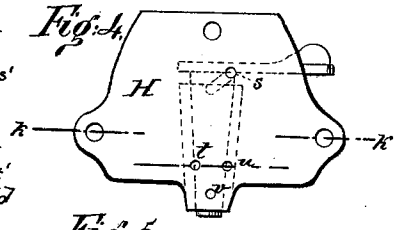


Fig: 5

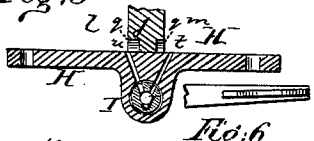


Fig: 7.

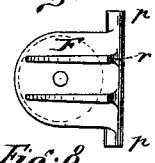


Fig: 8.

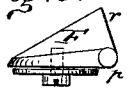


Fig 9.

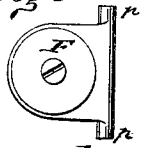


Fig: 10.

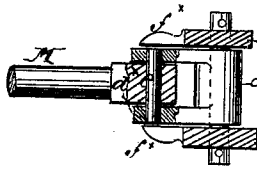
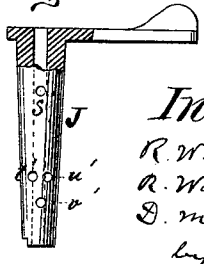


Fig: 6



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UNITED STATES PATENT OFFICE.

ROBERT WHITE, OF BROOKLYN, AND ROBERT WALLACE AND DAVID MORITZ, OF NEW YORK, N. Y.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **195,780**, dated October 2, 1877; application filed February 17, 1877.

To all whom it may concern:

Be it known that we, ROBERT WHITE, of Brooklyn, in the county of Kings and State of New York, and ROBERT WALLACE and DAVID MORITZ, both of New York city, in the county of New York, and State of New York, have invented a new and Improved Pump, of which the following is a specification:

Figure 1 is a plan or top view of the bed or frame of our improved pump, from which the cylinder and operating parts are disconnected. Fig. 2 is a side elevation of the pump, the face-plate of the valve-chamber being removed to show the valves and chambers. Fig. 3 is a vertical cross-section of the pump on the plane of the line *c c*, Fig. 2. Fig. 4 is an inner face view of the plate which closes the valve-chamber. Fig. 5 is a horizontal section of said plate on the plane of the line *k k*, Fig. 4. Fig. 6 is a side view, partly in section, of the hollow anti-freezing plug which I attach to the side plate; Fig. 7, a detail top view of one of the valves; Fig. 8, a detail side view; Fig. 9, a detail bottom view of one of the valves. Fig. 10 is a detail horizontal section on the line C K, Fig. 2, showing the connection of the operating-lever with the plunger-rod. Fig. 11 is a detail central section through the piston or plunger.

Similar letters of reference indicate corresponding parts in all the figures.

This invention relates to certain improvements in the kind of pump described in Letters Patent No. 131,644, dated September 24, 1872, and granted to these applicants, R. White and D. Moritz.

The object of the present invention is, first, to improve the arrangement of the valves, their construction, and their location in the valve-chambers, in such manner that the valve-chambers may readily be reached, the valves removed for repair or inspection, and easily replaced.

Another object of the invention is to improve the construction of the plunger or piston, to improve the means of connecting the operating-lever with the plunger-rod, to provide against the detention of water within the pump during cold weather, and consequently against the danger of freezing up parts of the pump; and to also provide for the proper collection of the drip-water which may be discharged from the pump, or any parts thereof, so that the drip may not interfere with the locality in which the pump is put up.

The invention consists in an improved manner of placing and constructing the valves, improved arrangement of anti-freezing channels and cock, improved manner of connecting the handle by a link with the plunger-rod, and in an improvement in the means of holding the pin that joins said link to the piston-rod; also, in improvements in the frame or bed of the pump, and in a new construction of plunger or piston, all as hereinafter more fully described.

The letter A in the drawing represents the frame or bed of the pump. It is made of cast metal, or other suitable material, and preferably raised on legs, as shown. It is made a nearly flat bed, *b*, which is supported by said legs. This bed is surrounded by a projecting ledge, *d*, which serves to prevent drip-water from flowing down along the sides or end of the bed, except where the ledge is interrupted, and leads into the depression or cavity *e*, in which all the drip-water of the pump is collected, and from which it may be discharged through a suitable aperture into a suitable receptacle. From the bed project, also, saddle-pieces *f f*, which constitute the direct supports for the pump-cylinder B. This pump-cylinder is intimately connected with the suction-pipe C, which projects downwardly through a hole, *g*, of the bed *b*, and which is threaded to receive a nut, *h*, beneath the bed *b*, as shown in Figs. 2 and 3, so that by such nut *h* the pump-cylinder is firmly drawn upon the saddles *f*, and held in place on the frame A. The pump-cylinder is also intimately connected with the valve-box D, which, by a horizontal partition, *i*, is divided into an upper and a lower compartment, the lower compartment being, by a vertical partition, *j*, further divided into two separate chambers, *l* and *m*. The upper compartment *n*, above the partition *i*, is continuous—that is to say, although there is, or may be, a vertical partition therein, yet such partition is perforated, so that in reality but one single compartment, *n*, exists. The discharge-pipe E

of the pump connects with the upper compartment *n* of the valve-box, while the suction-pipe C connects, by a hollow branch or chamber, *o*, which is clearly shown in Fig. 3, with the two lower compartments *l* and *m*. These lower compartments also connect by suitable openings and passages with the ports that lead into the respective ends of the pump-cylinder B.

The holes which lead from the supply-chamber *o* into the chambers *l m* are closed by valves F and F′. The partition *i* has also two holes, which connect the chamber *n* with the chambers *l* and *m*, respectively, and which are closed by valves G G′.

The pump operation is that of every ordinary pump with respect to the said valves—that is to say, when the plunger is moved in the direction of the arrow shown in Fig. 2 the valve F will be opened and water sucked into the cylinder behind the piston; the valve G will be closed by the suction created in the chamber *l*; the valve F′ will be closed by the pressure of water discharged by the piston into the chamber *m*, and by the same pressure the valve G′ will be pushed open, so that the water may, from the chamber *m*, be forced through the chamber *n* into the discharge-pipe E. When the motion of the piston is reversed, the valves F′ and G are opened, and the valves F and G′ closed, all of which need not be further demonstrated.

The valves which we choose to employ are flat plates, as shown in Figs. 7, 8, and 9, of a size sufficient to cause them to close the openings beneath and they are made of metal or other suitable material of sufficient weight to cause them to close the openings, unless suction or pressure is applied to open them. Each of these plate-valves has at the outer end two projecting lugs, *p p*, which are in line with each other, as shown in Figs. 7 and 9, and preferably of cylindrical form. For the reception of these lugs, recesses or notches are cut into the edges of the walls and vertical partitions of the valve-box D, said recesses being marked *q* in Figs. 2 and 3. The valves are introduced between the ends and upright partition of the valve-chamber, but the lugs *p* will only enter the recesses *q*, and will therein constitute pivots whereon the valves are turned in their upward and downward play. We deem this construction of valve and their combination with the valve-box, that has the recesses *q*, an important feature of our invention, as it enables us, whenever the face-plate H of the valve-box is removed, to readily withdraw the valves and as readily replace them. Each of the valves has one or more projecting lugs or stops, *r*, which, in the raised position, strikes the face-plate H, and prevents the tilting of the valves to a greater extent than may be desired.

The face-plate H, which is bolted or screwed over the open side of the valve-box, is provided with four holes, *s t u v*, as clearly shown in Figs. 3, 4, and 5; but the lower hole V may be omitted. These holes lead into a cylindrical or slightly conical chamber, I, which is formed on or fastened to the outer side of said face-plate H, and which receives a hollow plug or cock, J. This cock contains apertures *s′ t′ u′ v′*, which correspond, and are respectively in line with the apertures *s t u v* of the face-plate, and which all lead into a hollow passage or cavity formed in the cock J, as indicated in Fig. 3. The upper passage *s* of the face-plate communicates with the chamber *n*, the lower passages *t u* communicate with the chambers *l m*, respectively, while the lowermost passage *v*, if used, communicates with the water-supply chamber *o* of the pump. When the cock J by its handle is turned to bring its apertures *s′ t′ u′ v′* in line, respectively, with the apertures *s t u v*, the water contained in the chambers *l*, *m*, and *n* will flow into the hollow cock J, and thence, through the openings *v′ v*, back into the supply-pipe. The central part of the cock J, which communicates with the apertures *s′ t′ u′ v′* is at or near its upper end open to the air. Instead of discharging the water through the cock J into the supply-pipe, the said cock may be so hollowed that it will discharge directly upon the bed-plate of the frame A, or into any other receptacle. When the pump is to operate, the cock J is turned so as to close the apertures *s t u v*, and prevent the discharge of water through them. The cock J is to be used simply when the water in the pump is to be prevented from freezing, and while the pump is not in operation.

L is the plunger, and M the plunger or piston rod. The body of the plunger is composed of a metal plate, *w*, which rests against a shoulder, *x*, of the piston-rod, and of another metal plate, *y*, which, by a screw, *z*, is screwed against an elastic annular plate, $a^{\times}$, which surrounds the piston-rod between the plates *w* and *y*, as shown in Fig. 11. The annular plate $a^{\times}$ is made of rubber, and of much smaller external diameter than the plates *w y*. Around this annular plate $a^{\times}$ are placed one or more leather rings, $b^{\times}$, whose inner diameters correspond substantially with the outer diameter of the rubber ring $a^{\times}$. The outer diameters of the leather rings $b^{\times}$ are intended to fit tightly into the cylinder B, but when the plunger begins to run too easy, the nut *z* is screwed farther toward the shoulder *x*, so as to compress—*i. e.*, flatten—the rubber ring $a^{\times}$, and thereby enlarge its diameter, and expand the leather rings $b^{\times}$. We find this construction of the plunger to be far superior to any other heretofore proposed.

N is the operating-lever of the pump. It is by a pivot-pin connected by a link, $d^{\times}$, which is connected with the cross-head at the end of the plunger-rod M by another pivot-pin, $e^{\times}$, or, if the cross-head is to be dispensed with, the link may be joined by said pin $e^{\times}$ directly to the plunger-rod M. The pivot-pin $e^{\times}$, which joins the link $d^{\times}$ to the plunger-rod M, is held in place by two projecting cheeks or wings, $f^{\times}$, that are formed on the lever N, said lever straddling the piston-rod in the usual manner.

By these cheeks or wings $f^{\times}$ we are enabled to hold the pivot $e^{\times}$ in place without requiring additional means of fastening it, such as expensive screw-thread or transverse pins, or other device. The link-connection $d^{\times}$, between the lever and plunger-rod, we deem an important improvement, as it enables us to dispense with considerable friction in operating the pump.

We claim as our invention—

1. The pump-frame A, made with the bed *b* and surrounding ledge *d*, and with the depressed cavity *e*, all arranged to constitute a drain-box, substantially as herein shown and described.

2. The combination of the valve-box D, made with recesses or notches *q* at the face of its valve-chamber, with the removable face-plate H, and with the valve F, which has outwardly-projecting lugs *p p*, the body of the valve being as wide as the valve-chamber, but the lugs extending beyond said chamber, all arranged so that the valves can be horizontally withdrawn when the plate H is removed, substantially as herein shown and described.

3. The face-plate H of the valve-box, made with apertures *s*, *t*, and *u*, for the purpose of discharging water from the chambers *l*, *m*, and *n* of the pump, substantially as herein shown and described.

4. The combination of the cock J, which has the apertures *s' t' u'*, with the face-plate H, having apertures *s t u*, substantially as and for the purpose herein shown and described.

5. The combination of the operating-lever N by two separate pivots, with the connecting-link $d^{\times}$ and plunger-rod M, one of said pivots joining the lever to the said link, while the other pivot, $e^{\times}$, joins the link to said rod M, substantially as herein shown and described.

6. The operating-lever N, provided with the projecting wings or cheeks $f^{\times}$, to operate in combination with the link $d^{\times}$ that joins said lever to the plunger-rod, substantially as specified.

7. The plunger L, constructed with metal plates *w y*, central rubber ring $a^{\times}$, outer leather ring or rings $b^{\times}$, and compression-nut *z*, all arranged so that by means of the plates *w y* the ring $a^{\times}$ can be compressed horizontally and expanded circumferentially, substantially as herein shown and described.

8. The combination of the valve-box D with the perforated face-plate H, and perforated cock J, and with the supply-pipe C, all arranged to discharge water from the valve-box into the supply-pipe, as set forth.

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