J. W. DOUGLAS.

PUMP.

No. 38,444. Patented May 5, 1863.

Fig: 1.

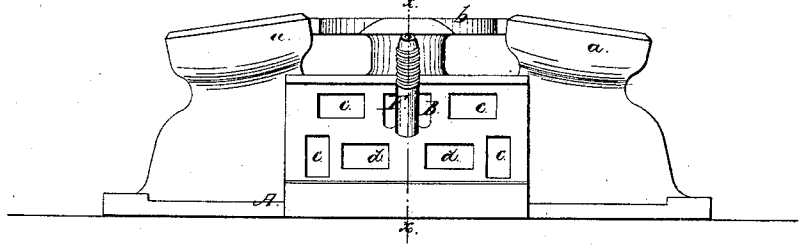


Fig: 2.

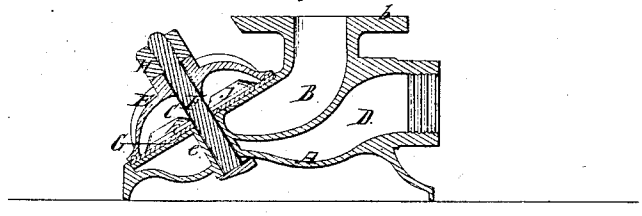


Fig: 3

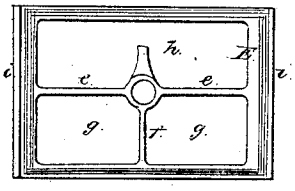
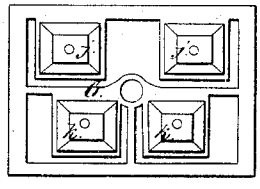


Fig: 4.



Witnesses:

G W Coombs
G W Reed

Inventor:

Joseph W. Douglas
per Munn & Co

UNITED STATES PATENT OFFICE.

JOSEPH W. DOUGLAS, OF MIDDLETOWN, CONNECTICUT, ASSIGNOR TO W. & B. DOUGLAS, OF SAME PLACE.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **38,444**, dated May 5, 1863.

To all whom it may concern:

Be it known that I, JOSEPH W. DOUGLAS, of Middletown, in the county of Middlesex and State of Connecticut, 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, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side view of a portion of a pump having my invention applied to it; Fig. 2, a transverse vertical section of the same, taken in line *x x*, Fig. 1; Fig. 3, a detached inner side view of the cap which covers the valves; Fig. 4, a detached face view of the valves.

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

This invention relates to an improvement in force-pumps; and it consists in a novel arrangement of the valves and valve-box, as hereinafter fully shown and described, whereby all the valves may be rendered accessible by the removal of one nut only.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A represents a base, on which two pump-cylinders are secured, *a a* being the sockets into which they are screwed, and B represents a water-passage in said base, which passage at its upper end communicates with an air-chamber resting on a flange, *b*.

C represents a valve-box, which communicates with the passage B of the air-chamber and also with the suction-passage D and the two pump-cylinders. The orifices of all these passages are shown in Fig. 1, *c c* being the passages which lead to the pump-cylinders.

B is the air-chamber passage, and *d d* the suction-passages. The suction-passage, it will be seen, has two orifices, and also each pump-cylinder passage, said passages being divaricated or forked.

The orifices shown in Fig. 1 are in an inclined plate, which forms the valve-seat, the valve-box being formed by a cap, E, which covers the valve-seat, and is provided internally with partitions *e e f*. (See Fig. 3.) These partitions divide the valve-box into three compartments, *g g h*. The compartment *h* extends the whole length of the valve-box and communicates with the upper orifices, *c*, of both pump-cylinder passages, and also with the air-chamber passage B. The other compartments, *g g*, communicate each with a lower orifice, *c*, of a pump-cylinder passage and with one of the suction-orifices *d*.

F is a bolt, which passes through a pier, *e*, in the suction-passage and through the center of the cap E. This cap has a pendent flange or lip, *i*, at each end of it, and these flanges or lips project down at each side of the valve-seat. When the cap is fitted on its seat the former will be prevented from turning out of a proper position.

The valves are all cut in a single piece of leather, G. (See Fig. 4.)

j j represent the valves which cover the upper orifices, *c*, of the pump cylinder passages, and *k k* the lower valves, which cover the suction-orifices *d d*, the lower orifices, *c c*, of the pump-cylinder passages being always open, as well as the orifice of the air-chamber passage B. The valves all have metal plates attached to them, and the leather G is retained in proper position by the cap E, which presses upon it when secured in position by a nut, H, on the upper end of the bolt F, the leather serving as a packing for the valve-box.

The operation of the pump will be readily seen. When a suction is formed in one cylinder by the rising of its piston, the water raises the valve *k*, which covers the suction-orifice *d* within the compartment *g*, which communicates with said cylinder, and the latter is filled with water below the piston, and the piston of the other cylinder, meanwhile descending, forces the water previously drawn up within it through the valve *j*, over its upper suction-orifice, and thence through the passage B into the air-chamber and out through the eduction-pipe communicating therewith. The two pistons thus alternately draw up the water into their respective cylinders and force it into the air-chamber and out through the eduction-pipe.

It will be seen from the above description that the valves are rendered very accessible all that is required to expose the valves being simply to remove the nut H. The valves, therefore, of the pump may be repaired or replaced by new ones with the greatest facility,

and the pump always kept in perfect working order.

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

The valves *j j k k*, all placed on one and the same plate, when used in combination and arranged with a cap, E, and a single screw-bolt, F, passing through a pier, *e*, substantially as shown and described.

JOS. W. DOUGLAS.

Witnesses:
JOHN M. DOUGLAS,
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