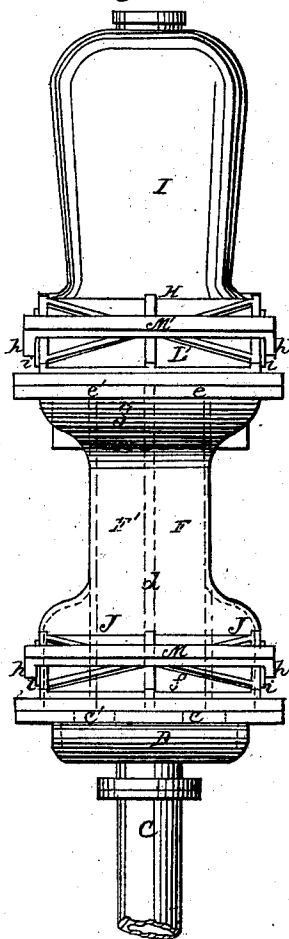


*G. Marshall,*  
*Force Pump.*

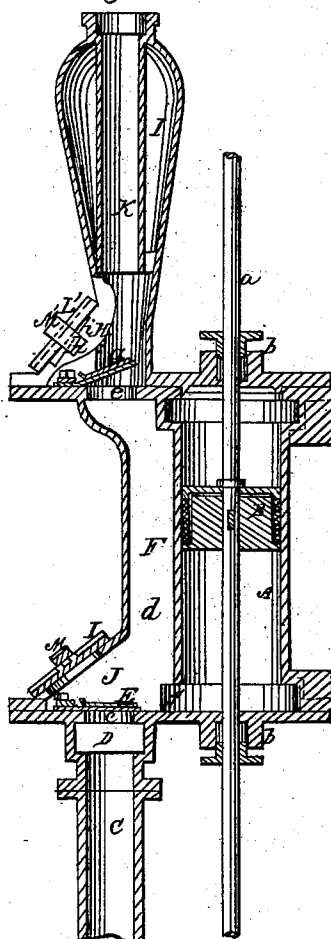
*N<sup>o</sup> 80418.*

*Patented July 28/1868.*

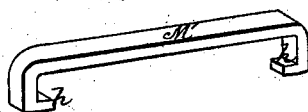
*Fig. 1*



*Fig. 2*



*Fig. 3*



*Witnesses:*

*McComby*  
*A. Sellers*

*Inventor:*

*George Marshall*

# United States Patent Office.

GEORGE MARSHALL, OF BROOKLYN, NEW YORK.

Letters Patent No. 80,418, dated July 28, 1868.

## IMPROVEMENT IN PUMPS.

The Schedule referred to in these Letters Patent and making part of the same.

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, GEORGE MARSHALL, of Brooklyn, in the county of Kings, and State of New York, have invented a new and useful Improvement in Pumps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification, and in which—

Figure 1 represents a front elevation of a double-acting pump constructed in accordance with my improvement, and

Figure 2 a sectional elevation of the same viewed at right angles to fig. 1.

Figure 3 is a view in perspective of one of the clamps used to secure the valve-chambers, lids, or doors, detached.

Similar letters of reference indicate corresponding parts.

In double-acting pumps, more especially those used for ships and mining purposes, among the most frequent causes of complaint are the complicated arrangement of the water-ways, and time and labor consumed in getting at the valves when, by accident, they become clogged or choked; the delay that sometimes occurs in consequence, often producing disastrous results, such as the flooding of a mine, or loss of valuable ships, lives, and cargo. To obviate these and other objections is the object of my invention, which also, by its arrangement of parts, affords the greatest facility for establishing the connection of several pumps in line on or as operated by a straight run of piston-rod, which arrangement will be found of great advantage in deep mines.

To accomplish these results, my invention consists in a combination of suction-pipe with two large and straight or free water-ways or passages, both arranged on the same side of the pump, and provided with inlet and delivery-valves, preferably covered by doors, which open directly over them, and which are fastened by clamps sliding to their place on a locking incline or wedge.

Referring to the accompanying drawing, A represents a double-acting pump-barrel, and B its reciprocating piston or plunger, to which *a* is the rod, arranged to pass through stuffing-boxes *b b*, at opposite ends of the barrel, power of any suitable description being communicated to the rod. C is the suction-pipe, arranged to communicate with a chamber, D, through which connection is established by openings *c c'*, covered (each) by a separate inlet-valve, E, with large and mainly straight water-ways F F', constructed free of objectionable projections or obstructions, and arranged both on the same side of the pump, a partition, *d*, serving to divide said water-ways that communicate at top by openings, *e e'*, with a chamber or chambers H, having a delivery-valve, G, to either water-way. Mounted on such delivery-chamber or chambers may be an air-vessel, I, provided with a general discharge-pipe, K. The barrel A communicates, at its bottom, by a passage, *f*, with the one water-way, F, or valve-chamber J, at foot of same, and at its top, by a similar passage, *g*, with the adjacent water-way F', which arrangement secures the necessary double action of the pump.

The valve-chambers formed, the one pair, J, at the foot of the water-ways, and the other, H, above them, as shown, may be covered by doors or lids L L', a single door answering for two valves. These doors are secured to their places by loose clamping-bars M M', extending across the doors, and formed with lips or ears, *h h*, that bite under inclines or wedge-shaped projections *i i'* on the outside faces of the ends of the valve chambers or boxes. It is preferable that these lids with their clamps should occupy an angular position relatively to the horizon, so that they will have no tendency to work loose, but the reverse, without, however, any risk of jamming, such position of the lids or doors presenting also a very accessible front to get at the valves when the lids are opened or removed. The position of the water-ways F F' on one and the same side of the pump, which is a convenient and compact arrangement in itself, and leaves the pump-barrel free for the piston-rod to work through both ends of it to establish connection with other pumps in line with it, largely contributes to this advantageous arrangement of the valves and their lids, and enables each of said lids to cover two valves.

By the mode of securing the lids or doors to the valve-chambers through loose clamps and fixed inclines or wedges, as described, a light tap or blow up or down on the clamps, accordingly as it is required to close or to

open or remove the lids, will suffice to lock or detach them, whereby the valves may be got at with the greatest facility and dispatch, and be again covered or shut in to re-establish the working condition of the pump.

What is here claimed, and desired to be secured by Letters Patent, is—

The combination of the water-ways F F' on one and the same side of the pump, suction-pipe C, valves E G, and valve-chambers H J, with their lids or doors L L', arranged substantially as described, loose clamping-bars M M', and fixed inclines or wedges i i', essentially as specified.

GEORGE MARSHALL.

Witnesses:

J. W. COOMBS,

A. LE CLERC.