

J. ROBERTSON.
Double Acting Pumps.

No. 154,566.

Patented Sept. 1, 1874.

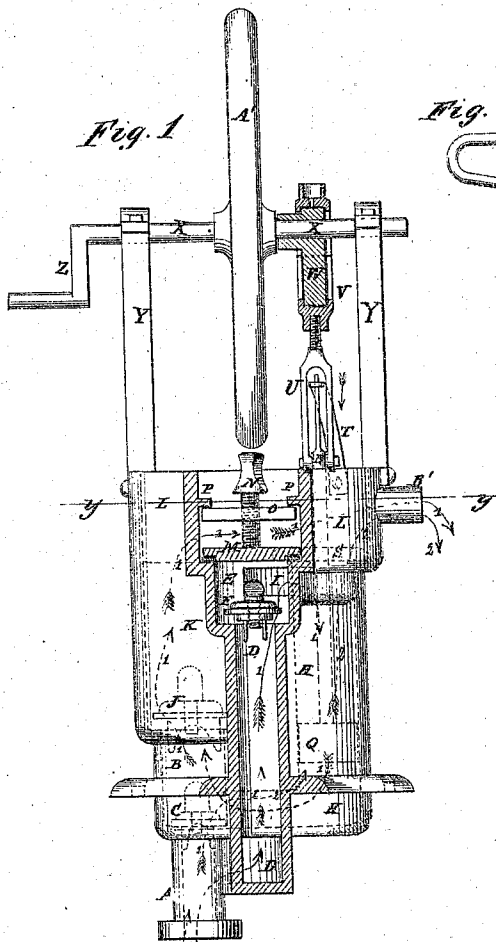


Fig. 3.

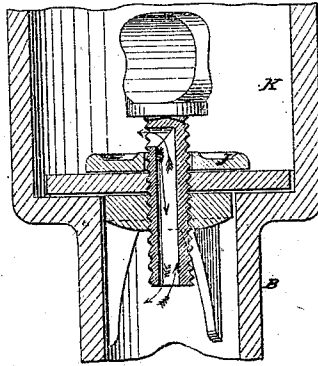


Fig. 6.

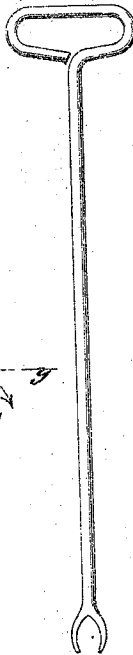


Fig. 2

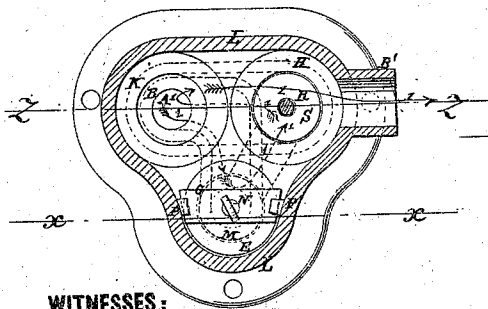


Fig. 4.

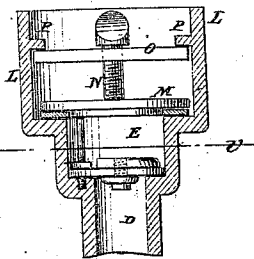
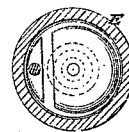


Fig. 5.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN DOUBLE-ACTING PUMPS.

Specification forming part of Letters Patent No. 154,566, dated September 1, 1874; application filed July 3, 1874.

To all whom it may concern :

Be it known that I, JAMES ROBERTSON, of the city, county, and State of New York, have invented a new and useful Improvement in Double-Acting Pump, of which the following is a specification:

Figure 1 is a front view of my improved pump, partly in section, through the line *x x*, Fig. 2. Fig. 2 is a horizontal section of the same, taken through the line *y y*, Fig. 1. Fig. 3 is a detail vertical section of one of the valves. Fig. 4 is an enlarged detail section, taken through the line *x x*, Fig. 2, showing a modified form of the valve. Fig. 5 is a detail cross-section of the same, taken through the line *v v*, Fig. 5. Fig. 6 represents a key for removing the valves.

Similar letters of reference indicate corresponding parts.

The invention relates to a double-acting pump designed especially for use on ship-board, but applicable elsewhere, or for general purposes.

The invention relates to the combination of parts, having for its general or chief object convenient access to the interior of the pump-cylinder, as and for the purposes hereinafter fully described.

A is the tube with which the pipe is connected, and which is separated from the lower valve-chamber B by a valve, C. From the tube A a passage, D, leads to the upper valve-chamber E, from which it is separated by a valve, F. From the lower valve-chamber B a passage, G, leads into the lower part of the piston-chamber H, and from the upper valve-chamber E a passage, I, leads into the upper part of the said piston-chamber H. The upper end of the lower valve-chamber B is closed by a valve, J, from which a passage, K, leads to the head L of the pump. The upper end of the upper valve-chamber E is closed by a plate, M, which is held down to its seat by a screw, N, which passes through a screw-hole in the bar O, the ends of which are placed beneath lugs P cast upon the head L. Q is the piston, the rod R of which passes up through the plate S, which rests upon the upper end of the piston-chamber H, and serves as a discharge-valve to said chamber. The piston-rod R works in guide T, and has an

eccentric connection, V W, with the crank-shaft X Z, which carries a balance-wheel, A'.

The movements of the water caused by the downward movements of the piston are indicated by arrows marked 1.

As the piston Q moves upward, a vacuum is formed in the chamber B, which causes the water to pass up through the passage A, raise the valve C, pass into the chamber B, and thence through the passage G into the lower part of the piston-chamber H, to be forced out by the next downward movement of the piston. The same upward movement of the piston forces the water in the upper part of the piston-chamber to raise the plate or valve S, pass into the head L, and flow out through the spout B'.

The movements of the water caused by the upward movement of the piston Q are indicated by arrows 2.

The valves C F J may all be drop-valves, as shown in Figs. 1, 4; or, if desired, the valve F may be a clack-valve, as shown in Figs. 5, 6, which offers less obstruction to pieces of wood or other rubbish which may enter the pump with the water. In this case the valve should be hinged to a short rod the lower end of which rests in a socket formed to receive it in the valve-seat, and which is held in place by the plate M, which rests upon its upper end, as shown in Fig. 5.

By this arrangement the valve F can be taken out to remove any rubbish that may be in the passage D without stopping the pump, which will then act as a single-acting pump. This arrangement also enables the discharge-valve J and the lower suction-valve C to be readily taken out to remove any rubbish that may be in the passages B A. The passages K B A being in a vertical line, enables a tool to be inserted into the pipe for the removal of any rubbish there may be in said pipe.

To enable the valves to be easily raised, I adopt a construction found in certain air-pumps—to wit: The screw of each valve is perforated from its forward or upper end nearly to its shoulder, and a cross-perforation is found leading out through the side of the screw.

Thus, when the valve is to be taken out, one or two turns of the screw will uncover

the perforation, as shown in Fig. 4, and allow air to pass in beneath the valve and destroy the vacuum which forms beneath it at such times.

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

The combination of the plate M, locking-

screw N, cross-bar O, and lugs P with the upper valve-chamber E and the head L of the pump, substantially as herein shown and described.

JAMES ROBERTSON.

Witnesses:

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