

(No Model.)

A. F. ABRAHAMSON.
RECIPROCATING PUMP.

No. 471,411.

Patented Mar. 22, 1892.

Fig. 1.

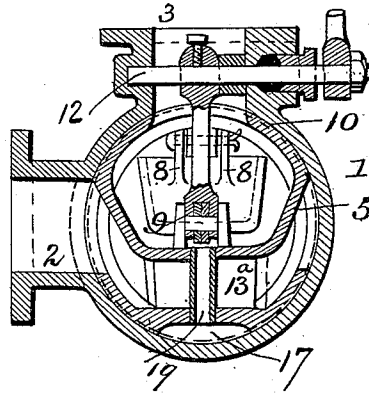
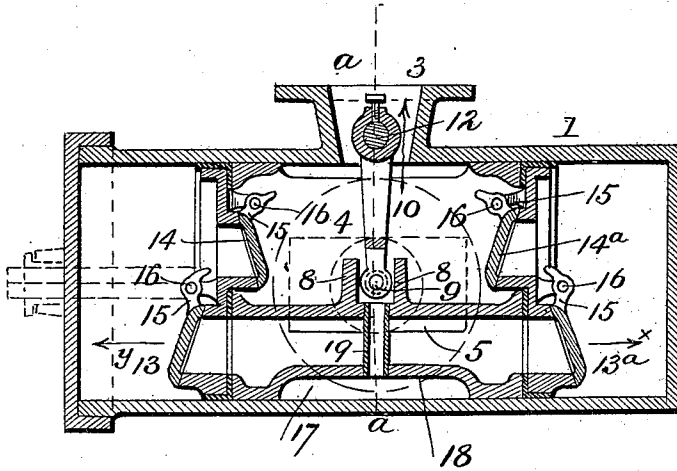


Fig. 2.

WITNESSES:

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UNITED STATES PATENT OFFICE.

AXEL FREDRIK ABRAHAMSON, OF MADRID, SPAIN.

RECIPROCATING PUMP.

SPECIFICATION forming part of Letters Patent No. 471,411, dated March 22, 1892.

Application filed April 14, 1891. Serial No. 388,957. (No model.)

To all whom it may concern:

Be it known that I, AXEL FREDRIK ABRAHAMSON, mechanical engineer, a subject of the King of Sweden, residing at Madrid, Spain, have invented certain new and useful Improvements in Reciprocating Pumps; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in pumps of that class known as "reciprocating pumps," in which the piston or embolus works in a cylinder which is provided with inlet and outlet ports.

The object of this invention is to provide an improved pump of this character in which all the valves are carried by the reciprocating piston or embolus, whereby superior results are attained with respect to simplicity and economy in construction and efficiency in operation.

The invention consists in the novel construction and combination of parts herein-after fully described, and specifically pointed out in the claim.

In the accompanying drawings, Figure 1 is a central longitudinal sectional view of a double-acting lift and force pump constructed in accordance with my invention. Fig. 2 is a cross-section on the line *aa*, Fig. 1.

In the said drawings the numeral 1 designates the pump-cylinder, having inlet-port 2 and outlet-port 3. Within this cylinder works the reciprocating piston or embolus 4, consisting of a cylinder divided by means of a partition 5 into two chambers 6 and 7, the former of which communicates with inlet 2, while the latter communicates with the outlet-port. At or near its center the partition is provided with two upwardly-projecting lugs 8, which embrace a roller 9, carried by the lower end of a crank-arm 10, depending from an oscillating shaft 12, journaled in the wall of the outlet-port 3. When the rod 12 is oscillated, the piston or embolus will be reciprocated in the cylinder 1 through the medium of the arm 10 and the roller 9, the latter alternately striking one of the lugs 8. At each end the chambers 6 and 7 of the piston are provided with valve-openings and valves 13 13^a and 14 14^a, the valves 13 13^a working outwardly,

while valves 14 14^a work inwardly. These valves are provided with shanks 15, which are pivoted in lugs 16 formed on the piston-heads. Diametrically opposite the outlet-port the periphery of the piston is cut away or formed with a recess 17, which in connection with the cylinder forms a chamber 18, which at its center is provided with a pipe or tube 19, passing through the partition and communicating with the chamber 7, whereby a portion of the water from said chamber is forced into the chamber 18, and serves to counterbalance the pressure in the piston or embolus. By this means there will be no liability of the side of the piston opposite the outlet-chamber binding against the cylinder, caused by the pressure in said chamber, as said pressure will be counteracted and equalized by the pressure in chamber 18.

The operation is as follows: The piston being reciprocated, say, in the direction of the arrow *x*, the water will be drawn in through inlet 2 into chamber 6 and will escape through valve 13 into the space in that end of the cylinder. Upon the return movement of the piston in the direction shown by arms *y*, valve 13 will close, and valve 14 of chamber 7 will open, allowing the water to enter said chamber. At the same time valve 13^a will open, allowing the water from chamber 6 to enter the space in that end of the cylinder. Upon the piston again reversing its movement, valves 13 and 14^a will open and valves 14 and 13^a will close. As before stated, a portion of the water in chamber 7 will be forced into chamber 18, counterbalancing the pressure in the piston.

Having thus described my invention, what I claim is—

In a pump, the combination, with a cylinder having inlet and outlet ports, of a piston or embolus reciprocating in said cylinder, provided with inlet and outlet chambers and valves having a peripheral chamber diametrically opposite the outlet-port of the cylinder, and a passage connecting said chamber with the outlet-chamber of the piston, substantially as described.

In testimony whereof I have hereunto subscribed my hand in the presence of the two subscribing witnesses.

AXEL FREDRIK ABRAHAMSON,

Witnesses:

JNO. B. MARIE,
JOSE CADA.