(No Model.)

A. F. ABRAHAMSON.

PUMP.

No. 553,381. Patented Jan. 21, 1896.

Fig. 1.

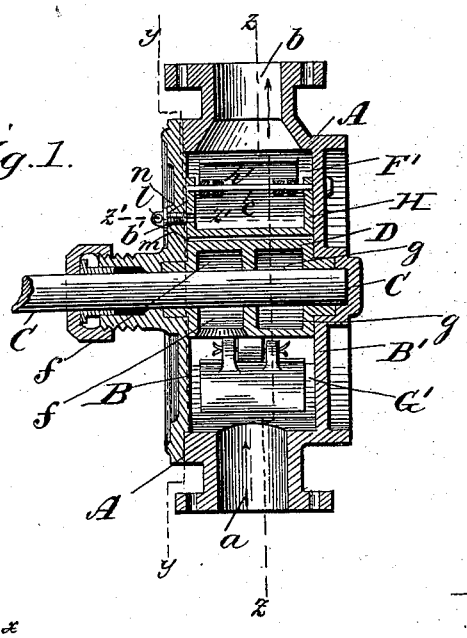


Fig. 2.

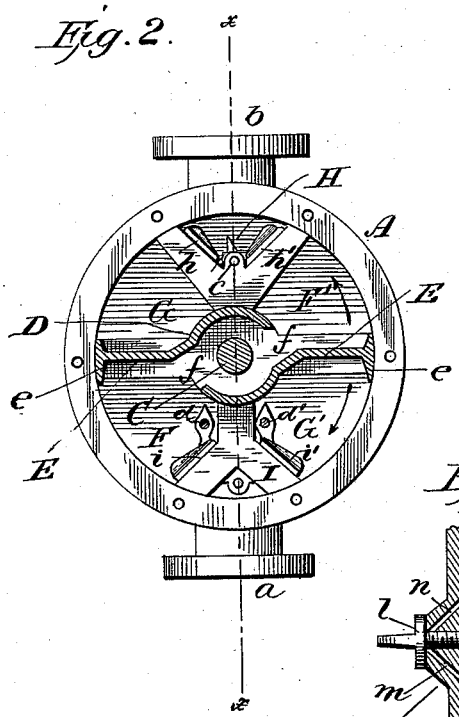


Fig. 3

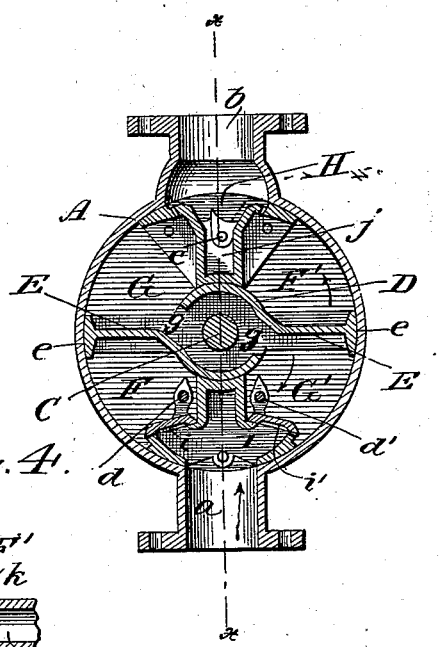
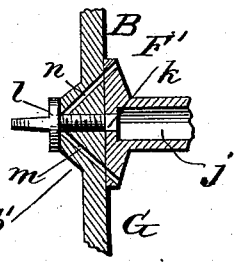


Fig. 4.



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UNITED STATES PATENT OFFICE.

AXEL FREDRIK ABRAHAMSON, OF MADRID, SPAIN.

PUMP.

SPECIFICATION forming part of Letters Patent No. 553,381, dated January 21, 1896.

Application filed March 9, 1895. Serial No. 541,159. (No model.) Patented in France January 25, 1895, No. 242,177, and in Germany April 19, 1895, No. 80,775.

To all whom it may concern:

Be it known that I, AXEL FREDRIK ABRAHAMSON, a subject of His Majesty the King of Sweden and Norway, and a resident of the city of Madrid, in the Kingdom of Spain, have invented certain new and useful Improvements in Pumps, (for which I have obtained Letters Patent of Germany, No. 80,775, dated April 19, 1895, and of France, No. 242,177, dated January 25, 1895;) 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, and in which—

Figure 1 is a central sectional view of my improved oscillating pump on the transverse vertical plane indicated by the broken line marked *x x* in Figs. 2 and 3. Fig. 2 is a longitudinal sectional view of the same on the vertical planes indicated by the broken line marked *y y* in Fig. 1. Fig. 3 is also a longitudinal sectional view at right angles to the axis of the pump on the parallel planes indicated by the broken line marked *z z* in Fig. 1; and Fig. 4 is a sectional detail view, on an enlarged scale, of the upper stationary valve-seat on the horizontal plane indicated by the short broken line marked *z' z'*, showing more clearly the construction and arrangement of the ducts for relieving the pump chambers and valves from sand and sediment that may have lodged therein.

Like letters of reference designate corresponding parts in all the figures.

My invention relates to improvements in oscillating pumps, or pumps of that class in which an oscillating shaft is journaled centrally in a cylindrical casing provided with inlet (suction) and outlet (delivery) ports, and corresponding suction and delivery pipes, said casing being provided with interior radial partitions, while the oscillating shaft has a hub provided with radial wings or pistons extending to and bearing with their free ends against the interior circular wall of the cylindrical casing; and my improvement consists in the novel and peculiar construction and arrangement of the suction and delivery chambers and their appropriate valves, as also of the oscillating hub and the water-passages made therein, whereby I produce a "quadruple" pump having two separate suction-chambers and two delivery-chambers in place of a single suction-chamber and single delivery-chamber, as in the pump described and claimed by me in my Letters Patent of the United States No. 472,156, granted to me on the 5th day of April, 1892, on which my present invention constitutes an important improvement, inasmuch as a pump of my improved quadruple type will deliver twice as much water in a given time as a pump of the same dimensions constructed according to the old or "double-acting" plan, as described and claimed in my patent hereinbefore referred to.

On the accompanying drawings, the reference-letter A denotes the circular rim of the exterior cylindrical casing, and B B' the ends or heads of my improved oscillating pump. Journaled centrally in these parallel circular heads is a shaft C, the bearings of which are provided with the usual packing and stuffing boxes, and which may be oscillated by any suitable means, either by hand or power, as is usual in this class of pumps.

Mounted upon or formed in one piece with the shaft C is a hub D, having radial wings E E, the T-shaped ends or heads *e e* of which bear water-tight against the smooth inner wall of the pump-casing. This hub is also provided with two oblique water-passages *f f* and *g g*, which cross but are independent of each other, and connect, respectively, the interior chambers or compartments F F' and G G', which are formed within the pump-casing by the two rigidly-inserted valve-seats H and I.

The upper valve-seat, H, is of a V shape, and faces with its broad open end the delivery-pipe *b*, while its lower end is ground off or concaved to fit the hub D. The lower valve-seat, I, is of the shape of an inverted Y, with its broad open end facing the suction-pipe *a*, while its stem is ground off concavely to fit the opposite side of hub D. The upper valve-seat, H, is fitted with two valves *h* and *h'*, hinged upon a common fulcrum-pin *c* in the crotch of the V, and the lower valve-seat, I, is similarly fitted with two valves *i* and *i'*, which swing upon separate fulcrum-pins *d*

and d', inserted through ears which project laterally from opposite sides of the stem.

The hollow interior of the upper valve-seat, H, forms a small compartment j, intermediate between the larger side compartments G and F', and opening to the outside through a short passage k bored through the casing-head B, which is normally closed by a headed screw-stopper l. In order to form a proper support or bearing for this stopper l, the casing B is at this point thickened or reinforced by a boss b', and converging in the mouth of the outlet k, so as to be closed by the same stopper-head, are two oblique passages m and n, which communicate, respectively, with the interior chambers G and F' on opposite sides of the valve-seat. As the chamber G communicates with chamber G' through the hub-passage g, while the opposite chamber F' similarly communicates with chamber F through the hub-passage f, it follows that all four compartments, as well as the interior of the stationary valve-seats, may be opened to the outside through the ducts k, m and n simply by removing the headed screw-stopper l, so that all sand and other impurities that collect and find lodgment in the pump-chambers and valve-seats may be expelled, and the whole interior of the pump thoroughly flushed and washed out by removing the stopper l and working the pump-handle forward and back so as to oscillate the central shaft with its pistons in alternately opposite directions. As most of the sand, grit, and similar heavy impurities contained in the water passing through the pump will find a lodgment in the upper valve-seat, H, the interior chamber j of this can be flushed by pumping the whole length of the delivery-pipe full of water, and then opening the outlet k, when the head of water in the delivery-pipe will run down and out through the valve-chamber j and outlet k, thus thoroughly flushing and rinsing it out.

My improved pump possesses many important advantages over ordinary double-acting force-pumps with a vertically-reciprocating piston or plunger, among which may be mentioned the following, viz: considerably less friction between the wing-pistons and interior of the pump-casing. The wing-pistons are "water-packed" and "balanced" on opposite sides of the central hub, and require no expensive destructible leather or rubber packing. Sand and other impurities contained in the water will not affect the pump injuriously, and can easily be removed by the means hereinbefore described. By centrally pivoting the wing-pistons I obtain an increased amount of leverage for working the pump, so that it will require a great deal less power to operate one of my improved pumps than an ordinary vertically-reciprocating double-acting force-pump of the same capacity. Again, the water-pressure in operating my pump is always equally distributed on both sides of the pump, thus necessarily maintaining perfect equilibrium of both pistons, which results in a perfectly-balanced pump, with the well-known advantages of that construction. All of these important advantages are shared, however, to a greater or lesser extent, by my double-acting oscillating pump patented April 5, 1892; but an important advantage of my improved quadruple pump, hereinbefore described, over my old double-acting pump is its much greater capacity, resulting from constructing it with four separate pump-chambers connected in pairs by water-passages through the central oscillating hub, instead of two, whereby I double its capacity—*i. e.*, deliver twice as much water within a given period of time as with a pump of my old construction.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

In an oscillating pump of the described type, the combination with the vertical discharge-pipe b, valve-chamber j in alignment therewith, and pump-chambers G, F', on opposite sides of said valve chamber, of the obliquely-apertured casing-head B having boss b' and provided with the slanting and converging ducts m and n intersecting the central outlet of valve-chamber j; substantially as and for the purpose shown and set forth.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

AXEL FREDRIK ABRAHAMSON.

Witnesses:
ERIK WALÉN,
AXEL STEEN.