

No. 749,248.

PATENTED JAN. 12, 1904.

J. WILLMANN.

PUMP.

APPLICATION FILED JULY 16, 1903.

NO MODEL.

Fig. 1.

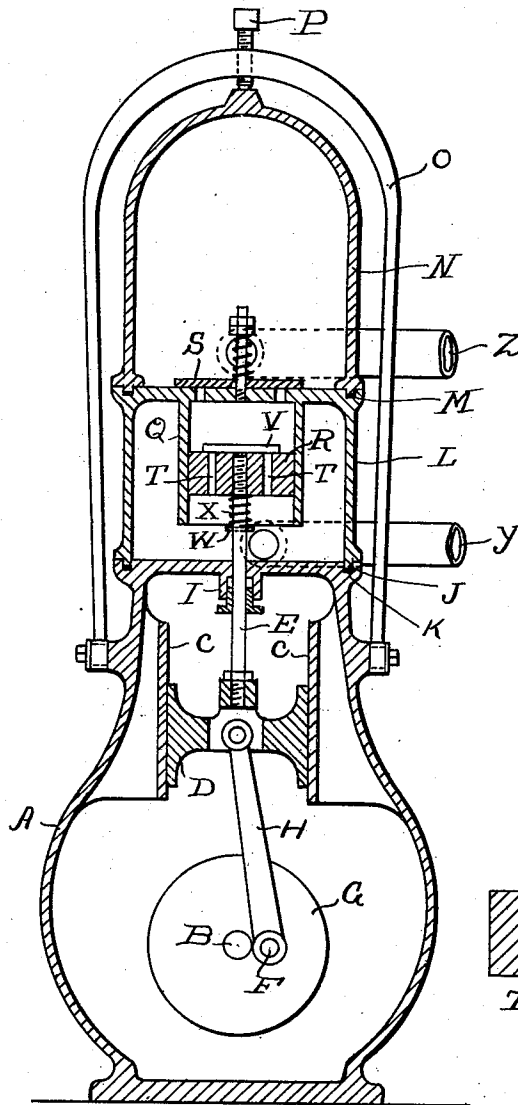
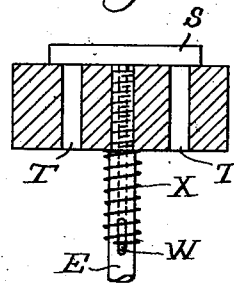


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOSEPH WILLMANN, OF CHICAGO, ILLINOIS.

PUMP.

SPECIFICATION forming part of Letters Patent No. 749,248, dated January 12, 1904.

Application filed July 16, 1903. Serial No. 165,886. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH WILLMANN, a citizen of Germany, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Pumps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to a novel construction in a pump, the object being to produce a high-speed pump in which all pounding is obviated and which has a very high efficiency; and it consists in the features of construction and combinations of parts hereinafter fully described and claimed.

The accompanying drawings illustrate my invention.

Figure 1 shows my pump in central vertical section. Fig. 2 is an enlarged detail view of one of the valves.

The object of the present invention is not only to produce a pump of very simple construction and high efficiency, but also to so construct the same as to render every part thereof very easily accessible for purposes of cleaning and repairing, and to render assembling of the parts very easy.

To these and other ends my pump consists of a hollow base A, preferably of cast-iron, which is enlarged adjacent its lower end and in which a crank-shaft B is journaled. Adjacent its upper end said base is provided with parallel vertical guides C, on which the cross-head D of the piston-rod E moves, said cross-head being connected with the crank-pin F of a disk G by means of the pitman H. The upper wall of said base A is flat and is provided with a central opening through which the piston-rod E passes, a fluid-tight joint being formed in the usual manner by means of the stuffing-box I. In the upper face of said upper wall adjacent the edge thereof is an annular groove J, adapted to receive a suitable packing K and in which the lower edge of a cylinder L fits, the latter open at its lower end and closed at its upper end, the upper wall thereof being likewise provided with an annular groove M, which receives the lower end

of a dome N, said dome and cylinder L being held in relative position upon said base A by means of an inverted-U-shaped loop O, preferably pivotally secured at its free ends to opposite sides of said base A and carrying a set-screw P at its middle portion which bears upon the upper end of said dome N. On the upper wall of said cylinder L is a concentric downwardly-extending annular flange Q which forms the pump-cylinder, the piston R entering same at its lower end. In said upper wall within said cylinder Q are a plurality of exhaust-ports which are controlled by a spring-actuated check-valve S, resting upon the upper wall of said cylinder L. The said piston R is provided with a plurality of inlet-ports T, which are controlled by the spring-actuated valve V, the stem of which is preferably passed downwardly through the center of said piston and into the hollow upper end of said piston-rod E, the latter being provided with longitudinal slots through which the cross-head W of the valve-stem projects, a spring X being interposed between said cross-head and the lower face of said piston. A supply-pipe Y enters said cylinder L adjacent its lower end, and an exhaust-pipe Z enters the lower end of said dome N.

In operation my pump is very simple; but its efficiency has been proven to be unusually great by reason of the fact that when the piston reaches the upper limit of its stroke when it is very close to the upper wall the sudden downward movement due to its high speed causes the suction-valves to remain practically stationary while the piston moves away from same, thereby causing the inlet-ports to be immediately opened wide and permitting free access to the fluid, said suction-valve following said cylinder and closing just when the latter begins its upward stroke. In this way the pounding due to too sudden closing of the suction-valve is entirely avoided, and the effect is such that when said pump is operated at the rate of five hundred strokes a minute there is no perceptible vibration, and by placing the hand on either of the pipes Y or Z the vibration cannot be felt.

It has been determined by experiment that in pumps the greatest efficiency is attained

when the inlet and exhaust valves are placed very close together, as they obviously are in this instance. All pounding is further avoided by the large air-space in the dome and in the cylinder L around said flange Q.

In order to clean or repair my pump, all parts are rendered very easily accessible, as by disconnecting the pipes Y and Z and releasing the loop O the dome can be removed, and thereby the check-valve exposed, and by removing the cylinder L the suction-valve and piston are exposed.

My said pump, besides being adaptable for all purposes where a large quantity of water or other fluid at comparatively low pressure is required, is particularly adapted for pumping such fluids as milk or other substances which are of a nature to readily spoil, and hence require that the pump should be thoroughly cleaned at frequent intervals, the ready accessibility of all parts being very essential in this class of service.

I claim as my invention—

1. In a pump, the combination with a base, and a reciprocating piston movably mounted therein and projecting from same, of a suction-chamber mounted on said base, a pressure-chamber mounted on said suction-chamber, devices on said base engaging said pressure-chamber for securing the latter and said suction-chamber thereto, a cylinder in said suction-chamber adapted to receive said piston, valve-controlled inlet-ports in said piston, and valve-controlled exhaust-ports establishing communication between said cylinder and said pressure-chamber.

2. In a pump, the combination with a base and a reciprocating piston movably mounted on said base and projecting beyond the same, of a suction-chamber mounted on said base, a cylinder carried by said suction-chamber adapted to receive said piston, valve-controlled inlet-ports in said piston, a pressure-chamber mounted on said suction-chamber, and valve-controlled exhaust-ports establishing communication between said cylinder and said pressure-chamber.

3. In a pump, the combination with a hollow base closed at its upper end, a reciprocating piston-rod passing through the upper wall thereof and receiving its motion from a crank-shaft in said base, and a piston mounted on the outer end of said piston-rod, on an annular groove in the upper wall of said base, a suction-chamber open at its lower end adapted to enter said groove at its lower end, a cylinder within said suction-chamber adapted to receive said piston and forming the pump-cylinder, an annular groove in the upper wall of said suction-chamber, a pressure-chamber

open at its lower end and adapted to enter said last-named groove at said lower end, a U-shaped arm secured at its free ends to said base and overhanging said dome, and compression devices carried by said arm and acting on said dome for holding same and said suction-chamber in place on said base.

4. In a pump, the combination with a base and a tension member carried thereby, of a suction-chamber mounted on said base, a pressure-chamber mounted on said suction-chamber and engaged by said tension member to hold same on said suction-chamber and to hold the latter on said base, a pump-cylinder carried by said suction-chamber, a piston movably mounted in said base and entering said pump-cylinder, and means carried by said base for imparting motion to said piston.

5. In a pump, the combination with a base, two superimposed vessels mounted on said base, and valve-controlled openings establishing communication between said vessels, of an annular depending flange on the upper wall of the lowermost vessel, a piston movable therein, means carried by said base and connected with said piston for imparting motion thereto, valve-controlled openings in said piston, an inlet-pipe entering said lowermost vessel, and an outlet-pipe entering said uppermost vessel.

6. In a device of the kind specified, the combination with a plurality of separable members, of a pump-cylinder carried by one of said members, a reciprocating piston carried by another of said members and entering said cylinder, inlet-ports in said piston, a valve controlling same, exhaust-ports establishing communication between said cylinder and the third member, a valve controlling said exhaust-ports, and a tension device engaging the two outermost members for securing same to the intermediate member.

7. In a device of the kind specified, the combination with a base, a reciprocating piston carried thereby, and a fluid-pressure chamber, of a suction-chamber interposed between said base and pressure-chamber, a cylinder in said suction-chamber receiving said piston, inlet-ports in said piston, exhaust-ports establishing communication between said cylinder and said fluid-pressure chamber, valves controlling said ports, and a member mounted on said base and spanning said fluid-chamber for holding same and said suction-chamber firmly on said base.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH WILLMANN.

Witnesses:

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