F. O. Deschamps,

Rotary Pump.

No. 112,429 Patented Mar. 7, 1871.

FIG. 1.

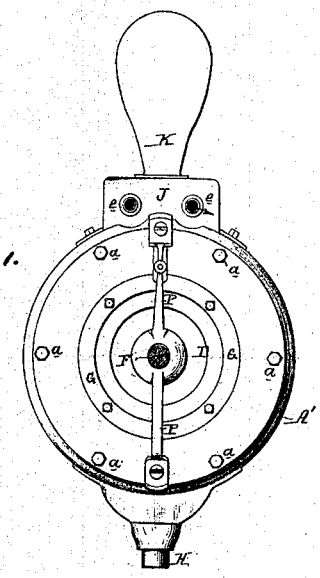


FIG. 2.

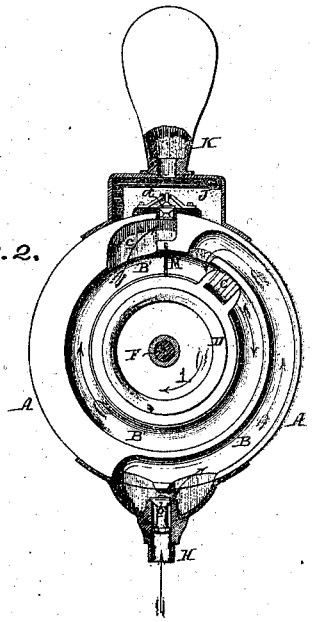


FIG. 3.

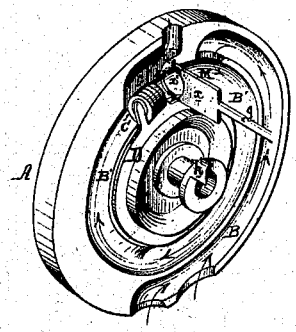


FIG. 4.

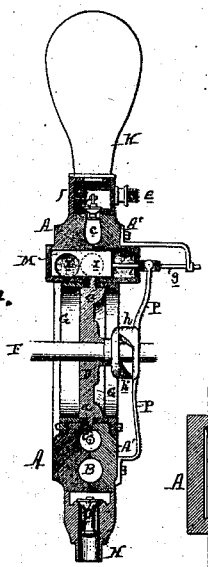
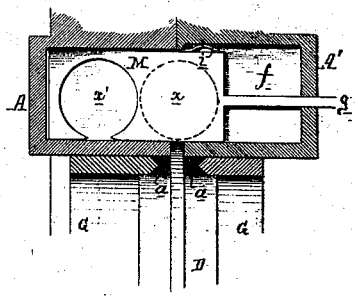


FIG. 5.



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FRANCIS OLIVER DESCHAMPS, OF PHILADELPHIA, PENNSYLVANIA.

Letters Patent No. 112,429, dated March 7, 1871.

IMPROVEMENT IN ROTARY PUMPS.

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

I, FRANCIS OLIVER DESCHAMPS, of Philadelphia, county of Philadelphia, State of Pennsylvania, have invented an Improved Rotary Pump, of which the following is a specification.

Nature and Object of the Invention.

My invention consists of a rotary pump, the principal features of which are an annular chamber, a piston adapted to the same and connected to a shaft arranged to revolve concentrically as regards the chamber, a sliding head to move across or recede from the said chamber, and suction and discharge-valves and passages, all being constructed and arranged as fully described hereafter.

Description of the Accompanying Drawing.

Figure 1 is an exterior view of my improved rotary pump;

Figure 2, a view of the same partly in section, and with one-half of the casing removed;

Figure 3, a perspective view of part of fig. 2, showing the working parts in a different position;

Figure 4, a transverse vertical section of the pump on the line 1–2, fig. 1; and

Figure 5, a detached view of part of fig. 4, drawn to an enlarged scale.

General Description.

The casing of the pump consists of two circular plates, A and A′, of cast metal, secured together by bolts, *a*, and having formed between them, half in one plate and half in the other, a semicircular passage, B, and an annular chamber, B′, in which slides a piston, C, attached to the edge of a disk, D, which is hung to the driving-shaft F.

The casing of the pump can be cast with a base, or it may be secured to any suitable stand or frame, on which can also be formed bearings for the driving-shaft F.

The piston C consists of a number of independent rings or disks strung upon a rod, as fully described in my application for a patent for a steam-engine, the object of which arrangement is to enable the said piston to accommodate itself to the annular chamber in which it slides, and thus prevent leakage.

Leakage from the annular chamber around the edge of the disk D, to which the piston is attached, is also prevented in a manner similar to that described in my said application for a steam-engine, by adjustable rings, G G, having Y-shaped edges, which force rubber or other suitable packing, *a a*, into the space between the said disk and the recess communicating with the annular chamber.

The semicircular passage B in the casing communicates freely at its upper end with the interior of the annular chamber B′, and at its lower end with a branch, H, furnished with a poppet-valve, *b*, opening upward; and the said annular chamber communicates, through a passage, *c*, with a chamber, J, formed in a box secured to or forming part of the casing of the pump.

At the entrance of the chamber J there is a poppet-valve, *d*, opening upward, and the said chamber has one or more outlet-openings, *e*, and communicates at the top with the interior of an air-chamber, K.

The upper portion of the casing of the pump is enlarged, as best observed in figs. 4 and 5, so as to form a narrow elongated recess, *f*, for the reception of a sliding head or valve, M, which extends transversely across the annular chamber B′, as shown in figs. 2 and 3. This sliding head or valve has a solid portion, *x*, which, when brought opposite the annular chamber, forms a head or partition across the same; and it has also an opening, *x′*, through which, when it is brought opposite the said chamber, the piston C can freely pass. In some cases, however, the opening *x′* in the sliding head might be dispensed with and the said head be reduced in length, so as to enable it to be entirely withdrawn from the annular chamber in order to permit the passage of the piston.

The sliding head is provided with a rod, *g*, which is connected to one end of a spring-bar, P, secured at its opposite end to the pump-casing. This spring-bar has an inclined projection, *h′*, of the shaft F, in such a manner as to cause the said spring-bar to be pushed outward, and the sliding head to be consequently drawn back or opened, as shown in fig. 3; and the said inclined projection and cam are of such a shape as to permit the bar, after the passage of the cam, to spring suddenly inward, and thus close the head or valve, as shown in fig. 4.

A spring, *i*, fig. 5, secured to the casing, acts constantly on the upper edge of the sliding head and forces the latter downward, and this prevents any leakage beneath the lower edge of the same.

When the shaft F, disk D, and piston C are turned in the direction of the arrow 1, fig. 2, the head M being closed, the suction-valve *b* will be raised from its seat and the water or other fluid to be pumped will pass through the branch H and semicircular passage B into the chamber B′, behind the piston and between the latter and the sliding head. At the same time the water in front of the piston within the annular chamber will be forced through the passage *c* and beneath the discharge-valve *d* into the chamber J, and thence through the outlet-branches *e e*.

As the piston approaches the sliding head the latter will be drawn back, as shown in fig. 3, so that it may not be struck by the piston, and after the passage of the latter the head will be closed suddenly, as above described, and another volume of water will be forced

through the annular chamber and passage *c* to the point of discharge, as before, the operation being continued uninterruptedly so long as the shaft F is revolved, as the suction and discharge-valves *b* and *d* prevent the return of any fluid from either the passages B or chamber J.

Claims.

1. A pump, in which are combined the following features, namely, an annular chamber, a piston adapted to the same and connected to a shaft arranged to revolve concentrically as regards the chamber, a sliding head to move across or recede from the said chamber, and suction and discharge-valves and passages, all being arranged substantially as described.

2. In a pump, the sliding head M, adapted to a recess, *f*, in the casing, and operated by a rod, *g*, or its equivalent, in such a manner that it shall be caused to move across and recede from the annular chamber B′, as set forth.

3. The said sliding head, when operated by a cam, *h*′, on the driving-shaft, through the medium of a spring-bar, P, and rod *g*, substantially in the manner described.

4. The combination and arrangement, substantially as described, of the inlet-branch H, semicircular passage B, annular chamber B′, through which a piston traverses in one direction, and outlet-passage C.

5. The casing of the pump, consisting of plates A and A′, bolted or otherwise secured together, and having formed between them the semicircular passage B, annular chamber B′ communicating with the same, and recess for securing the edges of the disk G.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

F. O. DESCHAMPS.

Witnesses:

WM. A. STEEL,

HARRY SMITH.