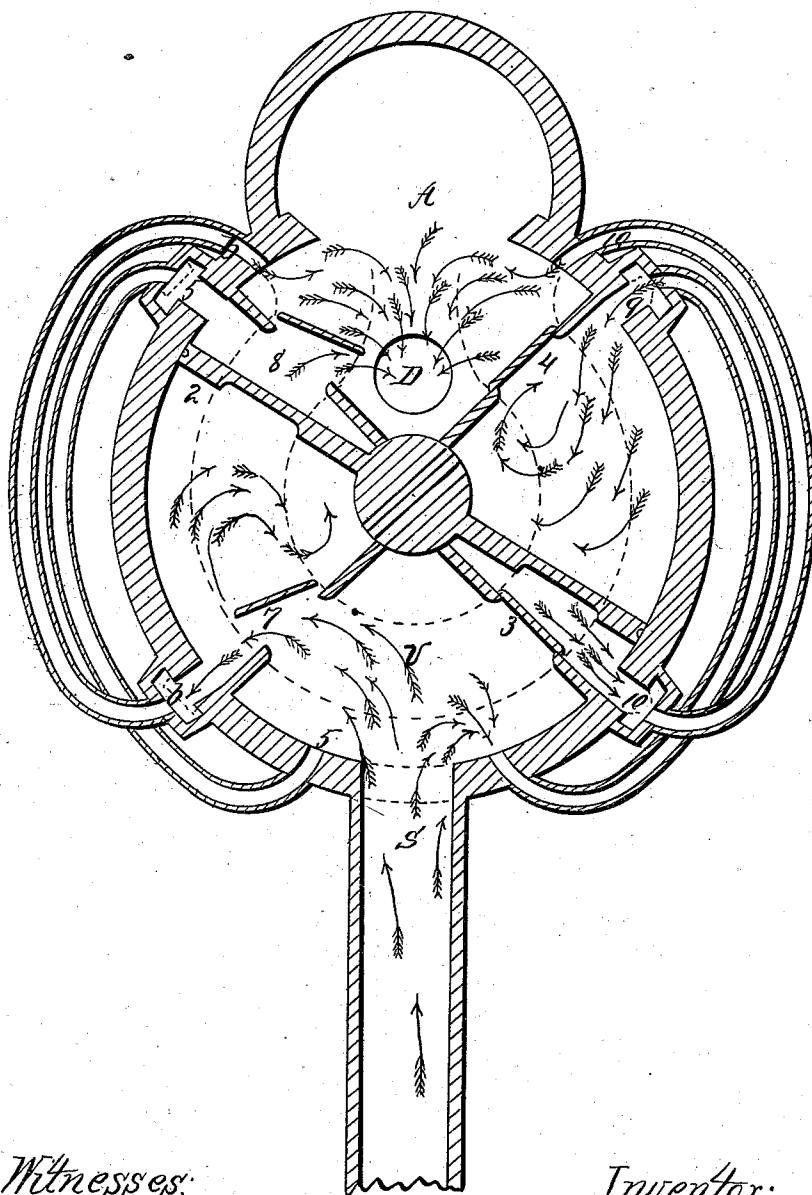


E. Lawrence & R. Safley 2nd
Oscillating Pump,
N^o 23,094. Patented Mar. 1, 1859.



Witnesses;

L. C. Artman
E. C. Lawrence

Inventor;

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Robert Safley 2nd

UNITED STATES PATENT OFFICE.

EDWIN LAWRENCE AND ROBERT SAFLEY, 2D, OF WATERFORD, NEW YORK.

PUMP.

Specification of Letters Patent No. 23,094, dated March 1, 1859.

To all whom it may concern:

Be it known that we, EDWIN LAWRENCE and ROBERT SAFLEY, 2d, of Waterford, in the county of Saratoga and State of New York, have invented a new and useful machine designed for the purpose of raising and propelling water, and to be used for fire-engines, marine and force pumps, and for other purposes; and we do hereby declare that the following is a full and exact description.

The nature of our invention consists of a circular, reciprocating, double acting pump, in which the reciprocating motion is obtained by the movement of the arms, or piston, upward and downward, simultaneously, on opposite sides of the cylinder, through a space less than that of the whole circle, and in which the double action is obtained by the same motion of the arms, or piston, in conjunction with valves affixed to the outer surface of the cylinder as well as to the partitions, inside, in connection with pipes, or water-ways outside of it, by means of all which, water is both raised and propelled on both sides of the cylinder, at one and the same time, and by the same motion of the arms, or piston.

To enable others skilled in the art to make and use our invention we will proceed to describe its construction and mode of operation:—The cylinder is composed of Lawton's anti-friction metal, and may be composed of other metals and alloys, and is cast of such thickness as strength and durability require, the diameter and length being determined by the capacity desired to be obtained, and for service, one (or more if required), is securely fastened, by flanges, or otherwise, in a wooden, or metal box, or tub, or frame. The arms, or piston, is fitted to move within the segment of a circle, inside the cylinder, and is provided with packing composed of Lawton's metal, wood saturated with oil, leather, hemp, or other suitable material. The arms, or piston, is secured to a shaft passing through the center of the cylinder, the latter being made tight where the shaft passes through the heads, by means of stuffing boxes, upon the shaft, and secured to the cylinder-heads.

The pump may be operated by means of brakes and the rock-shaft, ordinarily used upon fire engines, and in other ways adapted to circumstances and the purpose to which it is to be applied.

The operation of the pump may be described as follows, reference being had to the accompanying drawings, representing an end-view of the interior of the pump, the several parts being designated by letters and figures, reference being had also to the model.

S, is the suction hose leading to the water.

V, is the vacuum-chamber.

A, is the air-chamber, and D, is the outlet, or discharge-opening.

The vacuum and air-chambers are designed to furnish a sufficient supply of air to give steadiness and regularity to the ingress and egress of water to and from the pump.

When the arm 1 is elevated, water is raised, by suction, through the suction hose into the vacuum-chamber and out of it through the aperture covered with the valve 3, and by the same upward movement of the arm, water is propelled, by pressure, through the aperture covered with the valve 4 into the air-chamber and out through the discharge-opening; while, by the simultaneous downward movement of the arm 2, water is raised, by suction, through the suction-hose and pipe and valve 5, and by the same downward movement of the arm, water is propelled, by pressure, through the valve and pipe 6, into the air-chamber and out through the discharge-opening.

When the arm 2, is elevated, water is raised, by suction, through the suction hose into the vacuum-chamber and out through the aperture covered with the valve 7, and by the same upward movement of the arm, water is propelled, by pressure, through the aperture covered with the valve 8, into the air-chamber and out through the discharge-opening,—while, by the simultaneous downward movement of the arm 1, water is raised, by suction, through the suction-hose and through the pipe and valve 9, and by the same downward movement of the arm, water is propelled, by pressure, through the valve and pipe 10, into the air-chamber and out through the discharge-opening. More than one discharge-opening may be used, if necessary.

We do not claim as our invention a pump with arms passing through the shaft, and working in the segment of a circle, inside of a circular metal box, flattened at the top and bottom, and squeezing the water between partitions at the sides, and out at the

top, as in the old Rogers patent pump, which raised water on one side while it was expelled on the other.

What we claim as our invention, and desire to secure by Letters Patent, is—

A circular, reciprocating, double-acting pump, that will both raise and propel water on both sides of the cylinder, at one and

the same time, and by the same motion of the arms, or piston, substantially as herein- 10
before set forth.

EDWIN LAWRENCE.

ROBERT SAFLEY, 2ND.

Witnesses:

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