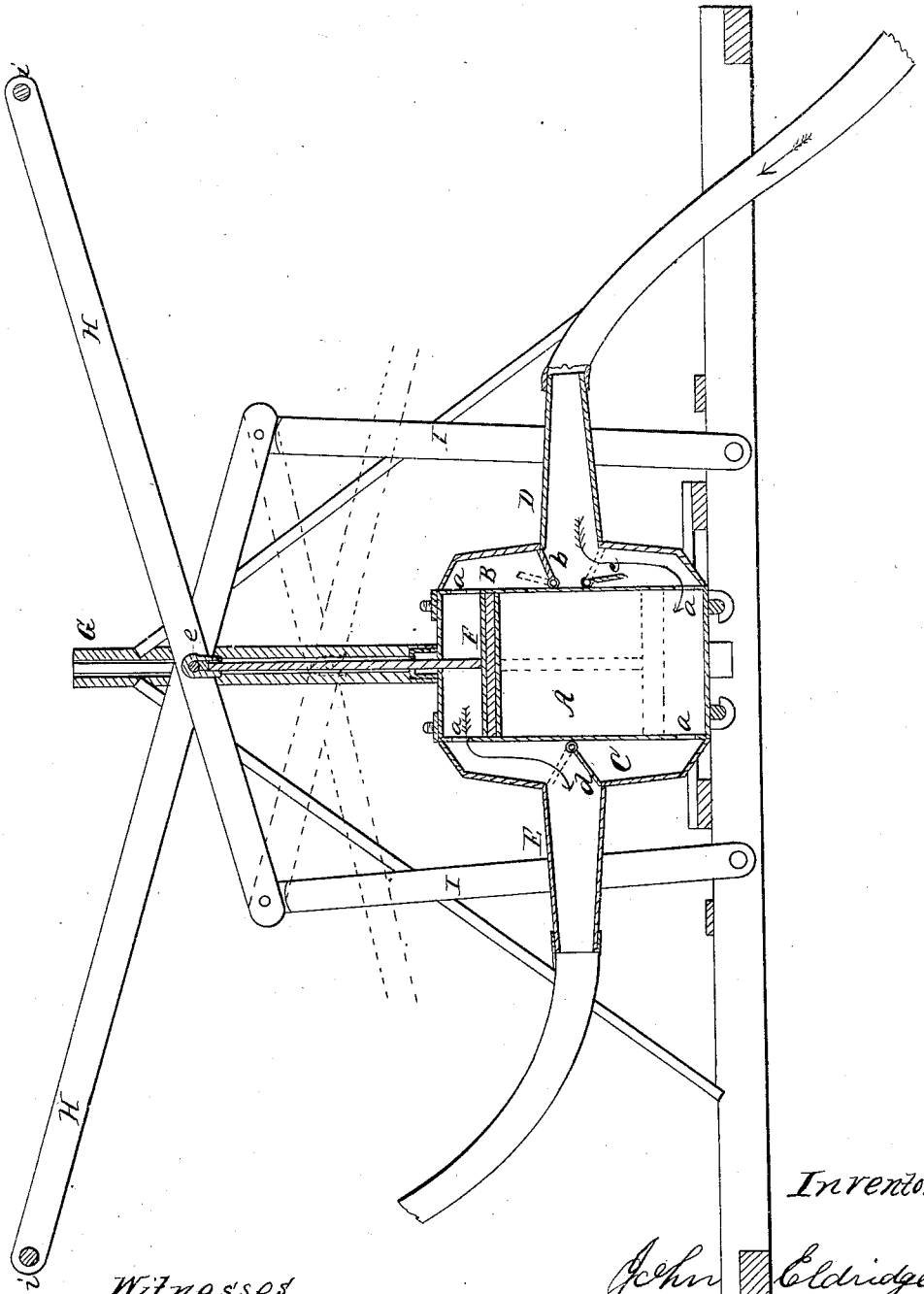
J. Eldridge,

Double-Acting Pump,

No. 51,028. Patented Nov. 21, 1865.



Witnesses

Geo. Burgess

P. T. Dodge

Inventor

John Eldridge

By W. C. Dodge

his attorney

UNITED STATES PATENT OFFICE.

JOHN ELDRIDGE, OF WEST BUXTON, MAINE.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **51,028**, dated November 21, 1865; antedated July 17, 1865.

To all whom it may concern:

Be it known that I, JOHN ELDRIDGE, of West Buxton, in the county of York and State of Maine, have invented certain new and useful Improvements in Pumps; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the arrangement of a main chamber in connection with two auxiliary chambers, and a novel arrangement of valves, whereby a continuous flow of fluid is kept up, both on the up and down stroke of the piston.

To enable others skilled in the art to construct and use my invention, I will proceed to describe it.

The body of the pump may be made of cast-iron, or any other suitable material, and is provided with a main central chamber, A, in which the piston F operates in the usual manner.

Two auxiliary chambers, B and C, are placed at opposite sides of the main chamber A, as shown in the drawing, these chambers being connected with the main chamber by the openings *a* near the top, and also near the bottom thereof. An induction-pipe, D, opens into the chamber B, as shown.

Across the chamber B, above the mouth of the inlet-pipe D, a valve, *b*, is secured in an inclined position, as shown in the drawing, this valve being pivoted on the side next to A, and so arranged as to open upward, as shown in red. Another and similar valve, *c*, is arranged in a similar manner below the mouth of pipe D in chamber B, this latter valve *c* opening downward, as shown in the drawing.

An outlet-pipe, E, opens out of the chamber C on the opposite side of A, and in this chamber a single valve, *d*, is pivoted directly opposite the center of the outlet-pipe E, as shown in the drawing. This valve, *d*, is made of such a size and is so arranged or located that it vibrates back and forth across and within the mouth of the outlet-pipe E, the walls of the opening or mouth of said pipe forming a seat for the vibrating or loose end of said valve alternately on the upper and lower walls of said pipe accordingly as said valve may be raised or lowered by the up or down stroke of the piston.

The operation is as follows: When the piston F is raised the water above it is forced through the upper opening *a* into chamber C, the valve *d* therein dropping down and cutting off communication with the lower portion of chamber C, and thus forcing the water out through pipe E, as indicated by the black arrow. At the same time the water rushes into and through pipe D to fill the vacuum created by the ascent of the piston in A, the valve *c* opening, as shown, to let it pass in, the valve *b* being held shut by the pressure of the water on its upper side, and which is forced into the upper portion of chamber B through the upper opening *a* by the ascent of the piston F, the course of the incoming water being indicated by the black arrow at the right. When the motion of the piston is reversed and it is driven to the lower portion of the chamber, as indicated in red, then the motion of the valves and the course pursued by the water is also reversed, the valves *c* closing and *b* opening, as shown in red, and the water passing from pipe D in through the upper portion of chamber B, through the upper opening *a* into the main chamber A, above the piston, while the water below the piston, drawn in by its former movement, is driven through the lower opening *a* into chamber C, and thence into pipe E, the valve *d* being forced up to the position shown in red, and cutting off communication between the upper and lower portions of the chamber C, the course of the water during this movement of the piston being indicated by the red arrows.

It will thus be seen that a continuous flow of the fluid is maintained, and that the device may be used as a force or lift pump, or as both combined, it being extremely simple and efficient.

In ordinary cases the pump may be operated by any suitable mechanism; but when used as a force-pump or fire-engine to be operated by hand, I prefer the arrangement shown in the drawings, in which two or more standards, I, are pivoted on opposite sides of the pump to a suitable frame-work at their lower ends, their upper ends being pivoted to the levers H, which cross each other, as shown, and are pivoted together at their point of in-

tersection, the bolt which unites the levers H having the piston-rod attached to it, the ends of said bolt *e* working in the guides attached to the standards G, located on opposite sides of the pump, as shown in the drawing.

The levers H may be provided with handles *i* at their outer ends, to enable a number of persons to join in operating them and thus operate the pump with great power.

It is obvious that the pump itself will operate with equal facility either end up, or on its side, the latter in some instances being considered the preferable method of arranging it, as the valves will then work with uniformity and with an equal expenditure of power.

Having thus described my invention, what I claim is—

1. The chambers A, B, and C, in combination with the openings *a*, and hinged valves *b*, *c*, and *d*, arranged and operating as and for the purpose set forth.

2. The arrangement of the pivoted standards I, cross-levers H, and posts G, provided with guides, as and for the purpose set forth.

JOHN ELDRIDGE.

Witnesses:

THOMAS T. PENNELL,

ALEXANDER H. PENNELL.