W. D. Andrews.

Double-Acting Pump.

No. 35,577. Patented June 17, 1862.

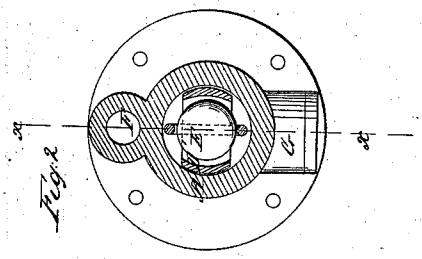

Fig. 2

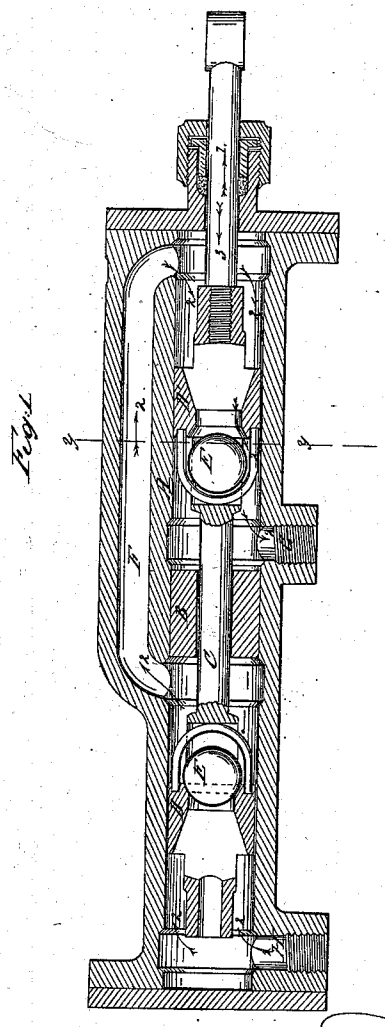

Fig. 1

Witnesses.
James Laird
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UNITED STATES PATENT OFFICE.

WILLIAM D. ANDREWS, OF NEW YORK, N. Y.

IMPROVED RECIPROCATING PUMP.

Specification forming part of Letters Patent No. **35,577**, dated June 17, 1862.

To all whom it may concern:

Be it known that I, WILLIAM D. ANDREWS, of the city, county, and State of New York, have invented a new and useful Improvement in Reciprocating Pumps; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a longitudinal central section of my invention, taken in the line *x x*, Fig. 2; Fig. 2, a transverse section of the same, taken in the line *y y*, Fig. 1.

Similar letters of reference indicate corresponding parts in the two figures.

This invention consists in the employment of a compound piston or one provided with two valves opening in opposite directions in a right line and used in connection with a water-tight partition or abutment placed within the pump-cylinder and in such relation with the two piston-valves, the eduction or discharge opening, and a water-passage communicating with the pump-cylinder, that by a simple reciprocating movement of the piston each valve will alternately propel the stream in the same direction through the pump and each valve during its reverse movement allow the stream to pass freely through it, thereby operating with a moderate expenditure of power, admitting of a rapid movement with but little wear and tear of the working parts, and raising and forcing a large volume of water in a given time.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A represents the pump-cylinder having within it a water-tight partition or abutment, B; and C is the piston-rod the piston of which is formed of two parts, D D′, each of which is provided with a valve, E, the valves opening in opposite directions or both toward the abutment B, which is between them, as shown clearly in Fig. 1. The piston-rod C works through the abutment B, and ball-valves are represented in the drawings; but other forms may be used.

F is a water-passage which is parallel with the cylinder A and communicates with it at opposite sides of the abutment B; and G is an eduction-opening which adjoins the abutment B at the side opposite to the suction end of the cylinder.

H is the induction-opening of the cylinder A, which communicates with the latter near one end of it, the abutment B being between the induction and eduction openings, but some distance from the former and by the side of the latter, as just stated.

The operation is as follows: When a reciprocating movement is given the piston-rod C, the water, when the piston-rod moves in the direction indicated by the arrow 1, will be drawn through the induction-opening H as the valve of the part D of the piston closes and the suction end of the cylinder A fills with water, while the water that is at the opposite side of part D of the valve is forced through the passage F and into the pump-cylinder at the opposite side of the abutment, and thence through the part D′ of the valve and out through the eduction-opening G. (See arrows 2.) During the opposite movement of the piston-rod C, as indicated by arrow 3, the valve of the part D of the piston opens and the valve of the part D′ closes, and the part D′ draws the water through the part D and passage F, and at the same time forces the water in front of it out through the eduction-opening G. Thus it will be seen that the two parts of the piston act alternately, and a continuous stream is drawn through the pump without being retarded in its motion or checked by the action of the valves. The arrangement at the same time is exceedingly simple, may be constructed at a moderate cost, and operated at a high speed without detriment to the working parts.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The compound piston, or one formed of two parts, D D′, each provided with a valve, E, in combination with the partition or abutment B in the pump-cylinder A, the water-passage F, and the induction and eduction openings H G, when arranged to operate as and for the purpose herein set forth.

WM. D. ANDREWS.

Witnesses:
JAMES LAIRD,
R. GAWLEY.