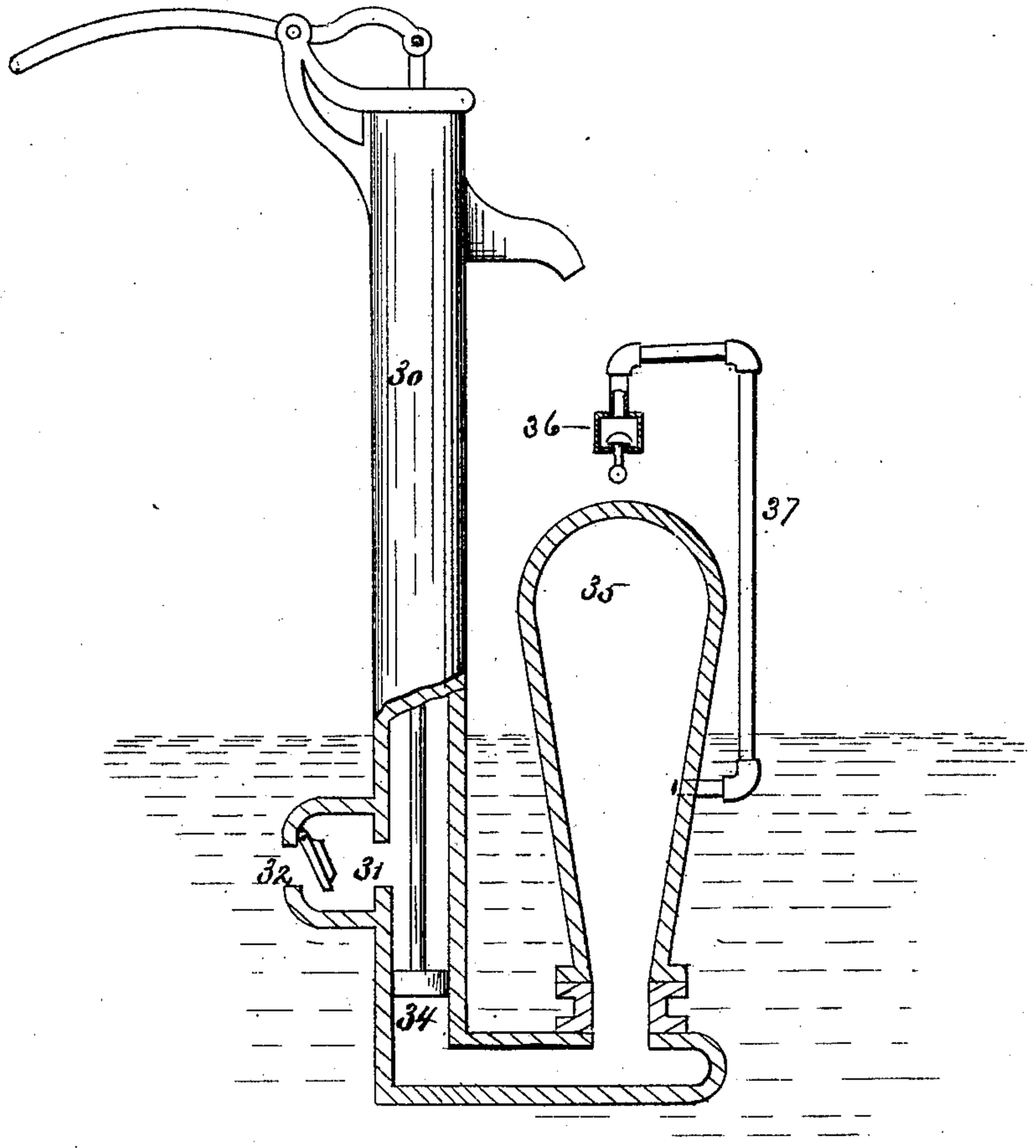
(No Model.)

R. F. DOBSON.

PUMP.

No. 360,668. Patented Apr. 5, 1887.



WITNESSES:

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UNITED STATES PATENT OFFICE.

ROBERT F. DOBSON, OF DARLINGTON, WISCONSIN.

PUMP.

SPECIFICATION forming part of Letters Patent No. 360,668, dated April 5, 1887.

Application filed May 4, 1886. Serial No. 201,065. (No model.)

To all whom it may concern:

Be it known that I, ROBERT F. DOBSON, of Darlington, in the county of Lafayette and State of Wisconsin, have invented a new and Improved Pump, of which the following is a full, clear, and exact description.

The object of my invention is to so construct a pump that liquids may be raised thereby by a smaller expenditure of force or power than is possible with any of the ordinary forms of pump—that is to say, my object is to construct a pump wherein the force or power required is less in proportion to the weight of the liquid raised than in any other form of pump. This object I accomplish by a peculiar arrangement of tubes, valves, and a piston or pistons, the parts being so connected and arranged that the pressure of the liquid in the tubes is equal upon both faces of the piston, certain other novel features and constructions being employed, as will be hereinafter described, and specifically pointed out in the claim.

Reference is to be had to the accompanying drawing, forming a part of this specification, in which the figure illustrates a sectional elevation, partly in side view, of a pump constructed in accordance with my invention.

In the embodiment of my invention I employ a single vertical tube, 30, upon one side of which there is arranged a valve-chamber, 31, having a valve, 32, the piston 34 being arranged below the valve-chamber. The equalizing of the pressure upon the piston is brought about by an air-chamber, 35, the piston reciprocating between the valve-chamber and the air-chamber.

The air-chamber 35 is provided with an air-valve, 36, applied directly to the end of the short arm of an inverted-L-shaped pipe, 37, connecting by its long arm with the said chamber about midway of its height.

In operation, the liquid is first placed in the tube 30, after which the piston is introduced and forced to its position below the valve-chamber, thus compressing the air in the air-chamber, the pressure upon each side of the piston equalizing itself, as will be readily understood. When the piston is at the end of the downstroke, there is space enough above the upper face of the piston and in the horizontal tube connecting the air-chamber with the vertical tube to allow the passage of the water from the vertical tube to the air-chamber and from the air-chamber to the vertical tube. The water in the vertical tube continues its downward motion for a short time (by its momentum) and enters the air-chamber, further compressing the air. The compressed air immediately expands and reacts, starting the water back and up the vertical tube. The reaction of the air is brought about before the piston arrives at the end of the upward stroke, so that a slight additional force applied to raise the piston will cause a partial vacuum, which is immediately filled by water entering the suction-valve. When the air in the air-chamber 35 becomes rarefied or a partial vacuum is formed, the valve 36 is lifted by external atmospheric pressure, admitting air to partly displace the vacuum, in order to supply the amount of wasted air-pressure in the air-chamber, after which the valve will be closed by the internal air-pressure, aided by its own weight, and thus cut off the escape of air past said valve until further waste of internal air-pressure takes place, when the aforesaid operation will be repeated.

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

A pump having a single valve, a vertical tube, a horizontal tube connected to the lower end of the vertical tube, an air-chamber connected to the horizontal tube, and a piston arranged in said vertical tube, said valve being arranged in a plane intermediate of the ends of the stroke of the piston, substantially as and for the purpose set forth.

ROBERT F. DOBSON.

Witnesses:
C. F. OSBORN,
P. A. ORTON.