(No Model.)

B. C. VANDUZEN.

PUMP.

No. 258,163. Patented May 16, 1882.

Fig. 1.

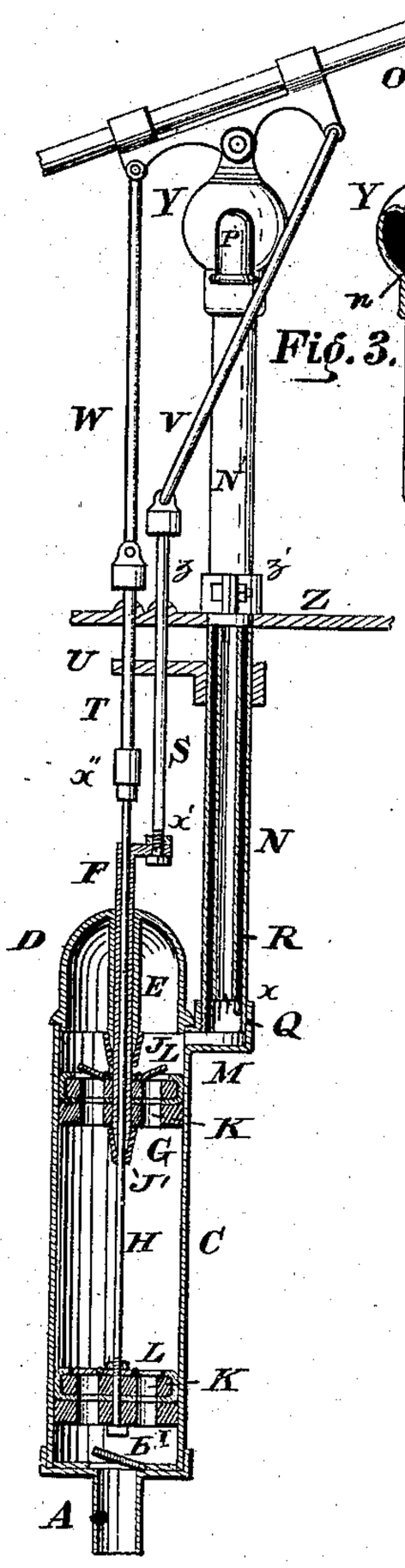


Fig. 3.

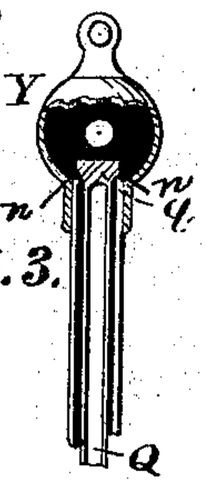
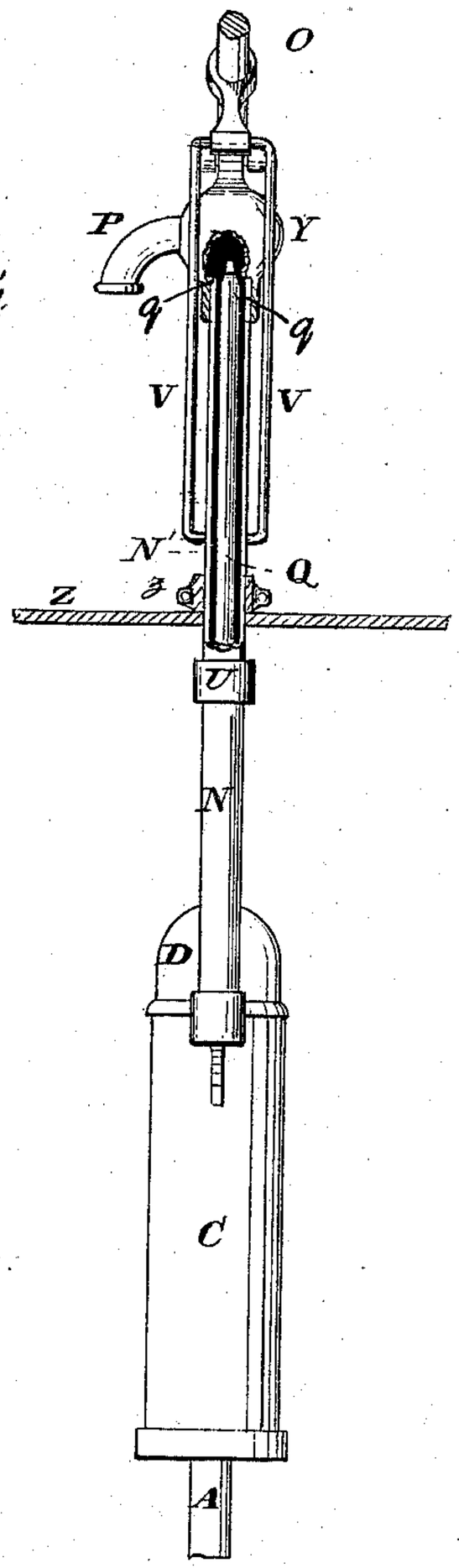


Fig. 2.



Attest

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UNITED STATES PATENT OFFICE.

BENJAMIN C. VANDUZEN, OF CINCINNATI, OHIO, ASSIGNOR TO JOHN P. MARTIN, OF NEWPORT, KENTUCKY.

PUMP.

SPECIFICATION forming part of Letters Patent No. 258,163, dated May 16, 1882.

Application filed May 26, 1881. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN C. VANDUZEN, of Cincinnati, Hamilton county, Ohio, have invented a new and useful Improvement in Pumps, of which the following is a specification.

My invention relates to an improvement in the class of pumps in which two suckers or valved pistons are so arranged and operated within one barrel or cylinder as to alternately approach and recede from one another, so as to produce the full effect of a double-acting pump by the use of a single barrel, and preferably in that form of said class in which the tubular rod of the upper piston traverses an orifice in the barrel-crown through which the rod of the lower piston passes, so as to leave the receiving end of the barrel free for attachment of a suction-pipe and suction-valve.

My invention comprises a novel form of pneumatic cushion or air-chamber, hereinafter explained.

My invention further comprises means for packing the said rods inside of the barrel, and means for securing suitable air-cushions.

In the accompanying drawings, Figure 1 represents a pump embodying my invention, partly in vertical section and partly in elevation. Fig. 2 is a side view of the same, also partly in section. Fig. 3 represents the upper part of the column by a section at right angles to that of Fig. 2.

A represents the upper extremity of an ordinary suction-pipe, whose lower portions (not here shown) extend into the well or cistern. The said suction-pipe is surmounted by a customary suction-valve, B, by which it communicates with a suitable cylinder or barrel, C, which is preferably crowned by a dome, D, having an axial orifice, from whose edges depends a tube, E, to receive the sleeve F, which constitutes the rod of my upper piston, G, and which itself receives the rod H of my lower piston, I. Annular lips or tubes J J′, one attached to the lower end of sleeve F and the other to the under side of piston G, respectively embrace the rods F and H, and, being automatically pressed to said rods with closeness proportional to the hydrostatic pressure, serve to prevent leakage, and supersede the necessity of any stuffing-box. The tubes J J′ are preferably of india-rubber. Each piston has one or more vertical openings or passages, K, guarded by one or more upwardly-opening valves, L. The upper (domed) portion, D, of the barrel serves the purpose of an air-cushion.

From cylinder C, at or near the origin of the dome, and above the highest position of piston G, extends a pipe, M, which supports and communicates with a column, N, which serves as a water-passage and as the supporting pedestal or pillar of the operating lever or handle O and of the spout P. The spout P connects inwardly, through chamber Y, with annular space R, which surrounds a pipe, Q, which extends downwardly within the column N to near the bottom thereof. The pipe Q, being closed at top *q* by being flattened in one direction and correspondingly widened in the direction at right angles thereto, and suspended on shoulders *n* in the column N, by its thus expanded head, discharges the functions of an air-cushion, while the same flattened form also affords two water-passages from the annular interstice within the pipe C and surrounding the pipe Q into the discharge-chamber Y.

Each piston-rod is coupled to another rod—to wit, the piston-rod F to a rod, S, and the piston-rod H to a rod, T—which rods are guided to a vertical path by one or more guides, U, and connect with the handle O by pitmen V and W.

Z is a cast bed-plate, having as an integral part of it a projection, *z*, between which and movable cap *z′* the upper section, N′, is clamped.

By unscrewing the couplings *x x′ x″* the pump proper may be detached and be adapted for use with a deeper well, by coupling additional rod-sections to rods T and S and pipe-sections to pipe N.

The construction of the apparatus is such as to fit it, when desired, to be placed at the bottom of a well or cistern, so as to be operated as a submerged pump.

I claim as new and of my invention—

1. The combination of the reversely-reciprocated pistons G I, the dome D, tube E, and the annular lips or collars J J′, substantially as and for the purposes designated.

2. The combination of column N with interior loosely-suspended air-chamber Q, discharge-spout P, and the operating lever or handle O, substantially as set forth.

3. A pneumatic cushion or air-chamber consisting of a pipe, Q, open below into the water-pipe, and having the hermetically-closed expanded and flattened upper end for suspension within such water-pipe, in the manner and for the purpose stated.

4. The combination of the rods F H, the interiorly-located rubber tubes or sleeves J, arranged and operating as and for the purpose set forth.

5. In combination with the pipe N′, the bed-plate Z, with integrally-cast projection *z* and separable cap *z′*.

In testimony of which invention I hereunto set my hand.

BENJ. C. VANDUZEN.

Attest:
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