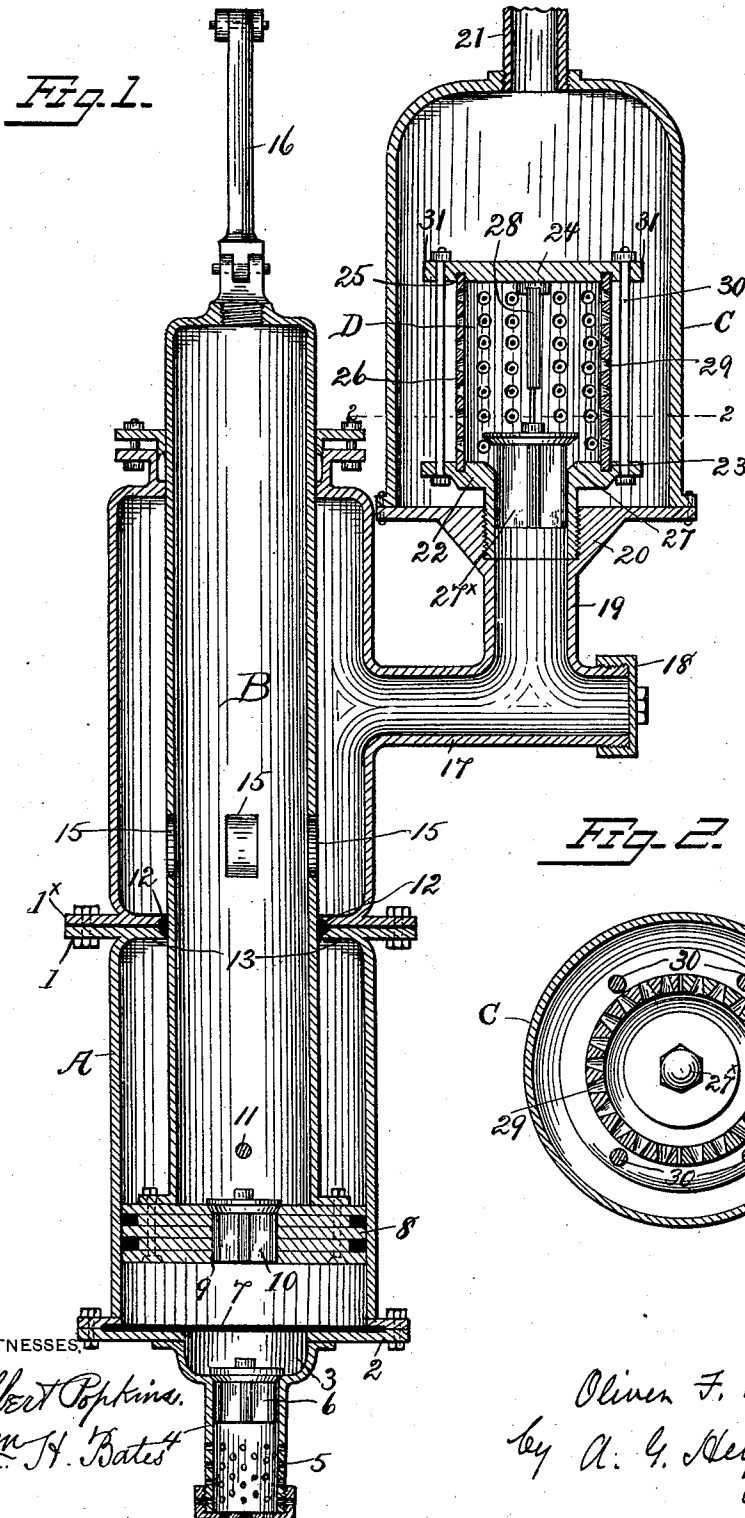


(No Model.)

O. F. BOSTWICK.
PUMP.

No. 567,533.

Patented Sept. 8, 1896.



UNITED STATES PATENT OFFICE.

OLIVER F. BOSTWICK, OF ATCHISON, KANSAS.

PUMP.

SPECIFICATION forming part of Letters Patent No. 567,533, dated September 8, 1896.

Application filed October 31, 1895. Serial No. 567,466. (No model.)

To all whom it may concern:

Be it known that I, OLIVER F. BOSTWICK, a citizen of the United States of America, residing in Atchison, in the county of Atchison, in the State of Kansas, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

My invention has relation to improvements in pumps provided with reciprocating plungers; and the object is to provide a pump with means whereby the valves are relieved from the direct weight and recoil of the rising column of water above the delivering-chamber.

I accomplish the purpose of my invention by interposing in the delivering chamber or pipe a jet-chamber formed or provided with conical jet-orifices, the apexes of which open into the surrounding delivering-chamber.

In the accompanying drawings I have fully and clearly illustrated my invention, and reference being thereto had, Figure 1 is a central vertical section of a pump having my invention applied thereto. Fig. 2 is a cross-section taken on the line 2 2 of Fig. 1.

A designates a pump stock or cylinder comprised of upper and lower sections, formed with annular flanges 1 1^x at their meeting ends and held together by screw-bolts through the flanges, substantially as shown. The bottom of the cylinder is closed by a bottom cap 2, secured thereto and formed with a valve-seat 3, in which is formed or to which is secured the supply-pipe 4, having apertures 5 to admit the water from the well or cistern. A valve 6 is arranged in the valve-seat 3, the upward stroke of which is limited by a bar 7, extending over the valve-seat, with its ends suitably secured between the end flanges of the cylinder and the bottom cap, substantially as shown.

B designates the plunger, the head 8 of which is suitably fitted to the cylinder and packed, as usual, to prevent leakage. In the plunger-head is a valve-seat 9, in which is fitted a valve 10, as shown, the upward movement of which is limited by a rod 11 across the plunger. I have illustrated the pump as provided with a hollow plunger working through packing 12, arranged in interior annular flanges 13 at the meeting ends of the sections of the cylinder. The upper end portion

of the cylinder is provided with a cap-ring through which the plunger slides, as indicated. The upper end of the plunger is closed, as shown, and in the body of the plunger are suitable ports 15, opening into the upper section of the cylinder, through which the water escapes into the cylinder, and from whence it eventually is forced up through the jet-chamber into the delivering-chamber and out through the discharge-pipe. To the upper end of the plunger is secured a pitman-rod 16, which is intended to have connection to a lever or other suitable means for imparting reciprocation to the plunger.

The upper section of the cylinder is formed with a horizontally-extended pipe 17, the end of which may be cast solid thereto or be open and have a cap 18 secured thereon to close it. From the pipe 17 is a vertically-extended pipe 19, having its upper exterior portion extended horizontally and enlarged to constitute a seat and support for the discharge-chamber C, which carries the discharge-pipe 21. The discharge-chamber C is secured to the seat 20 by means of bolts passed through an annular flange at the base of the chamber and projected through the seat 20, substantially as shown in the drawings, and to the upper end of the chamber C is secured the discharge-pipe 21, leading the water to the place of discharge.

In the discharge-chamber C is arranged and secured the jet-chamber D, the purpose of which is to relieve the valve during the operation of the pump from the pressure of the column of water in the discharge-chamber and pipe. This jet-chamber D comprises a bottom piece 22, having an annular groove 23 made therein, a top cap 24, closing the chamber and having an annular groove 25, and a cylindrical shell 26, consisting of two sections divided vertically, as shown in the drawings. The bottom piece 22 has an open neck or extension threaded into the bottom of the discharge-chamber and formed at its upper end with a valve-seat 27, in which is arranged a valve 27^x, limited in its upward movement by a rod 28, secured in the cap of the jet-chamber, substantially as shown. The cylindrical shell of the jet-chamber is provided with a plurality of conical jet-orifices 29, disposed with their apexes opening

at the outer surface of the shell and into the discharge-chamber, as seen in Fig. 3 of the drawings. This construction and disposition of the jet-orifices result in making the flow of water from the interior of the jet-chamber outward meet with less resistance than that attending the reverse or return flow from the exterior of the said chamber, the results being attained by the contracted area of the apex-openings of the orifices presented to the water on the outside and surrounding the jet-chamber, whereby the water is facilitated in its flow from the interior to the exterior by a series of ajutages, while in flowing from the exterior to the interior it passes through simple orifices. The sections of the jet-chamber have their respective ends arranged in the annular grooves of the cap and bottom pieces, and the parts are held together by bolts 30, let through flanges or lugs 31 on the top and bottom. The jet-chamber is constructed in the manner shown and specified in order that the conical jet-orifices can be formed expeditiously, conveniently, and accurately, and also that ready access to the valve may be had when required. I have ascertained from experiment and calculation that the best results are attained by making the aggregate area of the apex-orifices in the jet-chamber substantially equal to the transverse area of the pipe or valve leading into the jet-chamber.

My invention is especially adapted to "deep-well" pumps, or to other instances or circumstances where water is to be raised or pumped through discharge-pipes of great length.

It will be perceived that by making the jet orifices or apertures conical and disposed with their apex-openings leading into the surrounding discharge-chamber the discharging force will not be impeded or interfered with, but that the recoil, impact, or reverse action of the column of water against the

valve will be lessened, because of the resistance presented by the contracted area of the respective apex-orifices of the jet-apertures, and thus relieving the valve of a strong and wearing beat, usually present in pumps of other constructions, and consequently so long as the weight of the discharging column of water is not fully in the jet-chamber and on the valve therein the dead-point of the lifting or return stroke of the plunger is that much easier overcome.

My invention can be adapted to pumps of other constructions than that herein shown and described with equal convenience and advantageous results.

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

1. In a pump, the combination with the pump mechanism and the delivering-chamber of a jet-chamber arranged and secured in the delivering-chamber and provided with a plurality of jet-orifices distributed throughout its cylindrical surface, said jet-orifices being conical in conformation and having their apex-openings at the outer surface of the jet-chamber, and a valve at the base of the jet-chamber, substantially as and for the purpose specified.

2. The jet-chamber for a pump, comprising a bottom piece formed with a valve-seat, a valve in said seat, a cylindrical shell consisting of two sections and provided with conical jet-orifices disposed with their apex-orifices opening at the outer surface of the shell, a cap-piece over the shell, and fastening-bolts to hold the parts together.

In witness whereof I have hereto set my hand in the presence of two attesting witnesses.

OLIVER F. BOSTWICK.

Attest:

A. G. HEYLMUN,
GEO. L. BOSTWICK.