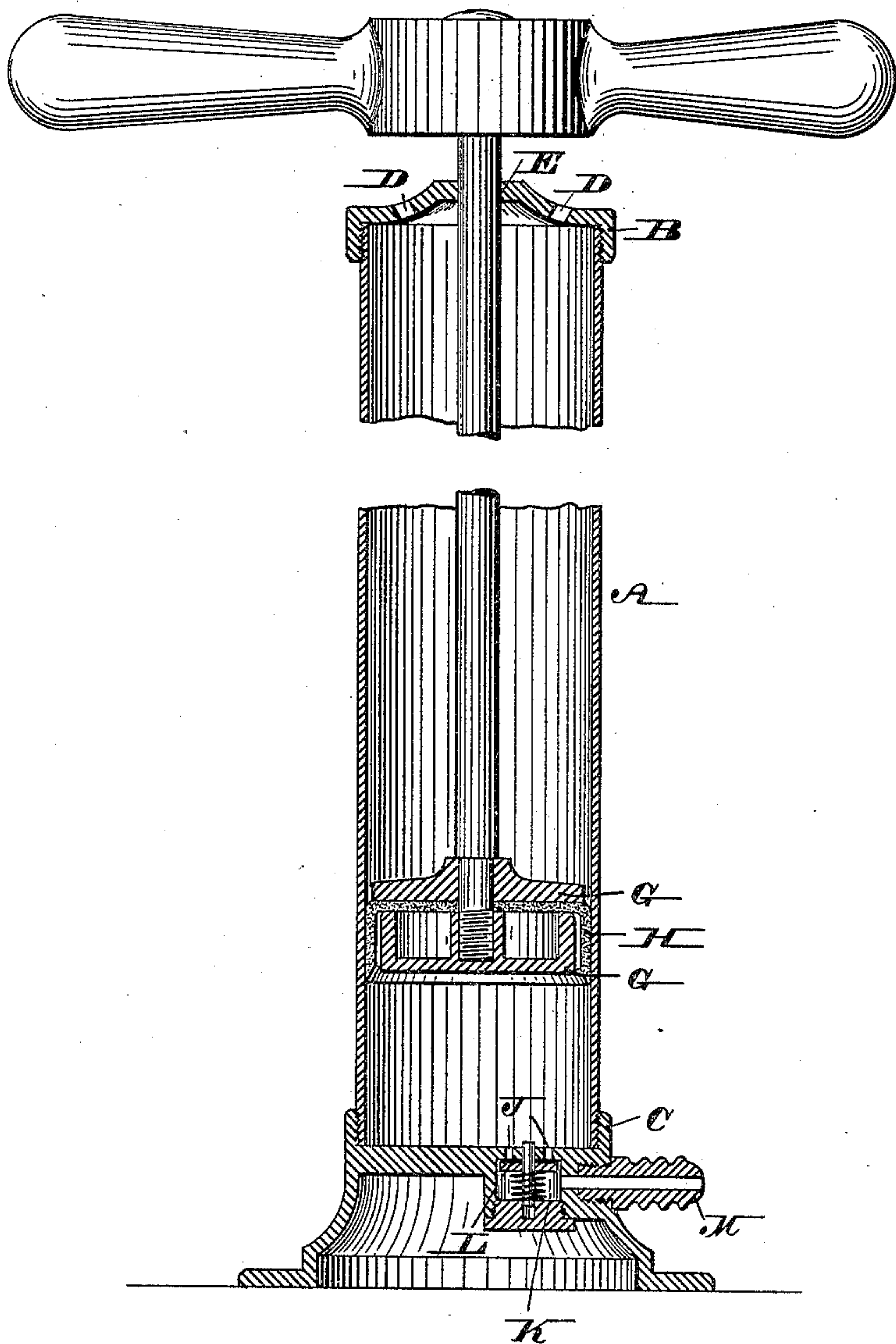


(No Model.)

W. BOEKEL.  
PUMP.

No. 409,163.

Patented Aug. 20, 1889.



Witnesses

*Thos. Rolfe.*  
*A. P. Jennings.*

Inventor  
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By his Attorneys  
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# UNITED STATES PATENT OFFICE.

WILLIAM BOEKEL, OF PHILADELPHIA, PENNSYLVANIA.

## PUMP.

SPECIFICATION forming part of Letters Patent No. 409,163, dated August 20, 1889.

Application filed September 13, 1888. Serial No. 285,297. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM BOEKEL, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Pumps, which improvement is fully set forth in the following specification and accompanying drawings.

My invention relates to improvements in pumps; and it consists of a pump adapted to be operated by means of a single valve.

The drawing represents a vertical sectional view of a pump embodying my invention.

Referring to the drawing, A designates the cylinder or barrel of the pump, B the upper head or cap, and C the lower head or cap secured onto the cylinder or barrel. The cap B is provided with air-inlet openings D and an opening E, to allow the passage of the piston-rod F.

To the lower end of the piston-rod are secured the disks or flanges G, and between said disks is secured the flexible cup H, which may move to and from the adjacent wall of the barrel.

The lower cap C is provided with openings J, communicating with a valve-chamber K, in which is placed the spring-actuated foot-valve L, and communicating with the valve-chamber K is an outlet pipe or nozzle M.

The operation is as follows: When the piston is raised, the suction thereof closes the foot-valve, and fluid above the piston, which enters through the inlet-openings in the cap,

presses downward on the flexible cup, causing the same to contract and allow the fluid to pass under the piston-head. On the downstroke of the piston the flexible cup is caused to expand by pressure under the same, opening the foot-valve and forcing the fluid out through the outlet pipe or nozzle. It is thus evident that the flexible cup acts as a valve, contracting under the downward pressure of the fluid to allow the same to pass below the cup and expanding under the upward pressure of the fluid, forcing the same, which has passed below the cup, out through the nozzle or pipe.

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

The combination, in a pump, of a chamber having inlet-openings at the top and a valveless piston therein, the piston-head having a flexible cup, the depending wall of which is free to yield inwardly, so as to be in contact with the walls of the chamber during the downstroke and free therefrom on the upstroke, and a second chamber below said first chamber and in communication therewith and provided with a rising and falling valve which controls said communication, substantially as described.

WM. BOEKEL.

Witnesses:

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