(No Model.)

# C. E. LOTH.

## BARREL PUMP.

No. 307,862. Patented Nov. 11, 1884.

Fig. 1.

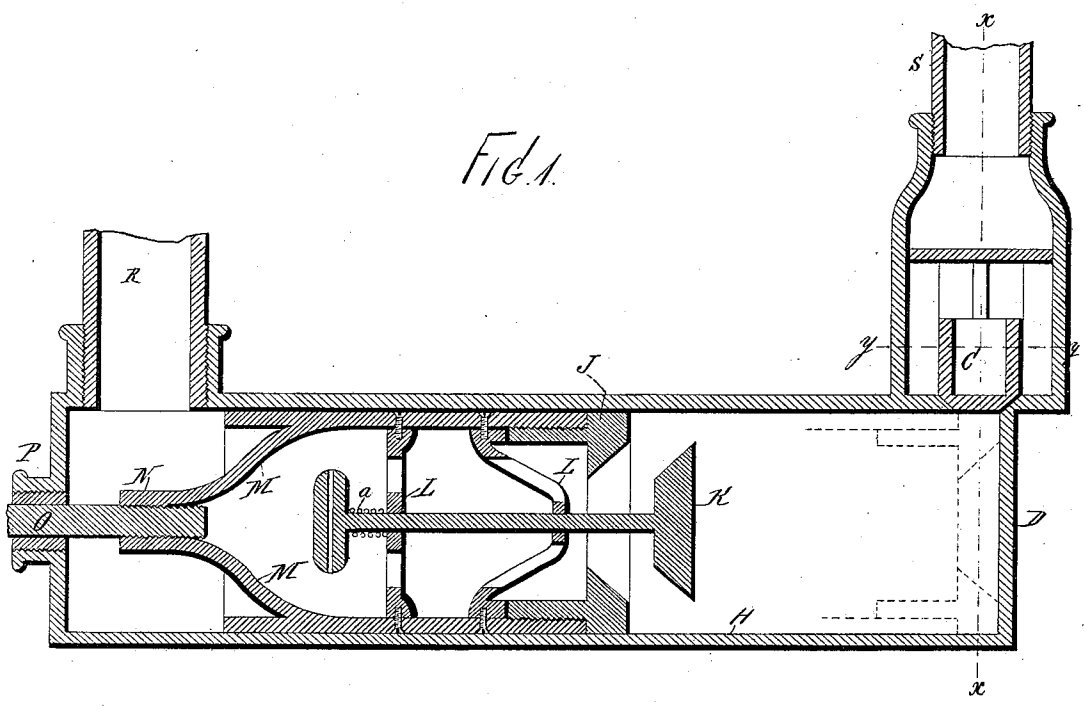



Fig. 2.

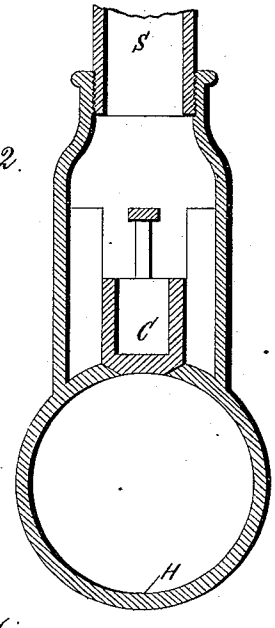
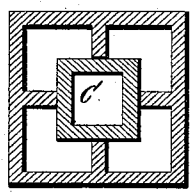



Fig. 3.




Witnesses:
John Buckler,
Henry Sieb

C. Edward Loth,
Inventor:
By Worth Osgood,
Attorney.

N. PETERS. Photo-Lithographer, Washington, D. C.

# UNITED STATES PATENT OFFICE.

C. EDWARD LOTH, OF TROY, NEW YORK, ASSIGNOR OF SIXTY ONE-HUNDREDTHS TO FRED W. RICHARDSON AND EDWARD W. LOTH, BOTH OF SAME PLACE.

## BARREL-PUMP.

SPECIFICATION forming part of Letters Patent No. 307,862, dated November 11, 1884.

Application filed January 25, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, C. EDWARD LOTH, a citizen of the United States, residing at Troy, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Barrel-Pumps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and the letters of reference marked thereon.

My improvements have relation to that class of pumps wherein a piston or plunger is made to reciprocate within the pump-barrel, and wherein direct-acting inflow and discharge valves are employed, the object of my invention being to obtain, practically, a complete vacuum between the faces of the plunger, the faces of the valves, and the inner surface of the pump-barrel, thus to insure the ready inflow and the complete discharge of hot water or of steam, and to accomplish the movement of the liquid or fluid under pressure or otherwise by the operation of the pump. To accomplish this my improvements involve certain novel and useful arrangements or combinations of parts, peculiarities of construction, and principles of operation, all of which will be herein first fully described, and then pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is an axial section of a pump constructed and arranged for operation in accordance with my invention. Fig. 2 is a vertical section on line *x x* of Fig. 1. Fig. 3 is a horizontal section on line *y y* of Fig. 1.

In all these figures like letters of reference, wherever they occur, indicate corresponding parts.

H is the pump-barrel; J, the piston movable back and forth therein, and provided with a piston-rod, O, and valve K, the latter being shown in open position. The face of valve K (when seated) is on a line with the face of the piston or plunger, and the stem of said valve passes through guides L L. M M are braces with open spaces between them, serving to connect the plunger with the head N, to which rod O is applied, said rod passing through a stuffing-box, P. Motion may be imparted to the plunger by any suitable power.

R is the inflow-pipe leading to the pump-barrel, and S is the outflow-pipe.

Around the stem of valve K is a spring, *a*, of strength a little greater than necessary to counterbalance the weight of metal in the valve and friction of its parts.

C is the valve which permits the passage of liquid or fluid to the outflow and checks its return. The face of said valve conforms in shape to the side of the plunger, as indicated in Fig. 2, and the body of this valve may be square, as indicated in Fig. 3, or otherwise so formed as to be guided in its sliding movements in such manner that at the end of the stroke of the plunger it (the valve) will always close to the same position, its face conforming to the side of the plunger and fitting closely thereon. The face of the plunger and that of the valve K contained therein do not come in actual contact with the head of the barrel at the end of the stroke, but as near thereto as is practicable in a pump having a fixed head and to be worked by other than hand-power. The valve C is located as shown in Fig. 1, so that the port governed thereby extends to the extreme limit of stroke of piston in order that as the piston approaches the limit of its stroke practically all the liquid or fluid may be forced out through the port governed by the valve, and when the piston starts in the reverse direction there will be practically no liquid or fluid to expand in the space between the head and piston and thereby impair the efficiency of the pump. As soon as the piston completes its forward stroke the valve C closes. The dotted lines in Fig. 1 indicate the position of piston and its valve at the end of the forward stroke.

The improved pump is specially designed for use in forcing hot water and steam, and therefore the parts are made of material calculated to withstand their action. The face of the piston or the valve-seat is threaded into the main body of the piston to hold a packing gasket or ring, and also in conjunction with the threading of rod O into head N, to accurately regulate the limit of travel in the for-

ward stroke. On the return movement of the piston the valve C will close accurately to its seat, and as this movement is continued valve K will open and the hot water or steam from the rear of the plunger will rush in and fill the barrel. At the instant the movement is again reversed the valve K will close to its seat and force all the liquid or fluid in advance of it to pass to the outlet. Thus the operation of the pump may be continued.

I am aware that an air-pump having a valve extending entirely across the lower end of the cylinder is not new, and I do not claim such construction.

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

1. In a pump of the character herein set forth, the combination, with the cylindrical barrel provided with inflow and outflow pipes, of the reciprocating plunger having the adjustable head, the inflow-valve located in said head and having its face flush with the face of the head, and the outlet-valve located on one side of the cylinder, guided in its chamber, and a governing port which extends to the line of the stationary cylinder-head, the face of said outflow-valve being made to conform to the surface of the side of the plunger, substantially as shown and described.

2. In a pump of the character herein set forth, the combination of the pump-barrel or cylinder H, having outlet-valve C, the plunger having the adjustable head, and the inflow-valve located in the head of the plunger, substantially as shown and described.

3. In a pump of the character herein set forth, the combination, with the pump-barrel, of the outflow-valve located upon one side of and at the extremity of the cylinder, the inner face of said valve being made to conform to the surface of the side of the piston, and the valve being guided in the outlet-chamber, substantially as shown and described.

C. EDWARD LOTH.

Witnesses:
GUSTAV DOERLE,
CONRAD SCHMIDT.