

No. 617,912.

Patented Jan. 17, 1899.

A. STARKE.
PUMP VALVE AND CYLINDER.

(Application filed Apr. 5, 1898.)

(No Model.)

Fig. I.

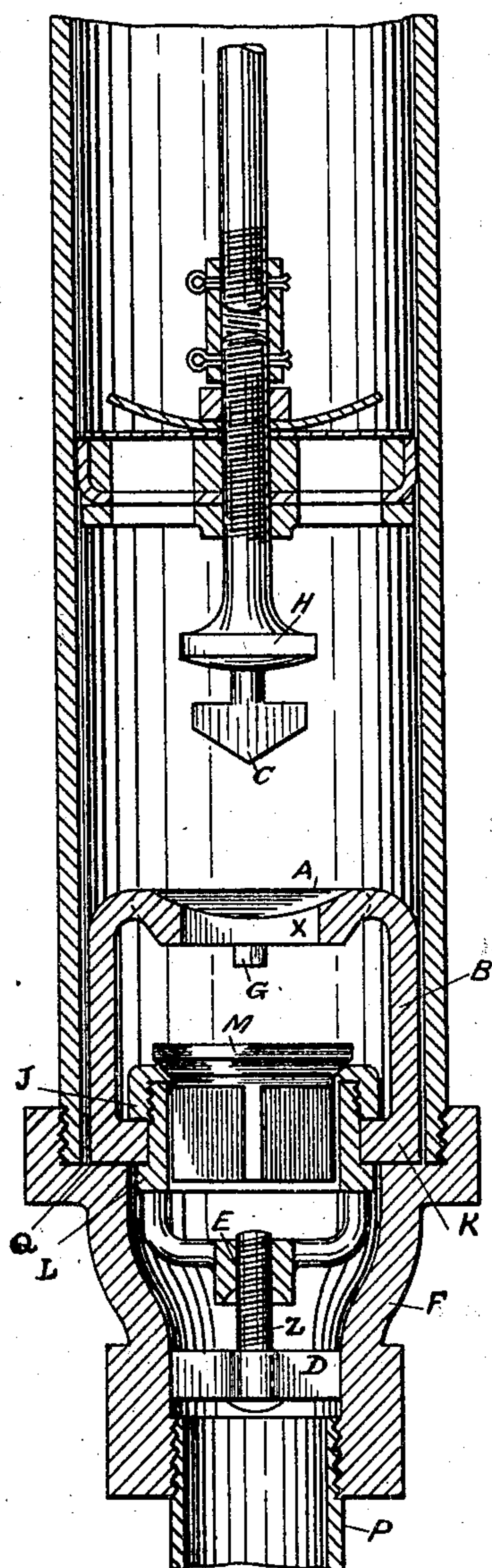


Fig. II.

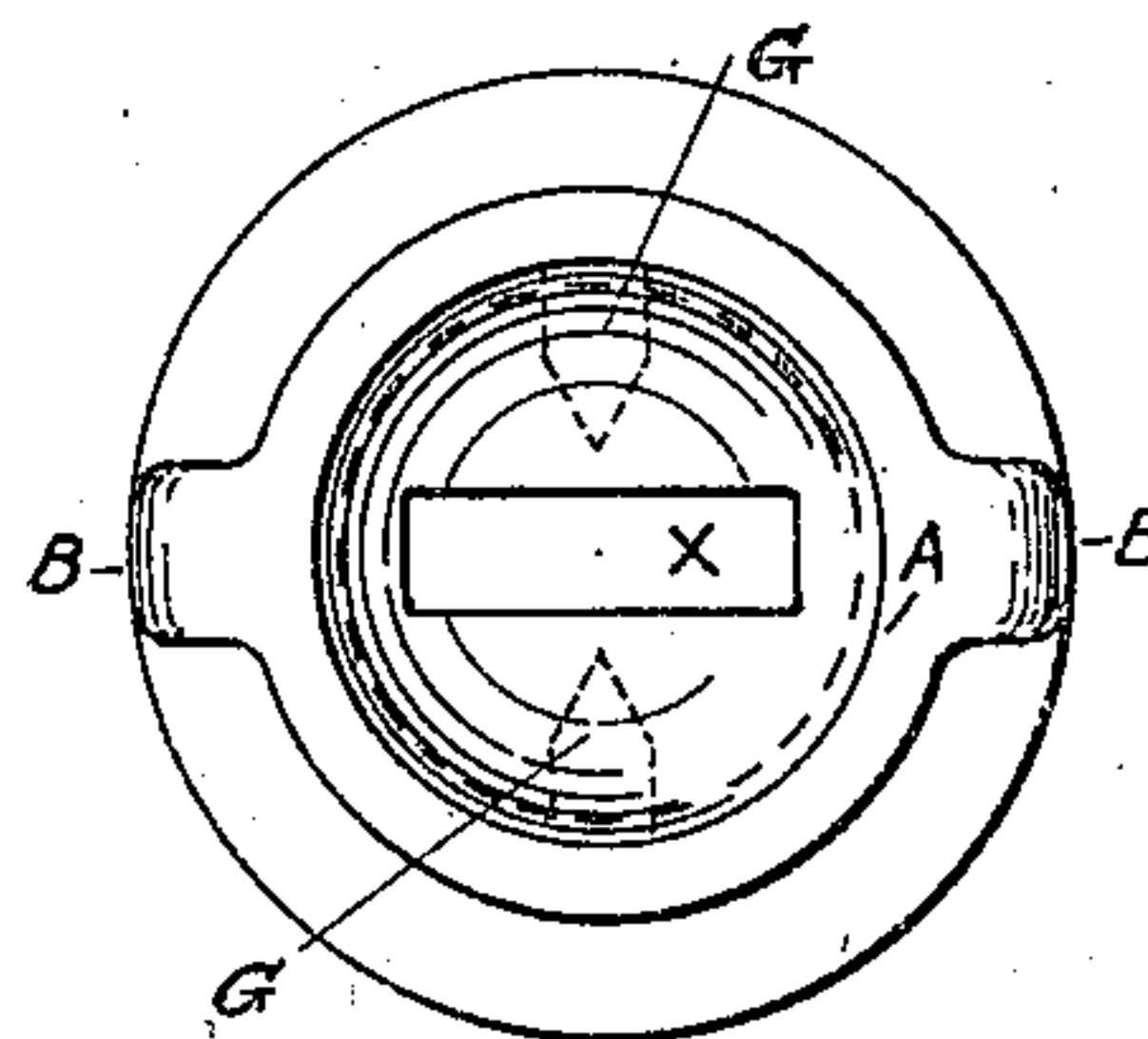
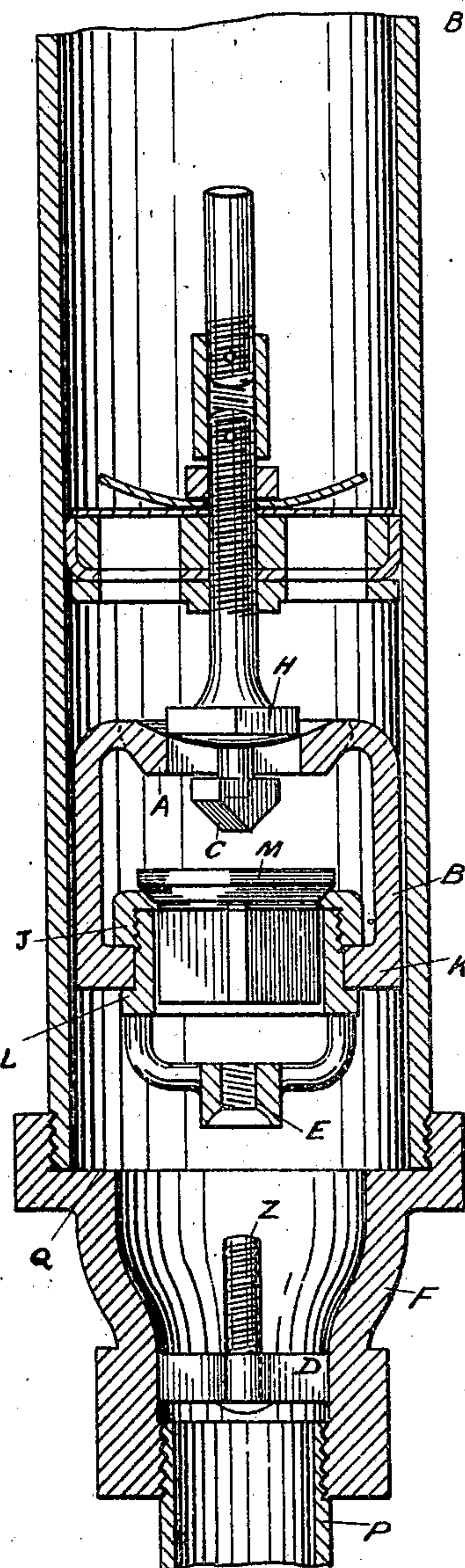


Fig. III.

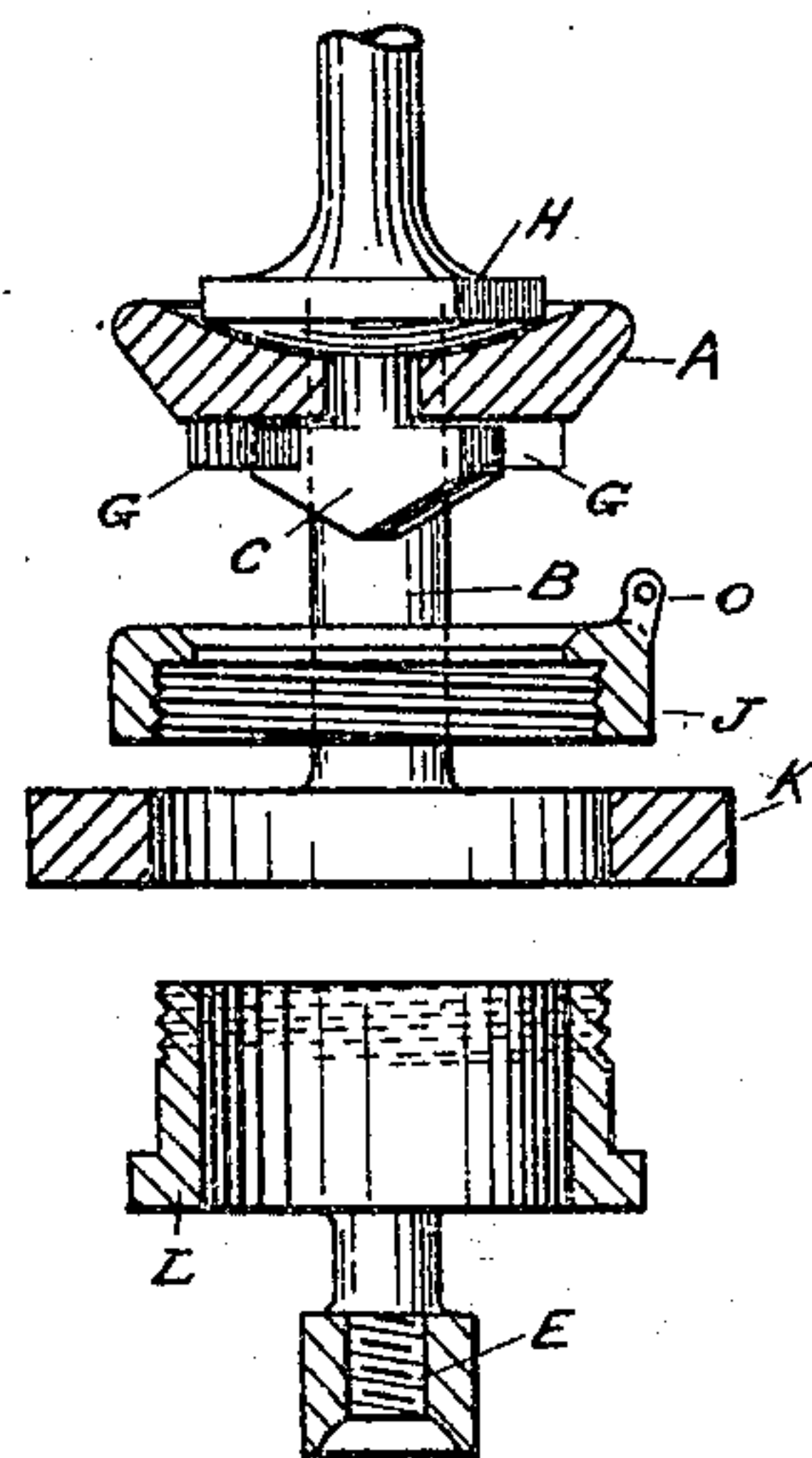


Fig. IV.

WITNESSES.

Oriston W. Noland
Joseph Anthony

INVENTOR.

Ashton Starke

UNITED STATES PATENT OFFICE.

ASHTON STARKE, OF RICHMOND, VIRGINIA.

PUMP VALVE AND CYLINDER.

SPECIFICATION forming part of Letters Patent No. 617,912, dated January 17, 1899.

Application filed April 5, 1898. Serial No. 676,605. (No model.)

To all whom it may concern:

Be it known that I, ASHTON STARKE, a citizen of the United States, residing at Richmond, in the county of Henrico and State of Virginia, have invented a new and useful Improvement in Pump Valves and Cylinders, of which the following is a specification.

My invention relates to improvements in pumps for wells, &c.; and the objects of my improvements are, first, to provide a valve-seat and valve which may be removed from the cylinder and up through the tubing of the pump without the use of outside appliances and rendering it unnecessary to either remove the pump or to descend into the well for such purpose, and, secondly, to so construct the bottom of the cylinder as to securely hold the valve-seat and cage in their positions. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure I is a vertical section of the whole construction, each part being in its relative position as when in operation. Fig. II shows the valve-cage disengaged from the threaded pin which fastens and holds the said cage down upon the inside face of the cylinder-socket. Fig. III is a top view of the valve-cage, showing the long or slot hole through which the arrow-shaped lower end of the plunger-rod is passed. Fig. IV shows sectional parts of the valve-cage and valve-seat in regular order.

Similar letters refer to similar parts throughout the several views.

In Fig. I, A B K constitute the upper portion of the cage and L the lower portion, the lower portion of L extending down into two arms, which terminate at E, at which point is a threaded hole made to engage with the threaded pin Z. The upper part of this lower portion of the cage is threaded to receive the valve-seat J. A vertical check-valve M is shown resting on the seat J, while at O, Fig. IV, is shown a projection to which may be attached a hinged valve to work on the same valve-seat.

In Fig. III at X is shown the long or slot hole. By pushing the lower (arrow) end of the plunger-rod down this arrow end strikes in the cup or concave shaped top of the cage, and by turning the plunger-rod this arrow-

shaped end finds its way through the slot or long hole and is prevented from going too far by the projection H. Turning, then, the plunger-rod, the arrow-shaped end comes in contact with and presses against the projections G, which projections are so shaped and situated as to allow the arrow-shaped lower end of the plunger-rod C to stand as near at a right angle to the slot or long hole X as possible. By turning, then, the plunger-rod to the right, say, the lower end of the cage at E is screwed down upon the pin Z, and the base of the cage at K is made to rest on the projection of the cylinder-socket at Q, forming a water-tight joint. On the other hand, by turning the plunger-rod to the left the arrow-shaped end of the plunger-rod C is reversed and made to press against the opposite sides of the projections G and so unscrews the threaded end of the cage at E and disengages it from the pin at Z. When the plunger-rod has thus been used to screw or fasten down the cage on the pin Z, by turning backward the plunger-rod and gently pulling it upward at the same time the arrow-shaped end once again finds the long or slot hole in the upper portion of the cage and passes through the same, leaving the cage fixed in position.

To remove the valve-seat and valve, which are located in the cage, from the cylinder, the plunger-rod is turned so as to unscrew the cage from the pin Z, and the arrow-shaped end of the plunger-rod standing nearly at right angles to or across the slotted or long hole X the cage is thus drawn or lifted up through and out of the cylinder and up through the tubing of the pump.

The bottom of the cylinder-socket F is provided with a cross-bar D, in which cross-bar is fixed and set the threaded pin Z, and the extreme bottom of this cylinder-socket is threaded to receive the pipe P, which pipe is intended to extend down into the water.

I am aware that pumps have been made prior to my invention with wire-caged check or puppet valves, which valves may be removed from the cylinder without the aid of outside appliances; but in these there is no provision for removing the valve-seat, as well as the valve itself, and, further, such wire-constructed cage or puppet valves are frail and subject to easy breakage and being bent

so out of shape as to render them useless; nor is there provision for using a hinged as well as vertical valve.

A most important advantage possessed by my pump-valve over those hitherto in use is the removability of the valve-seat for repairs, for the insertion of a check-valve, and for the insertion and the secure holding of a gasket.

To remove the seat J, the lower part of the valve-cage L is unscrewed from the said seat J, which can then be slid out sidewise. To insert a check-valve whose total length is such that it will just pass between the upper surface of the ring K of the valve-cage and the lower surface of the slotted top A of the said valve-cage, I remove the valve-seat, as described above, slip the seat around the wings of the check-valve, slide the valve, with the seat, into place, drop the seat into position, and screw into it from below the lower part L of the valve-cage. A gasket can be inserted by dropping it over the upper threaded portion of the lower part L of the valve-cage before the latter is screwed up into the seat J. There may have been made valve cages or seats to screw down into the bottom of the cylinder and which depend upon one thread being less tightly screwed than another to enable one to release the seat or valve; but in such the diameter of these seats or valves where they are threaded is so great that the leverage is against the operation, whereas in my invention the diameter of the holding-pin is reduced to a minimum, and thus the screwing on or off of the valve-cage is rendered certain.

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

1. In a pump, a socket having rigidly supported within it a threaded pin adapted and arranged to engage a threaded part in the lower end of a valve-cage to hold the said valve-cage in position, in combination with a valve-cage having at its lower end a threaded part adapted to engage the threaded pin, substantially as described.

2. In a pump, the combination with a valve of a valve-seat, and a valve-cage consisting of an upper and a lower part, the lower part extending upward through an aperture in the upper part and having a threaded portion

adapted and arranged to engage a threaded portion in the valve-seat to hold the said valve-seat removably in position, substantially as described.

3. In a pump, the combination with a valve of a valve-seat, a valve-cage consisting of an upper and a lower part, the lower part extending upward through an aperture in the upper part and having a threaded portion adapted and arranged to engage a threaded portion in the valve-seat to hold the said valve-seat removably in position, and having another threaded portion adapted and arranged to engage a threaded pin attached to a socket to hold the valve-cage removably in position, and a socket having rigidly supported within it a threaded pin, substantially as described.

4. In a pump, the combination of a socket having rigidly supported within it a threaded pin adapted and arranged to engage a threaded part of a valve-cage to hold the valve-cage in position, a valve-cage consisting of an upper and a lower part, the said lower part extending upward through an aperture in the upper part and having a threaded portion adapted and arranged to engage a threaded portion in the valve-seat to hold the said valve-seat removably in position, and having another threaded portion adapted and arranged to engage the threaded pin, which is rigidly supported within the socket, to hold the valve-cage removably in position, and the upper part having a cup-shaped top provided with a perforation or slot adapted to receive the headed end of a plunger-rod, and provided with lugs adapted to engage the said headed end of the plunger-rod, a plunger-rod having a headed end adapted to enter the perforation or slot in the cup-shaped top of the valve-cage, and adapted to engage the lugs on the said top of the valve-cage to screw or unscrew the valve-cage on or from the threaded pin when the plunger-rod is rotated, a valve-seat having a threaded portion adapted and arranged to be engaged by a similarly-threaded portion in the lower part of the valve-cage to hold the said valve-cage in position, and a valve, substantially as described.

ASHTON STARKIE.

Witnesses:

JNO. O. TAYLOR,
A. W. CARTER.