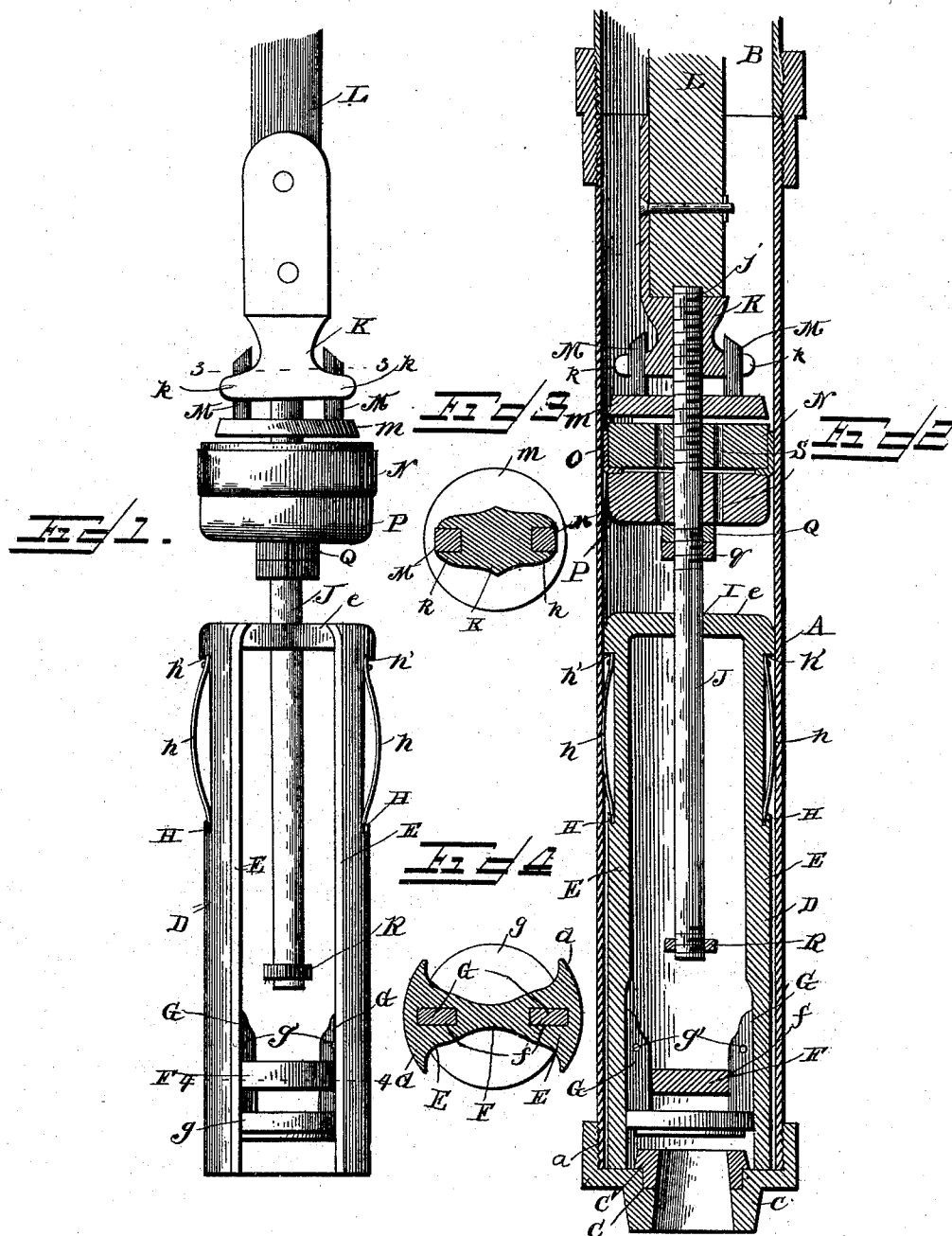


(No Model.)

S. M. FULTON & A. T. AMES.
PUMP.

No. 505,599.

Patented Sept. 26, 1893.



Witnesses

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SAMUEL M. FULTON AND ALDEN THAYER AMES, OF GALT, CALIFORNIA.

PUMP.

SPECIFICATION forming part of Letters Patent No. 505,599, dated September 26, 1893.

Application filed November 11, 1892. Serial No. 451,669. (No model.)

To all whom it may concern:

Be it known that we, SAMUEL M. FULTON and ALDEN THAYER AMES, citizens of the United States, residing at Galt, in the county of Sacramento and State of California, have invented a new and useful Pump, of which the following is a specification.

This invention relates to pumps; and it has for its object to provide certain improvements in lift pumps used in connection with deep or other wells, and which shall provide efficient valve constructions and arrangements. To this end the invention primarily contemplates certain improvements in the valved plungers and foot valve devices of a pump, whereby all the working parts of the pump can be entirely removed and replaced without disturbing the pipe or pump cylinder.

With these and many other objects in view which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

In the accompanying drawings:—Figure 1 is a vertical sectional view of a pump constructed in accordance with our invention. Fig. 2 is a side elevation of the plunger and valve holder removed from the cylinder. Fig. 3 is a detail sectional view on the line 3—3— of Fig. 1. Fig. 4 is a detail sectional view on the line 4—4 of Fig. 1.

Referring to the accompanying drawings: A represents a straight-barreled pump cylinder adapted to have its lower end placed in the well or liquid to be elevated, or connected in the ordinary line of pipe leading to the water in the well, and the said cylinder A has connected to the upper end thereof the discharge pipe B, leading to the point of discharge for the water. The said pump cylinder A, is provided with a lower exteriorly threaded end *a*, which receives the lower interiorly threaded head or cap C, having the interior shoulder *c*, in which is seated the raised valve seat *c'*, projecting into the lower end of the cylinder and forming a seat for the valve, carried and guided by the elongated removable valve holder D. The valve holder D, is adapted to be removably placed in the lower half of the cylinder A and comprises the opposite vertical arms E, connected at their up-

per ends by the cross bar *e*, and at a point near their lower ends, which are adapted to rest upon the head or cap C, by the transverse guide bar F, provided at opposite ends thereof with the vertical guide openings or slots *f*. The guide openings or slots *f* are adapted to loosely receive the projecting guide stems G, of the disk foot valve *g*. The guide stems G, project from opposite edges of the valve *g*, and are adapted to reciprocate within the guide slots or openings *f*, as the valve is opened or closed over the lower valve seat *c'*, and said stems G, receive above the transverse guide bar F, the stop pins *g'*, which, while not interfering with the free vertical movement of the valve and its stems, at the same time provide means for holding the valve within the holder while the same is either being removed from the cylinder or placed in its proper position therein, thereby affording means for the ready removal of the lower valve from the cylinder. The opposite arms of the valve holder D are rounded as at *d*, to correspond to the curvature of the inner walls of the cylinder, but do not snugly register therewith, so as to allow for the free removal of the holder. The said arms of the holder are further provided with the notches H, which loosely receive the free ends of the retaining bow springs *h*, the other ends of which are firmly secured at *h'*, to the holder, and said springs are adapted to bulge out from the opposite sides or arms of the holder and grasp the inner walls of the cylinder, so as to secure the valve holder stationary in its proper position within the lower half of the pump cylinder as will be apparent.

The upper cross bar *e*, is provided with a central perforation I, which accommodates the plunger stem J, adapted to freely reciprocate through said opening and within the removable valve holder. The upper end of the plunger stem J, is threaded as at *j*, to receive the threaded rod-head K. The rod-head K is securely bolted to the lower inner end of the pump or plunger rod L, and is provided with the laterally extended bifurcated guide ears *k*, which receive and guide the oppositely projecting valve stems M, projecting from opposite edges of the plunger valve or disk *m*. The plunger valve or disk *m*, is thus held steady in its reciprocations over the

plunger stem J, near the upper end thereof, and directly under the rod head K, and said plunger valve is adapted to work over and upon the upper plunger disk N. The upper
 5 plunger disk N, is threaded onto the stem J, so as to allow the valve *m*, to play therebetween and the head K, and said disk is surrounded by the leather cup packing ring O, meeting the sides of the cylinder, and the
 10 lower edge of which is clamped between said upper disk and the lower plunger disk P. The lower plunger disk is mounted loosely on the stem J, and is clamped to the upper disk by means of the jam nuts Q, threaded onto
 15 the stem J, at *q*, and securely clamping the plunger head or disks firmly together.

The lower end of the stem J, within the holder D, receives the lifting nut R, which is adapted to hold the plunger stem to the valve
 20 holder, in order that the latter can be readily lifted out of the pump cylinder when desired, as will be apparent, inasmuch as the nut R, will not pass through the perforation or opening in the upper cross-bar *e*, of the valve
 25 holder. It will be further observed at this point that the stroke of the plunger is limited to the play allowed between the jam nuts Q, on the stem, and the nut R, at the lower end thereof. It is now thought that the operation and many advantages of the herein described pump will be apparent.

The cylinder and discharging pipe having been placed in proper position within the well, the plunger and the valve holder on the
 35 stem thereof, as illustrated in Fig. 2, are shoved within the cylinder from the top of the pump, until the lower end of the valve holder rests solid on the lower cap C. The pump is now set up for use, and it will be apparent that as the plunger is moved up, the
 45 lower foot valve lifts and allows the water to enter the cylinder. On the down stroke of the plunger, the foot valve, *g*, closes, and the water passes through communicating water
 45 passages S, in the plunger disks, lifting the plunger valve *m*, and passing up into the discharge pipe, through which the water is forced or lifted on each up stroke of the plunger, when the plunger valve closes. It is of course
 50 understood that the valve holder remains stationary while the pump is in operation, but

can be readily removed from the pump cylinder when desired, as already noted.

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

1. In a pump, the combination with a valved cylinder and the pump rod moving therein; of a rod head securely bolted to the inner end of said pump rod and provided with a central
 60 threaded opening and opposite laterally extended bifurcated guide ears, a removable plunger stem having an upper threaded end removably engaging the threaded opening of
 65 said rod head, an upper plunger disk threaded onto said removable plunger stem below said rod head, an adjacent plunger disk loosely mounted on said plunger stem and clamped under the upper disk, both of said plunger
 70 disks having aligned fluid passages, and a vertically moving valve disk loosely mounted on the plunger stem between said rod-head and the upper plunger disk and provided with opposite upwardly projecting guide stems extended from opposite edges thereof and moving
 75 in said bifurcated guide ears, substantially as set forth.

2. In a pump, the combination with a cylinder having a lower valve seat, of a removable valve holder adapted to loosely register
 80 with the cylinder and comprising opposite vertical arms, an upper connecting end bar and a transverse guide bar provided with opposite guide openings or slots, retaining bow springs secured to the side arms of the holder
 85 and contacting with the sides of the cylinder, a disk valve working over said valve seat and having opposite vertical guide stems moving in said guide openings or slots, stop pins secured in said stems above the guide bar, and
 90 the valved plunger having an extended stem moving through the upper connecting end bar and provided with a lifting nut, substantially as set forth.

In testimony that we claim the foregoing as
 95 our own we have hereto affixed our signatures in the presence of two witnesses.

SAMUEL M. FULTON.
 ALDEN THAYER AMES.

Witnesses:

C. W. McLAUGHLIN,
 ALEX. MONTAGUE.