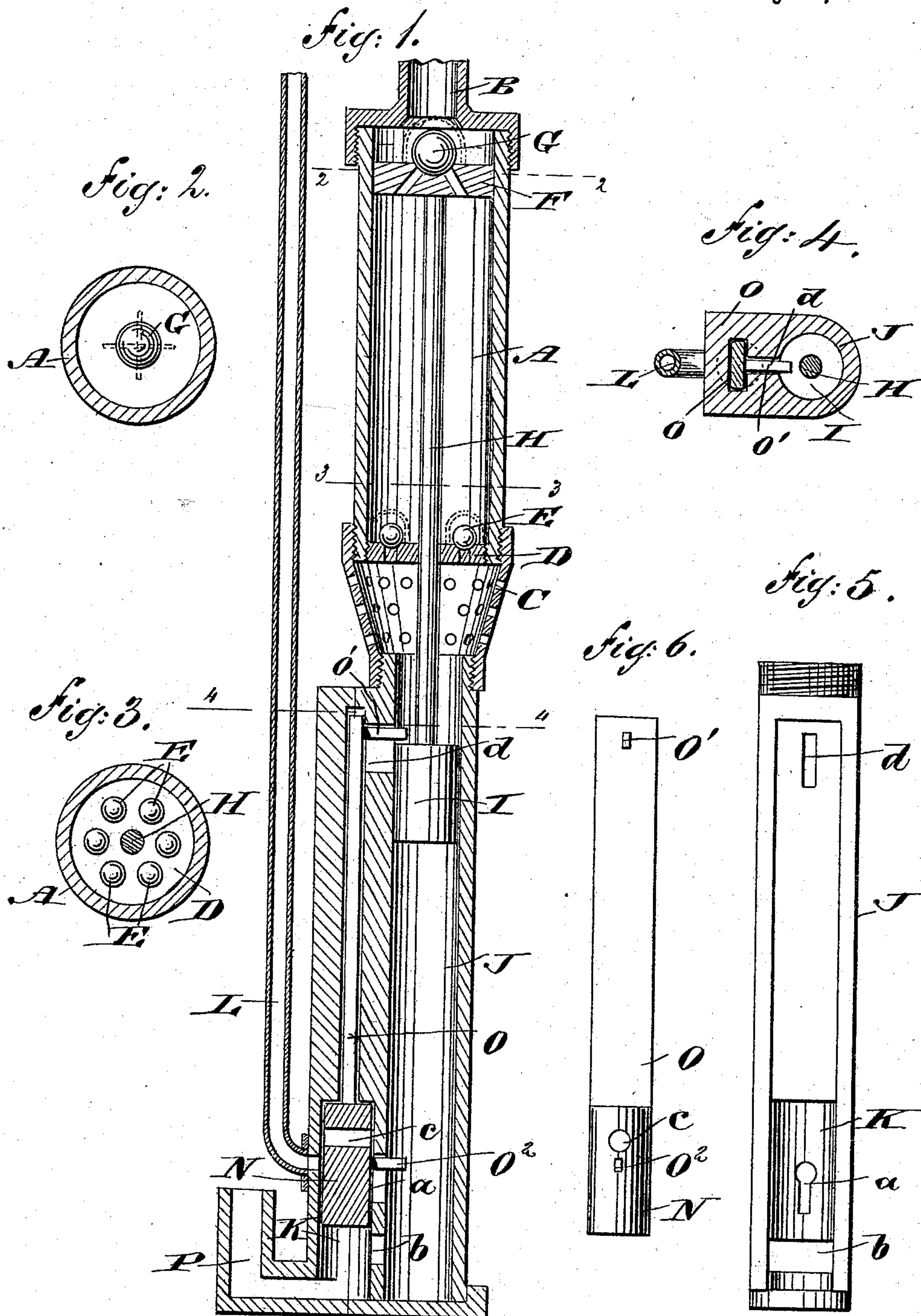


(No Model.)

C. S. COX.
PUMP.

No. 500,856.

Patented July 4, 1893.



WITNESSES:

Chas. Vida.
C. Sedgwick

INVENTOR.

C. S. Cox
BY Munn & Co
ATTORNEYS.

UNITED STATES PATENT OFFICE.

CARY S. COX, OF SPOTTISWOOD, CALIFORNIA.

PUMP.

SPECIFICATION forming part of Letters Patent No. 500,856, dated July 4, 1893.

Application filed July 12, 1892. Serial No. 439,775. (No model.)

To all whom it may concern:

Be it known that I, CARY S. COX, of Spottiswood, in the county of Kern and State of California, have invented a new and Improved Pump, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved well pump, which is simple and durable in construction, very effective in operation and more especially designed for deep wells.

The invention consists of certain parts and details and combinations of the same, as will be hereinafter described and then pointed out in the claim.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement. Fig. 2 is a sectional plan view of the pump cylinder and plunger valve therein, on the line 2—2 of Fig. 1. Fig. 3 is a sectional plan view of the pump cylinder on the line 3—3 of Fig. 1. Fig. 4 is a sectional plan view of the auxiliary cylinder and valve chest, on the line 4—4 of Fig. 1. Fig. 5 is a face view of the steam chest with the cover removed; and Fig. 6 is a side elevation of the slide valve.

The improved deep well pump is provided with a cylinder A, connected at its upper end with the outlet pipe B, extending upwardly to the surface of the ground to discharge the water as hereinafter more fully described.

On the lower end of the cylinder A is secured a perforated inlet C, through which water enters from the well to pass through the perforated bottom D, of the cylinder A, the said perforated bottom being provided with the usual valves E, closing the perforations on the down stroke of the plunger valve F, held in the said cylinder A. The plunger valve F is provided with a valve seat on its upper surface and with the openings leading from the seat through the plunger. A ball valve G, which opens on the downward stroke of the piston to permit water to pass from the lower part of the cylinder A to the upper part of the same is held on the plunger by a cage. On the upward stroke of the plunger valve F, the valve G closes so that the water in the up-

per part of the cylinder is forced out through the outlet pipe B.

The piston rod H, of the plunger valve F extends through the bottom D and the inlet C to connect with a piston I, mounted to slide in an auxiliary cylinder J, attached to the lower end of the inlet C, so as to form part of the pump cylinder A. In one side of this auxiliary cylinder J is arranged a steam chest K, connected with a pipe L, extending upward to the surface of the ground to connect at its outer end with a suitable source of motive agent supply. In this steam chest K is mounted to slide a slide valve N, controlling the inlet port *a* and the exhaust port *b* formed in the wall of the cylinder J. A port *c* is formed in the valve N to connect the supply pipe L with the port *a* to permit the motive agent to enter the lower part of the auxiliary cylinder J.

The valve N is provided with a flat valve stem O, extending upwardly and provided near its upper end with a pin O', extending through a slot *d* into the upper end of the cylinder J. A similar pin O² projects from the valve N through the port *a* into the cylinder, the said pins O' and O² being alternately engaged by the piston I on the up and down stroke of the latter so as to shift the valve N, as hereinafter described. The lower part of the steam chest K is connected with an outlet pipe P opening into the well.

The operation is as follows: When the valve N is in such a position as to connect by its port *c*, the supply pipe L with the port *a*, then the motive agent passes from the supply pipe into the lower end of the cylinder J to force the piston I therein upward. When the piston I nears the uppermost end of its stroke, it engages the pin O', thus lifting the stem O and consequently the valve N, whereby the port *c* is disconnected from the port *a* and the supply pipe L. The motive agent is thus cut off from the lower end of the cylinder, and at the same time the valve N opens the port *b* and the exhaust can take place through the said port *b* and exhaust pipe P. When the piston I moves upward then the water contained in the upper end of the pump cylinder A is pushed out through the outlet pipe B, and at the same time, water is drawn into the lower end of the pump cylinder A, through

the inlet C and the openings in the perforated bottom D. As soon as the motive agent is cut off, as above described, then the weight of the plunger valve F causes the latter to descend 5 so that the piston I also moves downward. During the downward movement of the plunger valve F the valve G therein opens to permit the water contained in the cylinder A to flow to the top of the piston and when the latter finally 10 nears the lower end of its return stroke, then the piston I likewise moves to a lowermost position and engages the pin O² and finally shifts the valve N downward so that the port c again registers with the port a 15 and the supply pipe L to permit the motive agent to again enter the lower end of the auxiliary cylinder J. The motive agent now forces the piston I upward thus lifting the plunger valve F to discharge the water, as 20 above described. The operation is then repeated in the manner set forth.

It is to be understood that during the time the valve N is in a lowermost position, the ex-

haust port b is cut off by the said valve N so that the motive agent only acts on the piston I and forces the same upward. 25

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

In a pump, the combination with a pump 30 cylinder and a plunger valve therein, of the auxiliary cylinder J depending from the pump cylinder and provided with the ports a b and slot d, the piston I in the auxiliary cylinder and secured to the plunger valve rod H, the 35 chest K connected with the supply pipe L, and the slide valve N in the chest and provided with the pin O² projecting through port a, and the valve stem O having the pin o' extending through the slot d, substantially as 40 herein shown and described.

CARY S. COX.

Witnesses:

J. G. PORTER,
A. W. JACKSON.