

(No Model.)

L. L. BETTYS.

PUMP.

No. 359,764.

Patented Mar. 22, 1887.

Fig. 1.

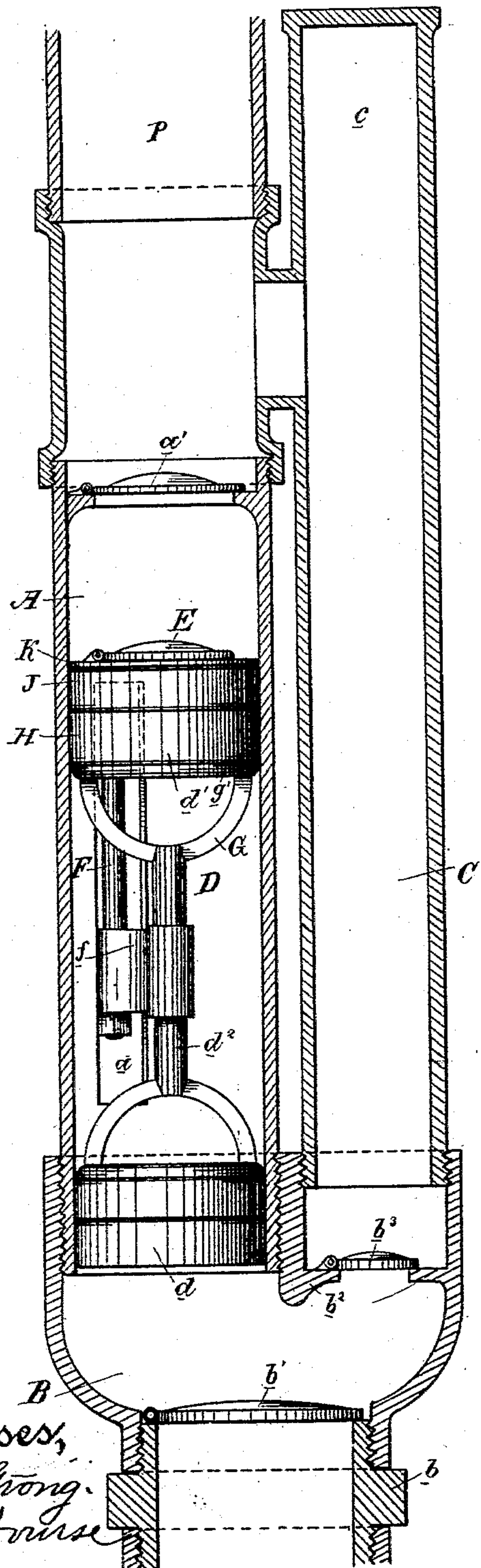
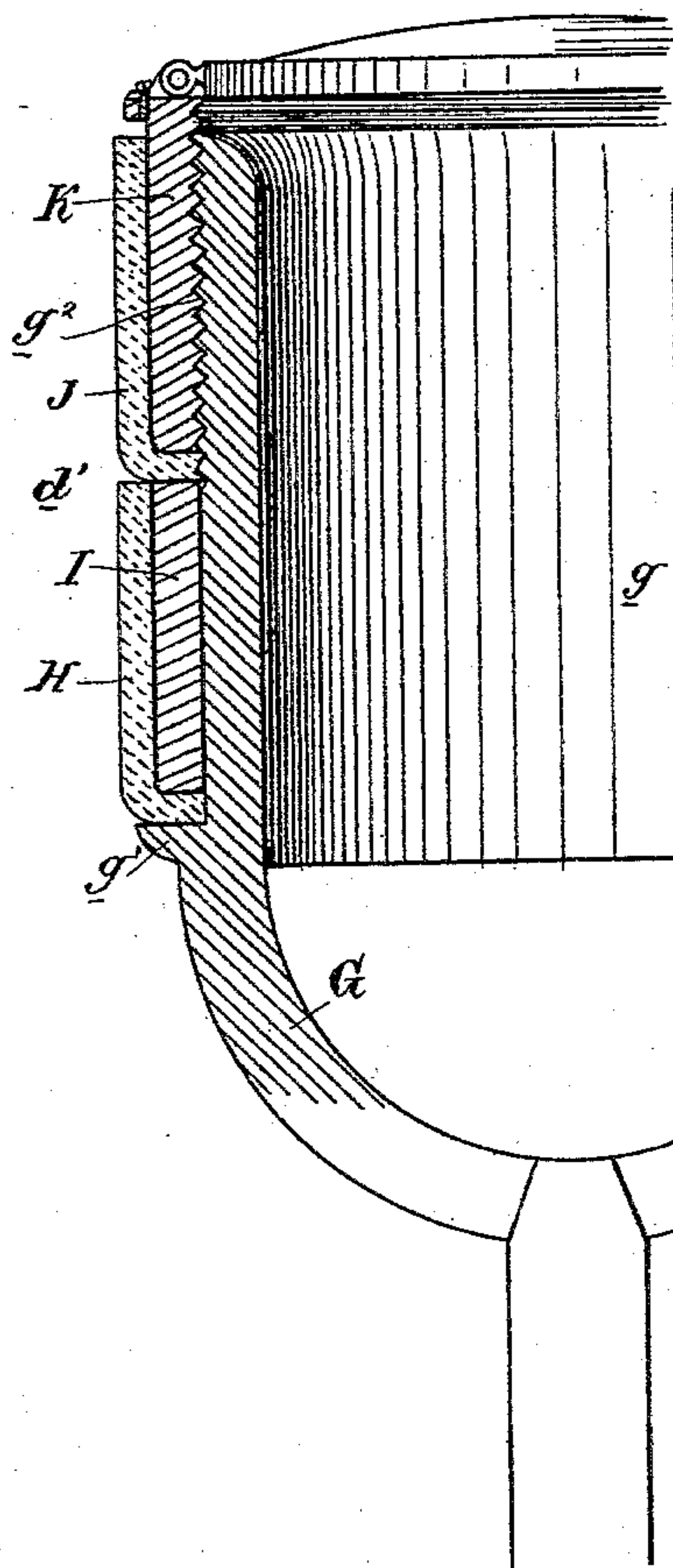


Fig. 2.



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PUMP.

SPECIFICATION forming part of Letters Patent No. 359,764, dated March 22, 1887.

Application filed April 15, 1886. Serial No. 199,027. (No model.)

To all whom it may concern:

Be it known that I, LAFAYETTE L. BETTYS, of Mountain View, county of Santa Clara, State of California, have invented an Improvement in Pumps; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to the class of pumps, and particularly to that class which are known as "submerged" or "deep-well" pumps.

My invention consists of a cylinder receiving water through independent ports—one in its base and the other in its side—a double plunger having one of its heads solid, and adapted to operate in connection with the lower entrance-port of the cylinder, and its other head hollow and provided with a valve, said head being adapted to operate in connection with the side entrance-port of the cylinder, a side pipe in communication below with the base of the cylinder and with the discharge-pipe above, a valve controlling the entrance to the side pipe, a valve in the cylinder controlling its communication with the discharge-pipe, and various details of construction, all of which I shall hereinafter fully describe.

The object of my invention is to provide a simple and effective double-acting deep-well pump.

Referring to the accompanying drawings, Figure 1 is a vertical section of my pump. Fig. 2 is a section of the upper hollow head of the plunger.

A is the main cylinder of the pump, to the lower end of which is fitted a U-shaped casting or head, B, into one arm of which the cylinder is screwed, and into the other arm of which the side pipe, C, is screwed. The base of the head B has threaded into it a hollow nut, *b*, the top of which serves as a seat for the upwardly-opening valve *b'*. The smaller arm of the head B has a flange, *b''*, forming a seat for an upwardly-opening valve, *b'''*.

D is a double plunger. It consists of a lower head, *d*, an upper head, *d'*, and a stem, *d''*, uniting the two heads. The upper head is a hollow one, provided on its top with an upwardly-swinging valve, E. The lower head is a solid one. An aperture or port, *a*, is made in opposite sides of the cylinder, and

through one of these extends the arm *f*, which is connected at its inner end with the stem of the plunger and at its outer end with a rod, F, forming a pitman by which the plunger is reciprocated. Within the cylinder, and just above the upper limit of the stroke of the plunger, is an upwardly-swinging valve, *a'*, which controls the communication of said cylinder with the discharge-pipe P. The upper end of the side pipe, C, communicates with the discharge-pipe above the valve *a'*, and it has an air-chamber, *c*, on top. The advantage of this air-chamber, located in the position shown, is important. Usually air-chambers are located at the surface, and their air is compressed by the water being forced directly into them. This force must be a constant one, in order to keep up the required compression in the chamber, and the said force must be supplied directly by the pump-operating power; but by locating the air-chamber down as low as possible in the well the air is compressed by the weight of the column of water resting in the discharge-pipe, and its compression is therefore automatic, and relieves the main power to that extent. The compression force is also constant, as when the pump is in operation there is always the column of water in the discharge-pipe. The peculiar manner in which I attach the packing of the upper head of the plunger is shown in Fig. 2. The upper end of the stem is forked into a yoke, G, which terminates in a ring, *g*, having at its base a shoulder, *g'*, and at its top an externally-threaded portion, *g''*.

H is a cup-leather, the inwardly-turned base of which rests upon the shoulder *g'*.

I is a metal band which lies between the cup-leather and the ring, its base being upon the base-flange of the cup-leather, and its top flush with the top of said leather.

J is a second cup-leather, the base of which rests upon the top of the lower cup-leather and the band I.

K is a screw-gland, which is seated on the threaded top *g''* of the ring *g*. By turning this gland down it binds all the parts together. The top of the gland forms the seat for the valve E.

The operation of my pump is as follows: On the upstroke water is taken in through the

bottom valve, b' . On the downstroke that water is forced up through valve b^3 into the side pipe, C, and at the same time water is taken in through the side ports, a , and passes
 5 up through the hollow head d' , and through its valve E into the upper portion of the cylinder. On the upstroke again the water is taken in through the bottom valve, b' , while the water which was above the upper head of
 10 the plunger is forced up through valve a' into the discharge-pipe. It will thus be seen that the pump is practically two single-acting pumps, each drawing its water through independent ports. The check-valves in both the
 15 cylinder and casting head B are placed as close to the limits of the plunger-stroke as possible, in order to drive all the water out at each stroke.

I am aware that pumps are known in which
 20 a side pipe is used, and that a double-headed plunger is also known; but I am not aware that any such plunger has been made with a solid head drawing its water from one port and a hollow head drawing its water from another and independent port.
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Having thus described my invention, what I claim as new, and desire to protect by Letters Patent, is—

1. In a pump, a cylinder having a valved
 30 port below and an independent port in its side, in combination with a plunger within the cylinder, said plunger having a lower solid head for taking water through the bottom port and an upper hollow head with control-

ling-valve for taking water through the side 35 port, substantially as described.

2. In a pump, the cylinder A, having a side port, a , the side pipe, C, communicating below with the base of the cylinder and above with the common discharge-pipe, a valved entrance-port for the base of the cylinder, a valve
 40 in its upper portion controlling the entrance to the discharge-pipe, and a valve controlling the communication between the cylinder and side pipe, in combination with the plunger D, 45 having a lower solid head and an upper hollow head with a valve, substantially as described.

3. In a pump, the cylinder A, having an aperture or port, a , in its side, the casting or head B on the base of the cylinder, and having
 50 an entrance-port controlled by a valve, b' , the side pipe, C, fitted to the casting and communicating above with the common discharge-pipe, the valve b^3 , controlling the entrance to the side pipe, and the valve a' , controlling the
 55 communication of the cylinder with the discharge-pipe, in combination with the plunger D, having a lower solid head, d , and an upper hollow head, d' , provided with a top valve, E, all arranged and adapted to operate substantially as described.
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In witness whereof I have hereunto set my hand.

LAFAYETTE L. BETTYS.

Witnesses:

S. H. NOURSE,
 H. C. LEE.