(No Model.)

E. R. HILL.

PUMP.

No. 492,678. Patented Feb. 28, 1893.

Fig. 1.

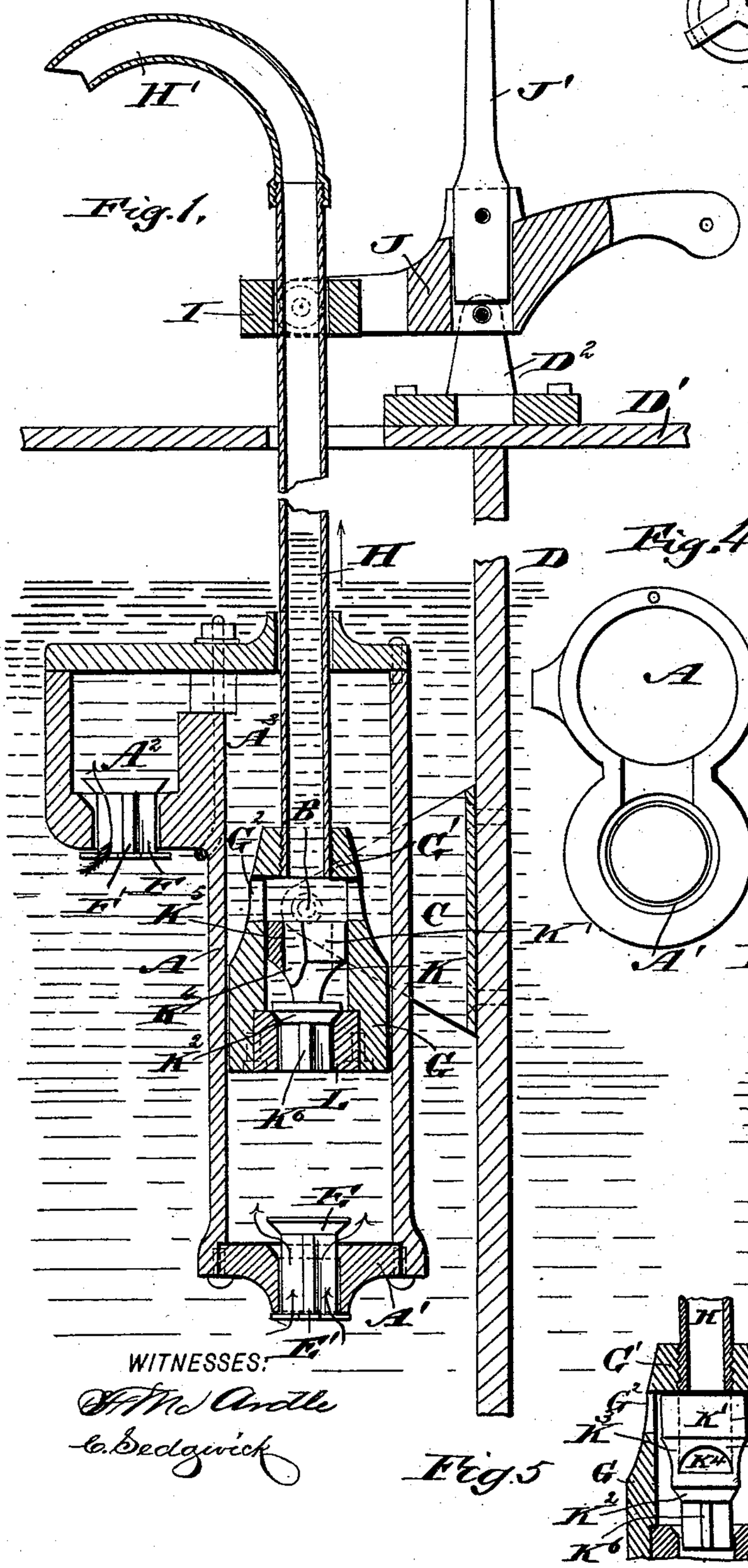

Fig. 3.

Fig. 4.

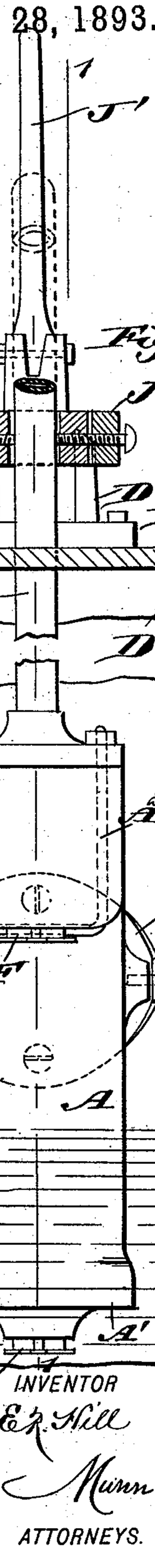

Fig. 5.

WITNESSES:

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ELIJAH R. HILL, OF NEW ALBANY, MISSISSIPPI.

PUMP.

SPECIFICATION forming part of Letters Patent No. 492,678, dated February 28, 1893.

Application filed June 17, 1892. Serial No. 437,030. (No model.)

To all whom it may concern:

Be it known that I, ELIJAH R. HILL, of New Albany, in the county of Union and State of Mississippi, 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 double-acting pump, which is simple and durable in construction, very effective in operation, and arranged to cause a steady flow of the water while the pump is in use.

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

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, on the line 1—1 of Fig. 2. Fig. 2 is a front view of the same, with parts in section. Fig. 3 is an inverted plan view of one of the suction valves. Fig. 4 is a plan view of the cylinder with the head removed; and Fig. 5 is a side elevation of the piston valve, with the piston in vertical section.

The improved pump is provided with a cylinder A, hung at or near its middle on trunnions B, supported in a bracket C, attached to a board D, extending into the well from a platform D′, covering the upper end of the well. In the lower head A′, of the cylinder A is fitted a suction valve E, adapted to open upwardly to permit the water to flow from the well into the lower part of the cylinder A on the upward stroke of the piston in the cylinder A. A second suction valve F is arranged in an offset A^2, formed on the upper end of the cylinder A and connected with the interior upper end of the said cylinder by means of a port A^3. In the cylinder A is fitted to slide a main piston G, made hollow and connected at its upper reduced end G′, with a hollow piston rod H, which forms the discharge pipe for the pump, the said piston rod extending upwardly through an opening in the platform D′ to the outside of the well, the outer end of the piston rod being provided with the usual bend H′, through which the water passes into the receptacle to be filled.

The outer end of the piston rod H is provided with a collar I, pivotally connected with the forked end of a lever J, fulcrumed on a bracket D^2, secured to the platform D′. A handle J′, is connected with this lever for imparting a swinging motion to the latter so as to actuate the piston G in the cylinder A. Within the hollow piston G is mounted to slide a piston valve K, formed on its upper end with the piston K′, adapted to open and close ports or openings G^2, formed in the upper reduced end G′ of the piston G. The piston valve K is also provided with a valve K^2, adapted to be seated on a seat L, secured in the bottom of the piston K so that when the valve is unseated water can flow from the lower part of the cylinder through the seat L into the hollow piston G.

The valve K^2 is somewhat less in diameter than the piston K′ and is connected with the latter by the shank K^3, formed with openings K^4, leading to a central opening K^5, formed in the piston K′ and in part of the stem K^3, as will be readily understood by reference to Figs. 1 and 5. Thus, the water passing from the lower part of the cylinder through the seat L into the lower part of the hollow opening in the piston G can pass through the openings K^4 into the central opening K^5 and from the latter into the upper part of the hollow piston G to finally pass into the hollow piston rod H. The valves E and F are provided at their lower ends with crosses E′ and F′, respectively, serving to limit the upward sliding movement of the valves. The valve K^2 of the piston valve K is formed with a cross K^6, fitted into the opening of the valve seat L so as to guide the lower part of the piston valve.

The operation is as follows: When the several parts are in the position shown in the drawings, the cylinder A is conveniently immersed in the water and when the operator moves the handle J′ in the direction of the arrow *a*′, then the piston G is caused to slide upward so that the valve E is unseated and water can flow from the well through the head A′ into the lower part of the cylinder A. When the handle J′ is moved in the opposite direction of the arrow *a*′ then the piston G slides downward against the water contained in the lower part of the cylinder A so that the valve E seats itself and prevents water

from passing out of the head A′ of the cylinder. The downward motion of the piston G against the body of water in the lower part of the cylinder causes the piston K to slide upward so that the valve K^2 is unseated from the seat L and the piston K′ of the said piston valve closes the inlet openings G^2 for the upper part of the cylinder A. As the openings G^2 are closed by the piston valve, a suction is formed in the upper part of the cylinder A so that the valve F opens and water flows from the well past the said valve F into the offset A^2 and from the latter through the port A^3 into the upper part of the cylinder. On the downward stroke of the piston G, the water will flow from the lower part of the cylinder through the seat L into the hollow piston G and from the latter through the piston valve into the piston H to be discharged at the upper end thereof. When the piston G is on the return stroke, that is, moves upwardly, then the piston valve K moves downward until the valve K^2 is seated on the seat L and its piston K′ has opened the openings G^2. The water previously sucked into the upper end of the cylinder A now passes from the latter through the openings G^2 into the upper part of the hollow piston G to finally pass through the hollow piston rod H and its outlet H′ to the vessel to be filled.

It is understood that when the piston G moves upward, the valve F seats itself so that the water must flow into the hollow piston G, as above described. Thus, it will be seen that a continuous flow of the liquid is obtained as the piston G discharges the water through its piston rod H on both the up and down strokes of the piston. The cylinder A is mounted to oscillate so as to prevent undue friction of the piston rod H in the bearings of the cylinder.

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

1. A pump provided with a main piston made hollow and formed at its bottom with a valve seat and at its upper reduced end with inlet openings, and a piston valve fitted to slide in the said hollow piston and formed with a valve adapted to be seated on the said seat in the main piston, the said piston valve being also provided with a piston adapted to close the inlet openings in the reduced end of the main piston substantially as shown and described.

2. In a pump, the combination with an oscillating cylinder provided in its ends with suction valves opening upwardly, a main hollow piston fitted to slide in the said cylinder and provided in its bottom with a valve seat and in its upper reduced end with inlet openings, a hollow piston rod connected with the reduced end of the said main piston and forming a discharge pipe, and a piston valve fitted to slide in the said main hollow piston and provided with a valve adapted to be seated on the seat in the said main piston, and also provided with a piston adapted to close the inlet openings in the upper reduced end of the said main piston, substantially as shown and described.

ELIJAH R. HILL.

Witnesses:
SAM. D. OWEN,
W. B. ROBBINS.