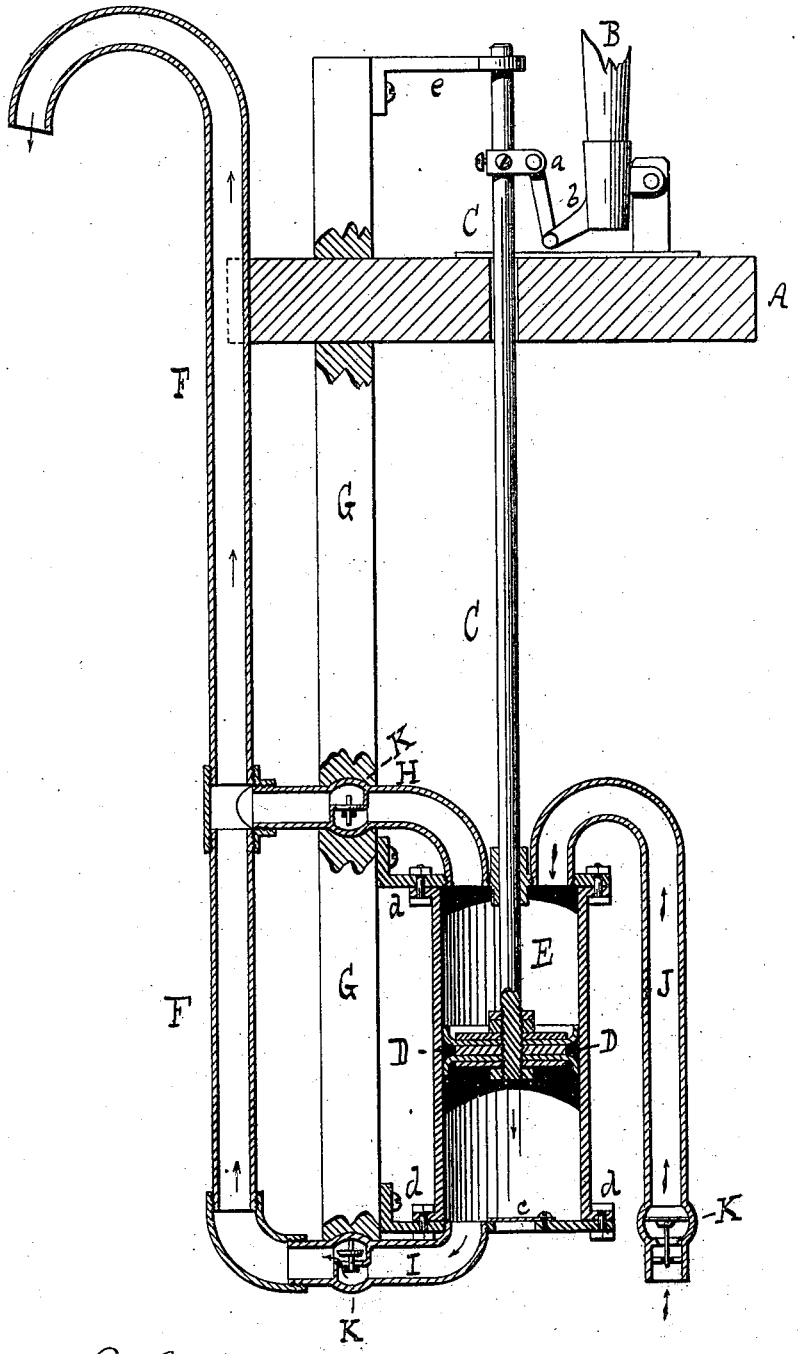
R. P. CAMMACK & C. A. RAY.

PUMPS.

No. 193,689. Patented July 31, 1877



ATTEST.

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UNITED STATES PATENT OFFICE.

RICE P. CAMMACK AND CHARLES A. RAY, OF LOUISA COURT-HOUSE, VA.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **193,689**, dated July 31, 1877; application filed June 20, 1877.

To all whom it may concern:

Be it known that we, RICE P. CAMMACK and CHARLES A. RAY, of Louisa Court-House, in the county of Louisa, in the State of Virginia, have invented an Improvement in Pumps; and declare the following to be a specification thereof, reference being made to the accompanying drawing, which is a vertical section of our invention.

Our invention relates to cylinder-pumps; and consists in making the discharge-pipe stationary and connecting the same with the cylinder by two pipes, one entering the cylinder at its top and the other entering the cylinder at its bottom; and also in furnishing a supplemental pipe, the upper end of which enters the cylinder at the top, while its lower end is open to the water.

By check-valves in these pipes and the alternate motion of the piston in the cylinder a constant discharge of water is obtained at both the upward and downward stroke of the piston.

Upon the platform A is affixed the handle B and its connections *a b*, as usual, to operate the rod C and the piston D. The cylinder E has a flap-valve, *c*, as usual, and is sustained by the frame *d*. Both the cylinder E and the discharge-pipe F are permanently fixed to the post G. A guide, *e*, extends from the post G, and terminates in a loop or eye, through which the rod C is steadied in its movement. The pipes H and I branch from the pipe F and enter the cylinder E, the former at the top and the latter at the bottom. The supplemental pipe J enters the cylinder E above and opens into the water below. In each of the pipes H, I, and J there is a check-valve, K, of any suitable construction.

By use of the pipe J, opening to the water at its lower end, which is even with the bottom of the cylinder, our pump will work well in shallow water, and it is not necessary that the whole cylinder should be submerged, as it would be if the supply of water above the piston were to flow in directly through a valve in the top of the cylinder.

The pump thus obtains water from two external openings through the flap-valve *c* and through the pipe J, and, by means of this contrivance and the use of said check-valves, is a double-acting pump, delivering a continuous flow of water. It is less liable to wear out than the pumps hitherto used, is cheaper in construction, and much easier to operate.

In the usual form of submerged cylinder-pumps the whole discharge-pipe itself is lifted at each downstroke of the handle, so that much strength is required to work the pump, especially in deep wells; but in our invention the discharge-pipe is not thus lifted, but is permanently attached to the post G, and the only power necessary is to raise the rod and piston, however deep the well may be.

The operation of our improved pump is as follows: The drawing represents the position of the parts at the half-way point of the downstroke of the piston. This has occasioned a vacuum in the upper part of the cylinder and the pipe J. The check-valve K in the pipe J is drawn up from its seat, and the water is sucked up through the pipe J, and fills the upper portion of the cylinder. At the same time this suction has drawn into its seat the check-valve K in the pipe H and closed it. The water in the lower part of the cylinder is being forced out through the pipe I into the discharge-pipe F, crowding the check-valve K in the pipe I out of its seat, to allow the flow of water past it. The downward pressure of the water has also shut down the flap-valve *c* and closed that aperture. When the upstroke of the piston begins the upper part of the cylinder is filled with water, which, as the piston rises, is forced through the pipe H, past the check-valve therein, and into the discharge-pipe F, while the flow out of the pipe J is prevented by the check-valve therein, which is now crowded back into its seat by the pressure of the water. Below the piston the suction closes the check-valve in the pipe I, and, opening the flap-valve *c*, fills the lower part of the cylinder with water again.

We claim as a novel and useful invention, and desire to secure by Letters Patent—

The pipes F, H, I, and J, having their check-valves K K K, in combination with the barrel or cylinder of a pump, substantially as and for the purpose specified.

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