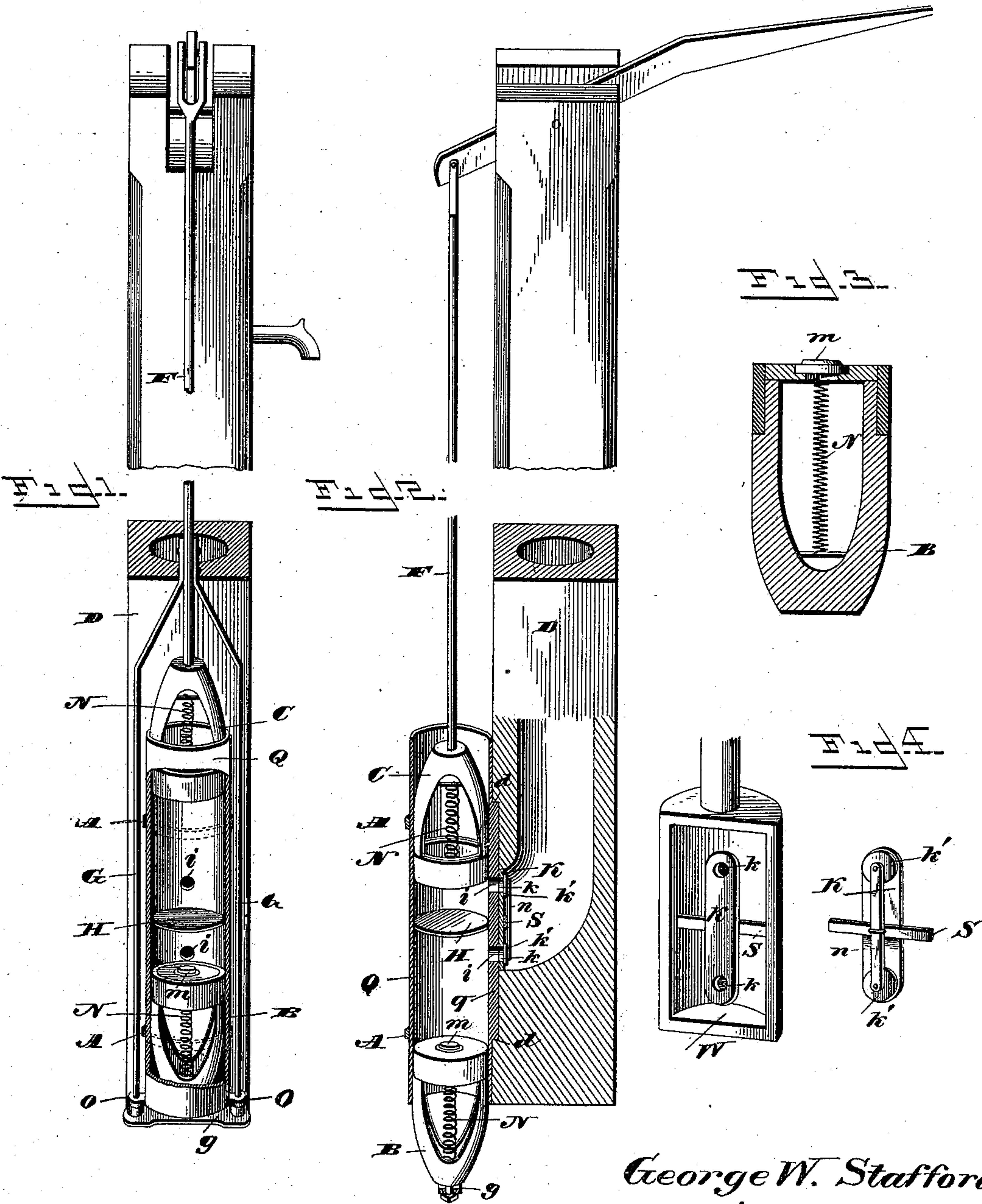


(No Model.)

G. W. STAFFORD.
PUMP.

No. 401,979.

Patented Apr. 23, 1889.



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PUMP.

SPECIFICATION forming part of Letters Patent No. 401,979, dated April 23, 1889.

Application filed April 16, 1887. Serial No. 235,127. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WHITEFIELD STAFFORD, a citizen of the United States, residing at Postville, in the county of Allamakee and State of Iowa, have invented certain new and useful Improvements in Pump-Cylinders, of which the following is a specification.

This invention relates to that class of double-acting pumps in which the piston works below the surface of the water in the well or reservoir to which the pump is applied—in other words, a double-acting submerged pump.

The object of the invention is to provide means by which the ordinary iron or wooden pump-stock now in use may be, without expensive fitting, used as a double-acting pump.

To this end the invention consists in novel features of construction and combinations, which will be described and claimed hereinafter.

In the accompanying drawings, Figure 1 is a perspective view showing my improved cylinder secured to a wooden pump-stock. Fig. 2 is a similar view, partly in section, looking in another direction. Fig. 3 is a vertical section of the lower piston or bucket. Fig. 4 is a detail perspective of a water-chest used in connection with a metal pump-stock.

An open-ended tube or cylinder, Q, is provided interiorly about midway of its length with a permanently-fixed imperforate diaphragm, H, small discharge-openings *i* being formed in the walls of the cylinder immediately above and below said diaphragm, as shown. Secured to or forming part of that side of the cylinder in which the discharge-openings *i* are formed is a flat-surfaced block, *g*, of a width equal to the diameter of the cylinder Q, the flat surface of said block projecting slightly beyond the surface of the cylinder to fit within a correspondingly-shaped recess or opening, *d*, in the water-chest of the pump-stock D, as illustrated in Figs. 2 and 4.

It will be understood that, so far as my improved cylinder is concerned, it matters not whether a wooden or metallic pump-stock be used, as in both instances water is discharged through the openings *i* of the cylinder into a water-chamber, W, secured to or formed with the pump-stock, and rises from said chamber to the discharge-spout of the pump. Within

this water-chamber W is secured a cross-bar, S, to the face of which is secured a vertical plate, K, provided at its ends with apertures *k*, arranged to register with the discharge-openings *i* in the cylinder. Spring-pressed valves *k'* are secured at the back of the plate K to close the apertures *k* therein, and I prefer, for the sake of simplicity and convenience, to arrange the valve and spring as shown in the drawings—that is, to mount the valves on opposite ends of a plate-spring, *n*, of proper length, the spring being secured at its center to the back of the cross-bar S by a staple or other well-known means.

The cylinder Q is secured to the side of the pump-stock below the water-level in the well or reservoir by suitable straps or shackles, A, and is provided with perforated lugs O, projecting from opposite sides and preferably near the bottom.

The pump-rod F, which may be operated by any well-known device—as, for instance, the lever E shown—carries two pistons, B and C, occupying, respectively, the lower and upper chambers of the cylinder Q. The upper piston, C, is secured directly to the lower end of the pump-rod F, while the lower piston is carried by a stirrup consisting of the side rods or arch, G, and foot-piece *g*. This stirrup is at its upper end secured to the pump-rod F at a sufficient distance above the upper piston, C, to permit of a full stroke of the latter within the upper chamber of the cylinder Q, the side rods, G, passing from their point of attachment to the pump-rod F down on opposite sides of the cylinder Q and through the apertures in the guide-lugs O, as shown, the lower piston being secured to the center of the foot-piece *g* by a bolt and nut, as shown.

The pistons comprise a hollow conoidal body open at opposite sides and provided at the larger or working end with an outwardly-opening valve, *m*, held normally to its seat by a light coiled spring, N, secured at one end to the inner surface of the valve and at its opposite end within the smaller end of the piston-body.

The larger or working end of the piston is recessed to receive a packing formed from a disk of leather crimped or shaped to fit said end of the piston.

I claim—

1. In a pump of the character described, the combination of the pump stock or tube provided at its lower end with a water-chamber, 5 an open-ended cylinder rigidly secured to said stock to close the open side of said chamber and provided with two openings, *i*, communicating therewith, an imperforate diaphragm secured within the cylinder between said open- 10 ings, a pump-rod carrying two valved pistons, one for each chamber of the cylinder, and a single plate-spring arranged within the water-chamber of the pump-stock and provided at each end with a valve to close the openings 15 *i* of the cylinder, substantially as described.

2. In combination with a pump stock or tube having a water-chamber at its lower end, an

open-ended cylinder provided at one side with a block provided with projecting edges which fit snugly within the open side of said water- 20 chamber, a diaphragm secured centrally within the cylinder, a discharge-opening above and below the diaphragm leading to the water-chamber, a single spring within the water-chamber provided at each end with a valve to 25 close said discharge-openings, and valved pistons arranged one in each end of the cylinder and connected with a single pump-rod, substantially as described.

GEORGE WHITEFIELD STAFFORD.

Witnesses:

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