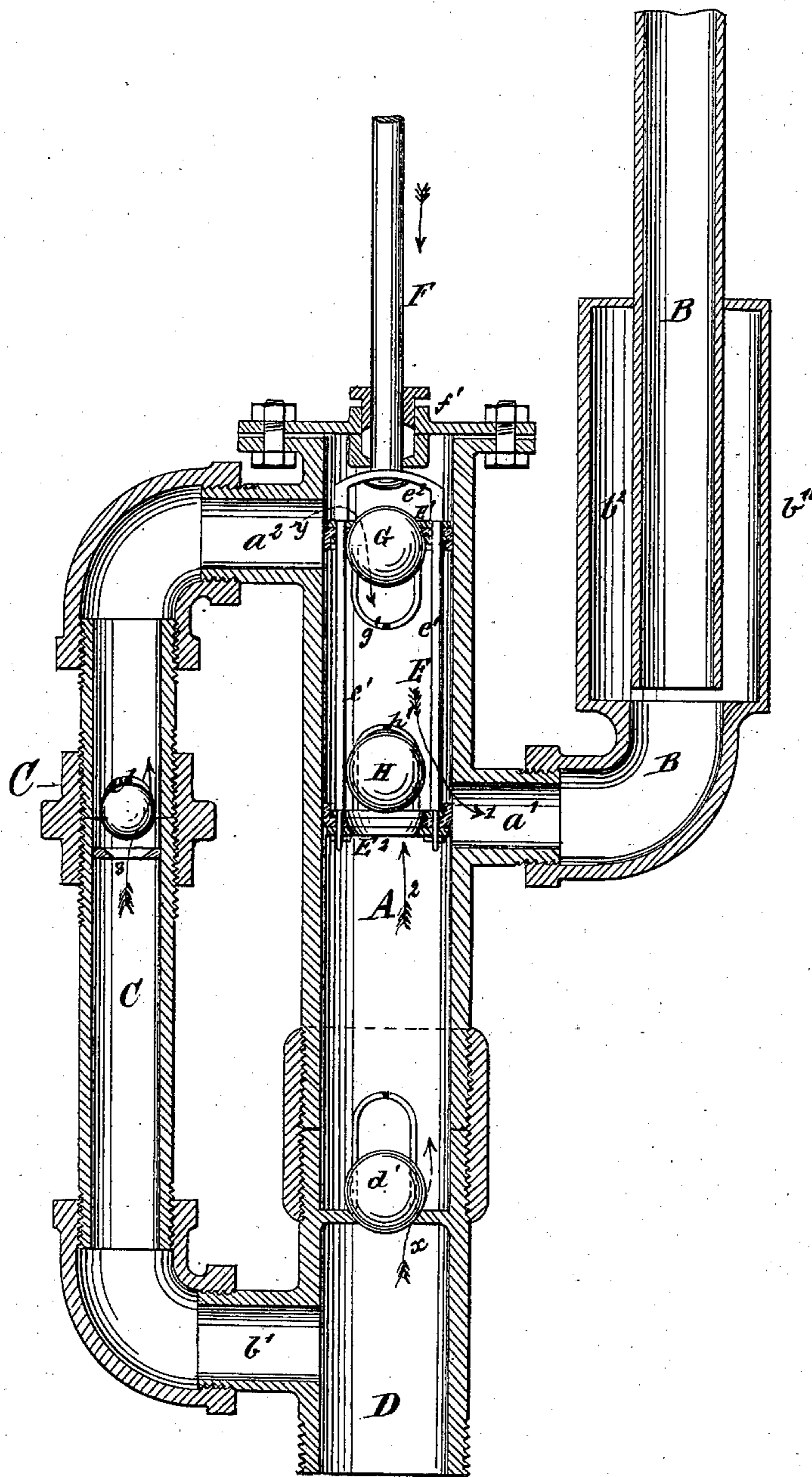


W. M. WHITELEY.  
Double-Acting Pump.

No. 198,062.

Patented Dec. 11, 1877.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

WILLIAM M. WHITELEY, OF JOPLIN, MISSOURI.

## IMPROVEMENT IN DOUBLE-ACTING PUMPS.

Specification forming part of Letters Patent No. **198,062**, dated December 11, 1877; application filed November 13, 1877.

*To all whom it may concern:*

Be it known that I, WILLIAM M. WHITELEY, of Joplin, in the county of Jasper and State of Missouri, have invented a new and useful Improvement in Mining, Well, and Fire Pump, of which the following is a specification:

The object of my invention is to provide an improved double-acting force and lift pump, for mining and other purposes.

The invention consists in the construction and combination of a double-valved piston with two valved suction-pipes and a discharge-pipe, as will be hereinafter described.

The accompanying drawing represents a vertical section of this my improved double-acting pump.

A is the pump-barrel, connected at its lower end, in a straight line with the main suction-pipe D, at its middle, or thereabout, by a nipple,  $a^1$ , to the discharge-pipe B, and at its upper end by a nipple,  $a^2$ , to the upper end of an auxiliary suction-pipe, C, the lower end of which latter is attached by a nipple,  $b^1$ , to the main suction-pipe D.

E is the piston, formed of one upper and one lower piston-head,  $E^1 E^2$ , secured on the two bars  $e^1$  of a cross-head,  $e^2$ , fastened to the lower end of the piston-rod F, the latter working in a stuffing-box in the top  $f'$  of the pump-barrel, as usual. The piston-heads  $E^1 E^2$  are each provided with two diametrically-opposite holes for the reception of the bars  $e^1$ , on which they are slid up to lodge against shoulders formed on the bars  $e^1$ , and then secured, the upper one by pins, the lower one by nuts, or by other means.

The piston-heads are perforated, and each formed of two metallic plates, one of which has a valve-seat, clamping between them a leather packing, the circular outer edge of which latter is bent over the edge of one of the metallic plates to form the packing between it and the inner surface of the pump-barrel. Each piston-head has a ball-valve, G H, both arranged to open inward the piston—that is, toward the center of the space between the two piston-

heads—and kept in place by bails  $g' h'$ . The suction-pipes D C are provided with similar inward-opening globular check-valves  $d' c'$ , kept in place by a bail like those of the valves G H.

$b^2$  is an enlargement surrounding and communicating with the pipe B, to serve as air-vessels for the pump.

The operation is as follows: On the downward stroke, as shown in the drawing, the valves G  $d'$  are closed, and the valves H  $c'$  are open, and a volume of water equal to the capacity of the hollow piston is discharged in direction of arrow 1, while the piston gets filled again, as indicated by arrow 2, with the water in the lower end of the pump-barrel, and its previous place at the upper end gets filled from the auxiliary suction-pipe C through valve  $c'$ , as indicated by arrow 3. On the upward stroke of the piston the valves H  $c'$  are closed, the valves G  $d'$  are open, another volume equal to that of the piston is discharged in direction of arrow 1, while the water in the upper end of the barrel A enters and fills the piston, as indicated by arrow  $y$ , and a new volume enters the barrel from the main suction-pipe D, through the valve  $d'$ , as indicated by the arrow  $x$ .

The pump is thus a complete double-acting lift and force pump. A great advantage is the double suction, thus taking up double the amount of water of usual pumps, and by short strokes throwing as much as by long ones, thus making it practical in all forms of pumping, vertical or horizontal.

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

The double-valved piston E, in combination with the pump-barrel A, suction-pipes D C, and discharge-pipe B, the whole constructed and operating substantially as and for the purpose specified.

WILLIAM MAREDDITH WHITELEY.

Witnesses:

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