

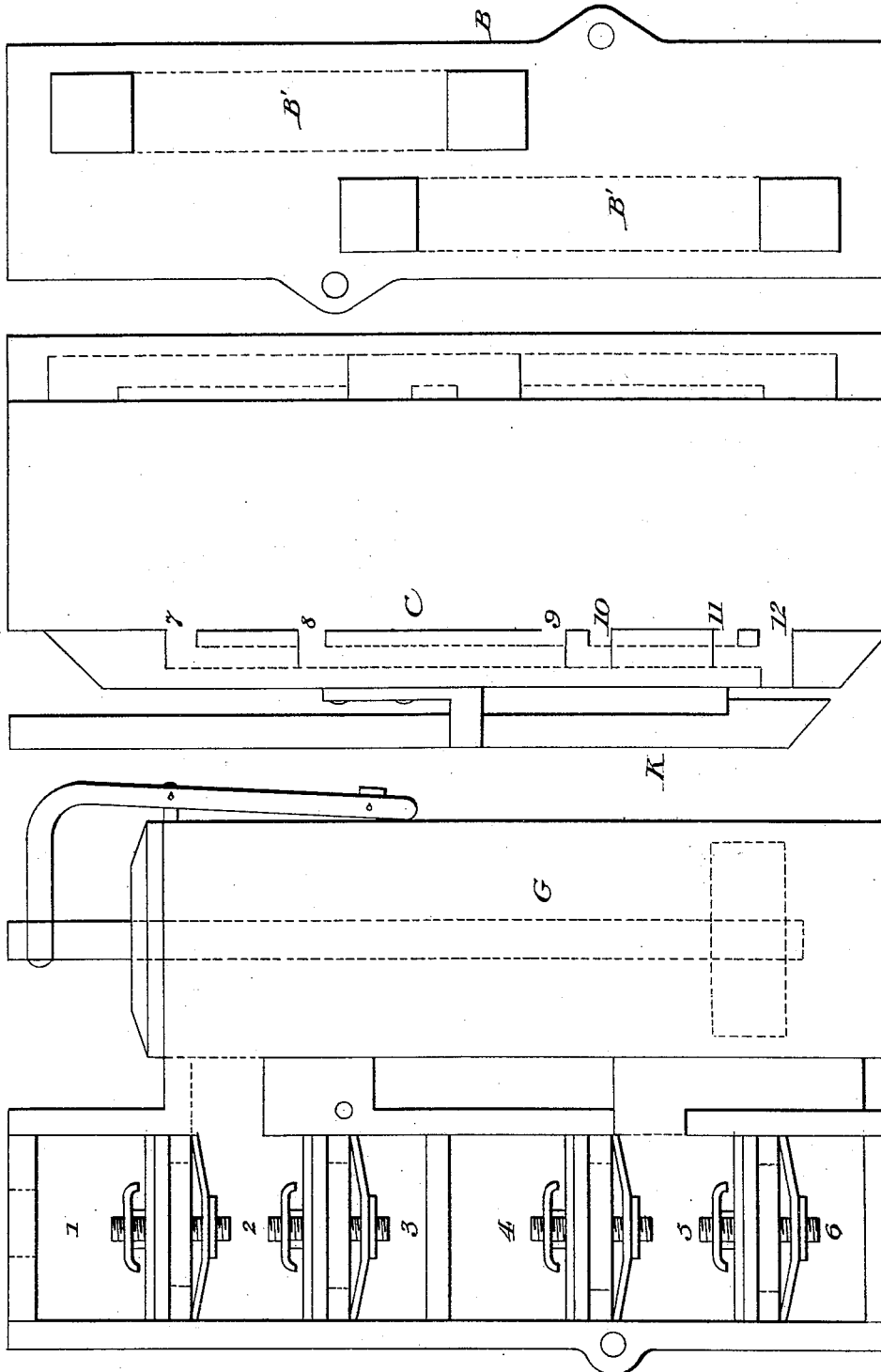
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original lost or mislaid.* *Handwritten signature*  
*Acting Chief Clerk.*

A. M. HANSEN.

PUMP.

No. 53,532.

Patented Mar. 27, 1866.



# UNITED STATES PATENT OFFICE.

A. M. HANSEN, OF STOCKTON, CALIFORNIA, ASSIGNOR TO WILLIAM HIGBY.

## IMPROVEMENT IN PUMP-VALVES.

Specification forming part of Letters Patent No. 53,532, dated March 27, 1866.

*To all whom it may concern:*

Be it known that I, A. M. HANSEN, of Stockton, in the county of San Joaquin and State of California, have invented a new and Improved Double-Acting Suction and Force Pump; and I do hereby declare the following to be a full, clear, and exact description of the nature, construction, and operation of the same, reference being had to the accompanying drawings, which are made part of this specification, and in which—

Figure I is a side elevation of a pump illustrating my invention, the side plate of the valve-chamber being removed to expose the interior arrangement of valves. Fig. II is a front elevation of the valve-chamber with its plates or removable sections attached. Figs. III and IV are detached views of the plates or covers of the valve-chamber. Figs. V and VI are detached views of a pump-valve made upon my improved plan.

Similar letters of reference indicate the same parts in all the figures.

My invention relates to the construction and arrangement of the valves and valve-chamber; and it consists, first, in a valve having a circular discharge-orifice in the seat and an annular valve to cover the same, arranged so as to cause the liquid to discharge both at the center and around the periphery of the annular valve, which increases the discharging capacity of the valve, and by diminishing the extent of its uprising motion prevents the noise and splash which occurs when the ordinary valve returns to its seat; second, in so constructing the valve-chamber that its interior may be made accessible by the removal of a single plate and all the various compartments of the valve-chamber opened and closed to the air by the opening or closing of a single aperture.

The following description will enable others skilled in the art to which my invention appertains to fully understand and use the same.

G represents the pump-cylinder, and I the pump-piston, which latter is provided with a suitable guide, M.

A represents the valve-chamber, which, with the exceptions hereinafter mentioned, may be cast in one piece with the cylinder G. The cylinder and valve-chamber stand alongside of each other in parallel positions, and the

openings which afford communication between the cylinder and valve-chamber lead into the compartments 2 and 5 of the latter. The valve-chamber at one end has an inlet-orifice, 14, and at the other end a discharge-orifice, 13.

Within the chamber A are six compartments, four of which contain valves, and which may be designated and described as follows: 1, a forcing-chamber; 2, a port-chamber; 3, a section-chamber; 4, a forcing-chamber; 5, a port-chamber; 6, a suction-chamber.

One side of the valve-chamber A is composed of a detachable plate, B, which is formed with two channels or grooves, B' B', which afford the requisite communication between the two force-chambers and the two suction-chambers. This plate is shown detached in Fig. 4, being secured to the valve-chamber by two screws only. It may be removed with facility without disturbing any other part of the valve-chamber, and permits ready access to the interior of the valve-chamber A when the valves require attention.

The opposite side of the valve-chamber has attached to it the plate C, in which are formed a series of channels or passages, 7 8 9 10 11 12. The first five communicate respectively with the valve-chambers 1, 2, 3, 4, and 5. The last, 12, extends within the end of plate C, at right angles to the others, and communicates with all the other channels, as well as with the lower valve-chamber, 6.

The channel 12 extends through the plate C—that is to say, when it is open it communicates with the external air and with the interior of the valve-chamber. It may be opened or closed by simply adjusting the valve K, which is attached to an arm pivoted to the chamber A. By thus opening the channel 12 air may be allowed to pass through the several channels 7, 8, 9, 10, 11, and 12 and into the valve-compartments 1, 2, 3, 4, 5, and 6, for the purpose of expelling the water therefrom to prevent freezing.

Each valve-seat D<sup>2</sup> rests upon one of the square partitions, D', which divide the valve-chamber A into its several apartments. The construction of the valve and valve-seat will be better understood by reference to Figs. 5 and 6. In the valve-seat D<sup>2</sup> is a circular opening, d, through which the liquid passes when the valve is raised. The valve D is simply a ring

or annulus, having an opening,  $d'$ , at the center. Now, it is manifest that by this arrangement the discharging capacity is increased either by as much as the area of the central opening,  $d'$ , or the difference between the areas of the annulus D and the square seat  $D^2$ , for, so far as my knowledge extends, this is the first pump-valve adapted to discharge both at the center and around its periphery. This valve in its operation is noiseless, as, having a greater discharging capacity, it need not rise to the extent of an ordinary valve, which discharges at the center or around the periphery alone.

F is a valve-stop of any suitable material, which, with the guide L, is attached to the upright bolt E, which is fastened to the cross-bar H on the under side of the partition D' and thus secured within the valve-chamber.

The operation of the pump may be briefly explained. When the piston I ascends the fluid passes first into chamber 6, thence through chamber 5 and into cylinder G. From G it passes through chambers 2 and 1 and is discharged through the exit-port 13. When the piston I descends fluid passes from chamber 6 through B' into chamber 3; thence it passes

through 2 into G, and from G through chambers 5 4, passage B' and 1, and out through opening 13.

Having thus described my invention, the following is what I claim as new and desire to secure by Letters Patent:

1. A pump-valve constructed in such a manner and so arranged relatively to its seat that the liquid shall be allowed to discharge both at the center and around the periphery of the valve, substantially as and for the purpose set forth.

2. The plate C, formed with the channels 7, 8, 9, 10, 11, and 12, adapted to communicate respectively with the chambers 1, 2, 3, 4, 5, and 6, and so arranged that all may be closed or opened to the external air by the adjustment of the valve K or an equivalent closing device.

3. In combination with the valve-chamber A, the detachable plate B, formed with the channels B' B', as and for the purpose specified.

A. M. HANSEN.

Witnesses:

C. D. SMITH,  
W. F. HALL.