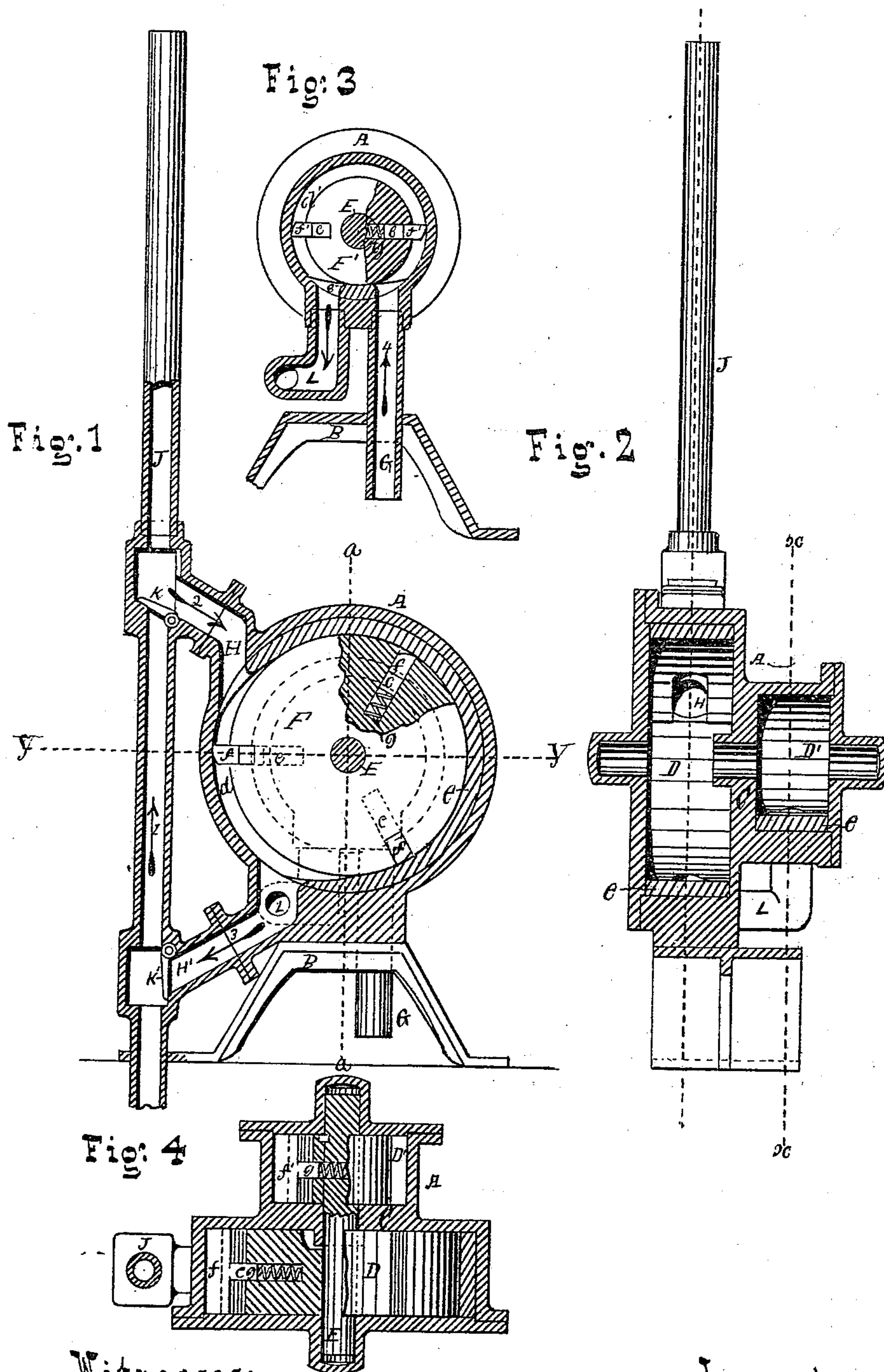


J. F. SMETHELLS.  
Bilge-Pump.

No. 165,623.

Patented July 13, 1875.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

JOHN F. SMETHELLS, OF CHICAGO, ILLINOIS.

## IMPROVEMENT IN BILGE-PUMPS.

Specification forming part of Letters Patent No. **165,623**, dated July 13, 1875; application filed March 15, 1875.

*To all whom it may concern:*

Be it known that I, JOHN F. SMETHELLS, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Bilge-Pumps; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 is a sectional side elevation of the machine embodying my said invention. Fig. 2 is a vertical central section of the same, showing those parts which are at the left hand of the line *a a* drawn through Fig. 1, with pistons removed. Fig. 3 is a vertical section, showing those parts which are at the right hand of the line *x x* drawn through Fig. 2, and Fig. 4 is a sectional plan taken on the line *y y* drawn across Fig. 1.

Similar letters of reference indicate like parts in the several figures of the drawing.

My invention has for its object to provide a pump for removing the bilge-water from a ship when at sea, and adapted to be operated by the pitching movement of the vessel. To that end it consists in the several parts, as will be more fully understood by the following description and claims.

In the drawing, A represents a cylindrical case, which is mounted on a suitable framework, B, permanently attached to the keelson of the vessel. This case is provided with a partition, C, forming two separate cylindrical chambers, D and D', the diameter of chamber D being greater than the diameter of chamber D', as shown in Figs. 2 and 4. E is a horizontal shaft, which is journaled centrally in the cylinder-heads and partition C, and so arranged as to freely revolve. Mounted on this shaft, within chambers D and D', are rotary piston-heads F and F', the diameter of which is slightly less than the diameter of their respective chambers, forming annular cavities or chambers *d d'*, as shown in Figs. 1 and 3. Permanently secured to the inner periphery of the case, within chamber *d'*, is a semi-annular ring, *e*, the lower end of which is chamfered to a feather-edge, the latter terminating at the wall of the case, as shown in Fig. 1.

Permanently secured to the inner periphery of the case, and within chamber *d'*, is an abutment, *e'*. (Shown in Fig. 3.) The periphery of each piston-head, F F', is provided with radial grooves *e*, within which is secured sliding pistons *f* and *f'*, adjusted to bear against the inner periphery of their respective cases. Each of the sliding pistons is provided with a spring, *g*, arranged between its inner edge and the base of the groove, by which means the piston is moved outward against the walls of the case.

The arrangement of these parts is such that when the piston-heads are made to revolve, bringing the outer edge of the sliding pistons against the inclined surface of ring *e* and abutment *e'*, the springs yield and allow the pistons to move inward, so as to pass the ring and abutment, and, when the former have passed the latter, the springs expand, instantly moving the pistons outward across chambers *d* and *d'*, and against the walls of the case.

Permanently attached to the lower surface of the case is a pipe, G, the cavity of which communicates with chamber *d'* at a point near the abutment, and extending downward to a point near the ship's keel. Attached to the case above and below its center, horizontally, are pipes H and H', the cavities of which communicate with chamber *d* at a point near the ends of ring *e*, as shown in Fig. 1. Permanently attached to the ends of these pipes, opposite to the case, is a vertical pipe, J, the cavity of which communicates with the cavities of pipes H and H'. The lower end of pipe J extends downward through the keel of the vessel, into the water, and its upper end extends upward through the deck of the vessel. K is a check-valve, which is seated in pipe J at a point slightly below the lower surface of the cavity in pipe H, and so adjusted as to be opened by the pressure of water against its lower surface, and to reseat as the pressure is released. K' is a like valve, which is seated within the lower end of pipe H', and so adjusted as to be opened by the pressure of water in the pipe, and to reseat by the over-balanced pressure of water in pipe J. Permanently attached to the case is a pipe, L, its cavity, at its upper end, communicating with chamber *d'* on the side of abutment *e'*, oppo-



site to pipe G, and at its lower end with the cavity of pipe H', slightly below chamber d, as shown in Figs. 1 and 3.

My invention is operated in the following manner: As the vessel descends the water is forced upward into pipe J, as indicated by arrow 1, and above valve K, and when the vessel ascends the water recedes, causing the valve to reseat, and the water above the valve passes from pipe J, through pipe H, as indicated by arrow 2, through chamber d, to and against the sliding pistons f of piston-head F, and exhausts through pipe H', into pipe J, as indicated by arrow 3, imparting a rotary motion to the respective piston-heads F and F', and by the rotation of the latter piston-head F' the water in the vessel is drawn upward through pipe G, into chamber d', as indicated by arrow 4, and forced therefrom, through pipe L, into pipe J, by the velocity of the sliding pistons f', and it passes off with the descending volume of water in the latter pipe below valve K.

Having thus described my invention, I claim—

1. In combination with the case A, provided

with partition C, the rotary piston-heads F and F', arranged on one and the same shaft, and provided with the sliding pistons f and f', as specified.

2. The pipes H and H', arranged to communicate one with the other through pipe J, and chamber d, in combination with the revolving piston-head F, as specified.

3. In combination with pipe J, passing through the keel of the vessel, and adapted to fill with water as the vessel descends, the valves K and K', arranged to cause the column of water in the pipe above valve K to descend through chamber d when the vessel ascends, as specified.

4. The discharge-pipe L, communicating with chamber d', and pipe H', whereby the water in said chamber is discharged into pipe J, as specified.

The above specification signed by me this 6th day of March, 1875.

JOHN F. SMETHELLS.

Witnesses:

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