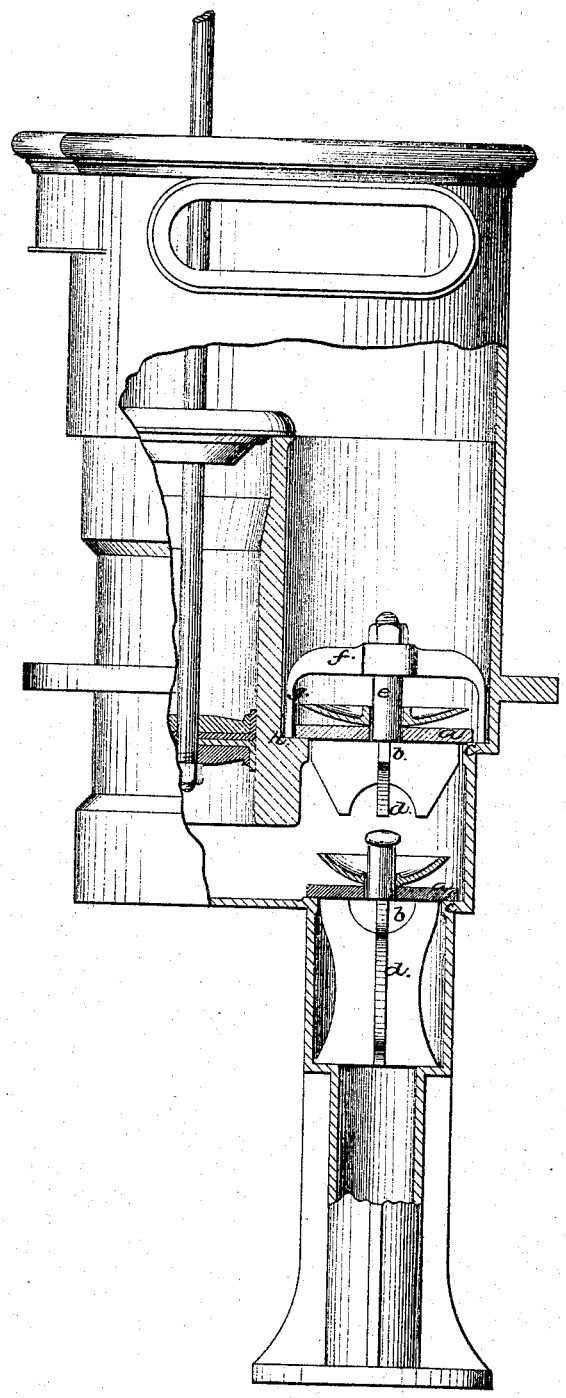
W. ADAIR.

PUMPS.

No. 182,737. Patented Oct. 3, 1876.



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UNITED STATES PATENT OFFICE.

WILLIAM ADAIR, OF LIVERPOOL, ENGLAND.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **182,737**, dated October 3, 1876; application filed March 14, 1876.

To all whom it may concern:

Be it known that I, WILLIAM ADAIR, of Liverpool, in the county of Lancaster, England, engineer, have invented new and useful Improvements in and connected with Pumps, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings.

This invention relates more especially to pumps for use on board ships; and consists, first, as means for obtaining a quick-closing valve of small weight and for increasing the durability of valves used in ships' pumps and in pumps for mines, or where grit or other substances is or are liable to pass the said valves with the liquid raised.

I employ a flexible disk-valve of india-rubber or leather and a perforated free feather-lift or like valve combined together as one. The said flexible disk-valve, when the pump is in action, opens and closes quickly, so as to serve to allow the liquid and grit, sand, or like substance to pass freely in an upward direction, but prevents return of the said liquid. The liquid, in rising, passes the said flexible disk-valve instead of flowing between the feather-lift valve and its seat, as heretofore. Hence all abrasion and wear of the said lift-valve and seat are avoided. If, however, any large or bulky object, such as is too large to pass the flexible disk-valve, is drawn up with the liquid, the said perforated feather-lift valve opens and allows free way to the said object.

The construction of the said compound valve is such that it is complete in itself, and can easily be removed, should the pump become choked below the said valve, or should its removal be desired from any other cause.

The accompanying sheet of drawings illustrates this part of my invention. This view shows a double-action ship's pump fitted with my improved valve, part of the sides of one of valve-chambers being removed for this purpose. The lower valve shows my improvement, in which the india-rubber-disk valve *a* works on the perforated seat *b* and seating *c*, and is guided in its lift by the feathers *d*.

Under ordinary working the valve *a* only operates, the valve *b* working only in case of emergency. The upper valve shows the same improvement in a skeleton-frame, in which the india-rubber disk *a* fits on its perforated seating *b* and seat *c*, and is guided in its lift by the spindle *e*, which works loosely in the guide *f*, preferably made with three prongs or legs, *g*, to rest on the recess or annular platform *h*.

It will be obvious that either of the above compound valves can be at once removed as a whole from its place.

I do not claim, broadly, the use of compound valves; but

I claim—

1. The compound pump-valve described, consisting of a flexible disk, *a*, perforated valve *b*, and feathers *d*, the disk *a* being capable of opening independently of as well as with the valve *b*, substantially as set forth.

2. The flexible disk *a* and perforated valve *b*, in combination with the frame *e f g* of the discharge-chamber of a pumping apparatus, substantially as set forth.

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Witnesses:
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