H. A. JAMIESON.

PUMP.

No. 192,072. Patented June 19, 1877.

Fig. 1.

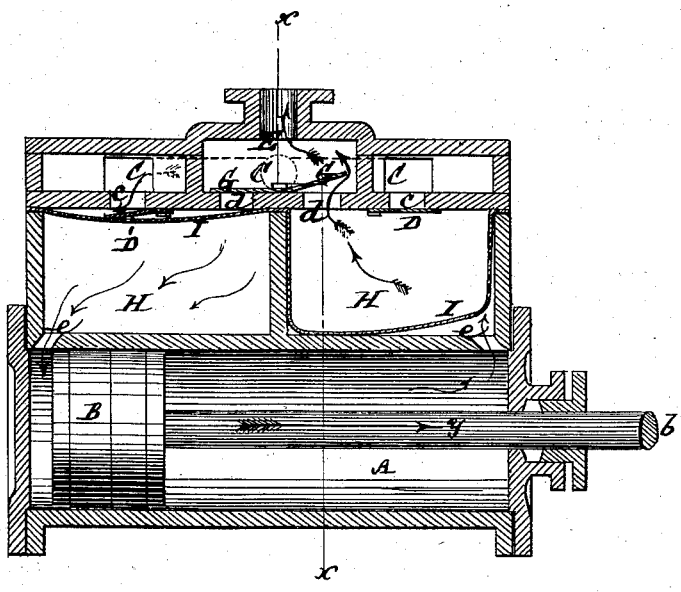
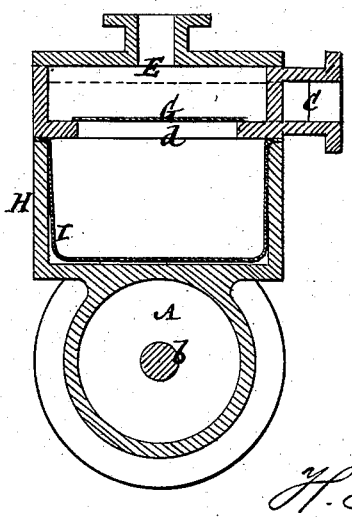


Fig. 2.



Witnesses
John Becker.
Jno. Wagner

Inventor.
H. A. Jamieson
by his Attorneys
Brown & Allen

UNITED STATES PATENT OFFICE.

HENRY A. JAMIESON, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **192,072**, dated June 19, 1877; application filed December 8, 1876.

To all whom it may concern:

Be it known that I, HENRY A. JAMIESON, of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Pumps; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, which forms part of this specification.

This invention, which is applicable to both single and double acting pumps, and to pumps employing either a piston or a plunger, is more especially designed for pumping gritty water, such, for instance, as found in mines and other places; and has for its object the avoidance of all contact of the gritty or impure water with the piston or plunger of the pump and its working-cylinder, whereby the cutting of the piston or plunger and its cylinder by the grit or impurities in the water is prevented, and consequently the efficiency and durability of the pump, as well as its relief from interior friction of the piston or plunger, are augmented.

The invention consists in a combination with the pump-cylinder, its piston or plunger, and the inlet and outlet valves of the pump of one or more chambers arranged between said valves and the pump-cylinder, and in free communication with said cylinder, and a flexible diaphragm applied to such chamber or chambers, whereby, on charging the pump-cylinder, and, in case of duplicate interposed chambers, one of said chambers, with any suitable liquid, such as oil or water free from gritty impurities, the motion of the piston or plunger is transmitted through the interposed liquid to the flexible diaphragm, and the latter alternately expanded and contrated within the interposed chamber or chambers, to first fill said chamber or chambers with the water being pumped, and subsequently to discharge the same therefrom.

In the accompanying drawing, the invention is shown applied to a horizontal double-acting piston-pump, such answering as well as any other pump to illustrate the novelty and utility of my invention.

Figure 1 is a longitudinal vertical section of such a pump, with the invention applied, and Fig. 2 a vertical transverse section thereof on the irregular line *x x*.

A is the pump-cylinder, and B its piston with attached rod *b*.

C is the inlet pipe or passage of the pump, formed with suitable branches or openings, including apertures *c c*, which are controlled by the inlet-valves D D.

E is the outlet or discharge passage of the pump, having apertures *d d*, which are controlled by the outlet or delivery valves G G.

Arranged between the pump-cylinder A and the inlet and outlet valves D G, are chambers H H, in free communication, respectively, by apertures *e e*, with opposite ends of the pump-cylinder. Each of these chambers should be of the same cubical capacity, or thereabout, as the pump-cylinder, less the space occupied by the piston and its rod therein. Said chambers may be of any suitable shape, and are fitted with a flexible diaphragm, I, applied in a close manner to their upper ends, beneath the inlet and outlet valves of the pump. Such flexible diaphragm may be either square, round, or of any other desired form, and may be made of india-rubber or any other suitable flexible material.

In the operation of the pump, supposing its piston B to be moving in direction of the arrow *y*, the oil, clean water, or liquid with which the pump-cylinder A and either one of the chambers H has been charged is drawn from the left-hand chamber H through its aperture *e* to the back of the piston B by the motion of the latter, and the liquid in front of the piston discharged through the right-hand aperture *e* to the right-hand chamber H. This action causes the left-hand flexible diaphragm I to be drawn down into the left-hand chamber H, as the diaphragm of the other chamber H had been previously drawn down into the latter, and thereby opens the left-hand inlet-valve D to admit the water being pumped to the top of the left-hand diaphragm I, while, or at the same time, the liquid in front of the piston B is forced up through the right-hand aperture *e*, and the depressed diaphragm I of the right-hand chamber H is accordingly raised, and made to expel the water, previously pumped or drawn into said chamber

through its inlet-valve D, out through the right-hand delivery-valve G. This action is repeated alternately for each chamber H, the flexible diaphragms and inlet and outlet valves of the same successively operating to keep up a continuous pumping, and the water which is pumped up and discharged always being prevented by the flexible diaphragms from entering the pumping-cylinder A.

In the case of a single piston, or of a plunger-pump, but one of the chambers H with its flexible diaphragm, inlet-valve, and outlet-valves, is necessary, and the working liquid interposed between said diaphragm and the pump-cylinder or its piston need only be sufficient to fill the pump-cylinder space unoccupied by the piston and its rod, or to fill the single chamber H of like capacity.

Of course different styles or constructions of pumps require different constructions or arrangements of the details of my invention.

I claim—

The combination, with the pump-cylinder, its piston or plunger, and the inlet and outlet valves of the pump, of one or more interposed chambers and flexible diaphragms, substantially as and for the purposes herein set forth.

HENRY A. JAMIESON.

Witnesses:
HENRY F. BROWN,
FRED. HAYNES.