No. 705,704. Patented July 29, 1902.

M. POTVLIET.

WATER SEALED AIR PUMP.

(Application filed Nov. 8, 1901.)

(No Model.)

Fig 1

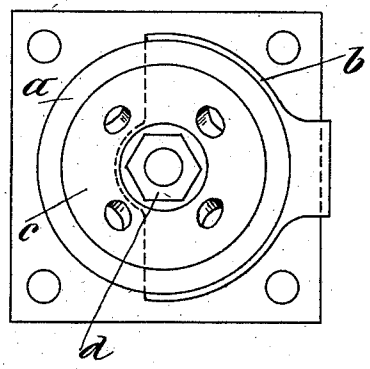


Fig. 2

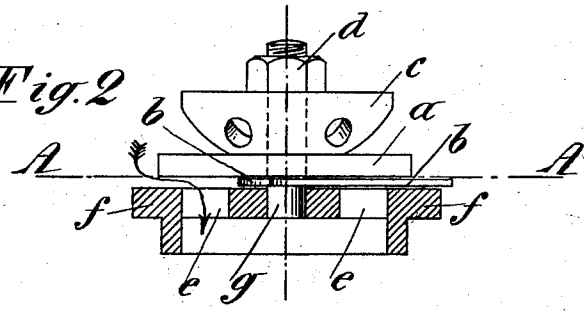


Fig. 3

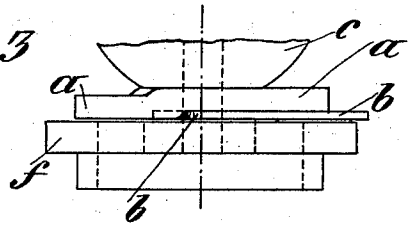
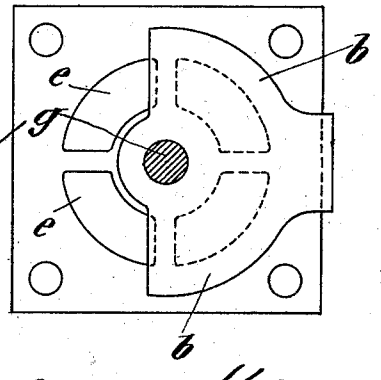


Fig. 4



Witnesses:

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

MICHIEL POTVLIET, OF AMSTERDAM, NETHERLANDS.

WATER-SEALED AIR-PUMP.

SPECIFICATION forming part of Letters Patent No. 705,704, dated July 29, 1902.

Application filed November 8, 1901. Serial No. 81,551. (No model.)

To all whom it may concern:

Be it known that I, MICHIEL POTVLIET, chemist, a subject of the Queen of the Netherlands, residing in the city of Amsterdam, Kingdom of the Netherlands, (with post-office address at 12 Puttkammerstrasse, Berlin, Germany, care of Wilhelm Giesel,) have invented a certain new and useful Improvement in Water-Sealed Air-Pumps, of which the following is a specification.

This invention relates to improvements in water-sealed air-pumps, and has for its object to attain by means of such pumps a constant vacuum of the highest degree possible, (ninety-four to ninety-five per cent.) This object is effected in the present invention by arranging a metal flap beneath the india-rubber or leather disks of flap-valves situated in the valve-casings, which reaches over a part of the grid or valve-opening and which as the valve is closing prevents the disk for a moment from immediately and completely closing, so that at each stroke of the piston a corresponding part of the water in the valve-casing can flow back into the air-cylinder to fill the clearance of the same, as much as is considered desirable to obtain a good and uniform working of the pump and maintain a high and constant vacuum.

The accompanying drawings illustrate a flap-valve for water-sealed air-pumps constructed according to this invention, Figure 1 being a plan; Fig. 2, a side elevation of the open valve, the upper part of the cylinder being in section; Fig. 3, a side elevation of the closed valve, and Fig. 4 a horizontal section at A A of Fig. 2.

The india-rubber or leather disk or flap *a* of the valve is prevented from lifting too high in the usual way by means of the guard *c*, *d* being the screw securing the same. Between the flap *a* and the top end *f* of the cylinder a metal flap *b* is inserted, the shape of which in the present example can be seen from Fig. 4. This metal flap, which may be rotated around the bolt *g*, covers a part of the valve-opening *e* and initially tends to prevent for a moment the india-rubber disk from seating itself down completely on its seating when the valve is on the point of closing; in this manner a small portion of the valve-opening area is left free where the valve does not immediately return to its seat, through which a portion of the water in the valve-casing can flow back into the air-cylinder (see arrow in Fig. 2) and fill its clearance, whereupon on increasing the suction of the pump the valve closes completely, Fig. 3. As the valve opens the metal flap *b* also rises, so that the valve-openings are left completely free and a clear passage is left. At the next stroke of the piston the valve action repeats itself, as has been described.

The metal flap *b* may be adjusted by turning it on the bolt *g* as a pivot, so that it will cut off different portions of the openings *e*, through which it is intended to let the water flow back, and consequently the amount of water required to fill up the clearance of the air-cylinder may be regulated.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. The combination with a valve for water-sealed air-pumps of a metal flap located against the face of the valve and covering a portion only of the same and adapted to momentarily hold a part of the valve away from its seat when the valve begins to close substantially as described.

2. A valve for water-sealed air-pumps consisting of a leather or rubber disk, a guard-plate, and a metal flap located against the face of the disk between the disk and valve-seating, and adapted to cover a portion of the valve-seating and to momentarily hold a part of the valve off the seat when the valve begins to close substantially as described.

3. A valve for water-sealed air-pumps consisting of a leather or rubber disk, a guard-plate, and an adjustable metal flap located against the face of the disk between the disk and valve-seating and adapted to cover different portions of the valve-seat and to momentarily hold a part of the valve off the seat when the valve begins to close, substantially as described.

In witness whereof I have hereunto signed my name, this 24th day of October, 1901, in the presence of two subscribing witnesses.

MICHIEL POTVLIET.

Witnesses:

WILHELM PAUL AUGUST KRUG,

AUGUST SIEGFRIED DOCEN.