No. 607,357. Patented July 12, 1898.

W. T. ELLISON.

PULSATING STEAM PUMP.

(Application filed Sept. 29, 1896.)

(No Model.)

Fig. 1.

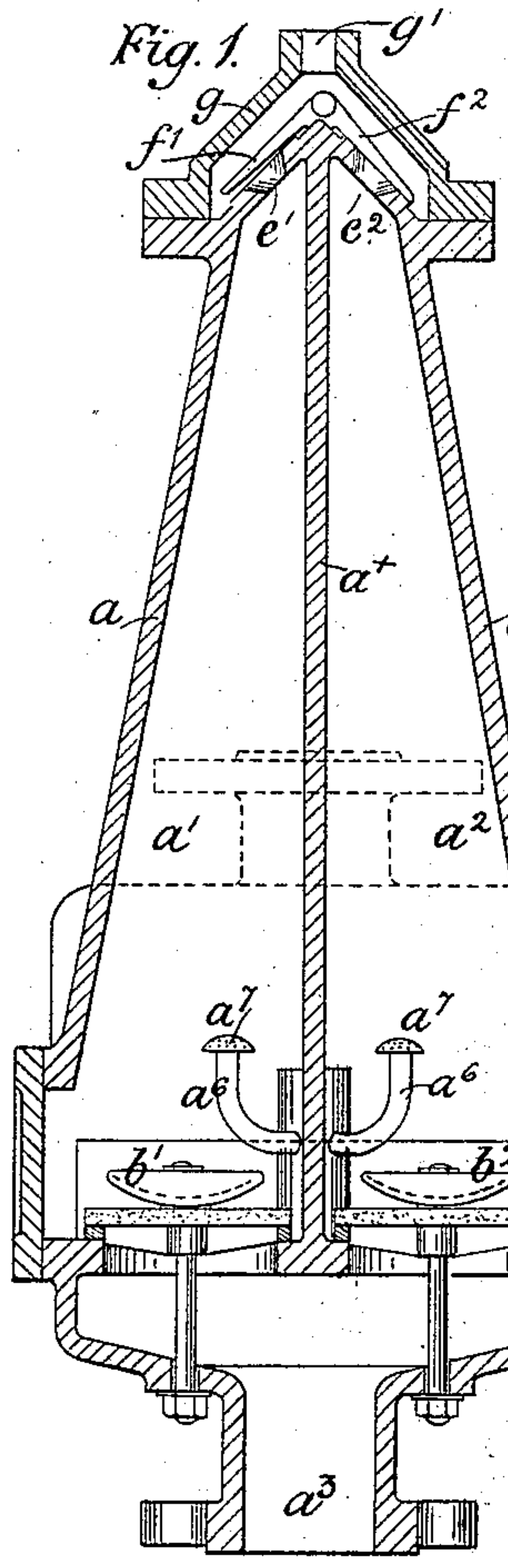


Fig. 1a.

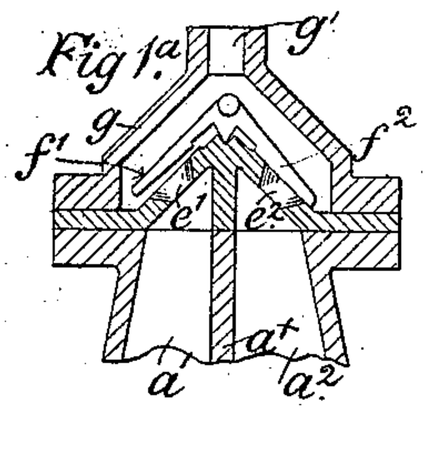


Fig. 2.

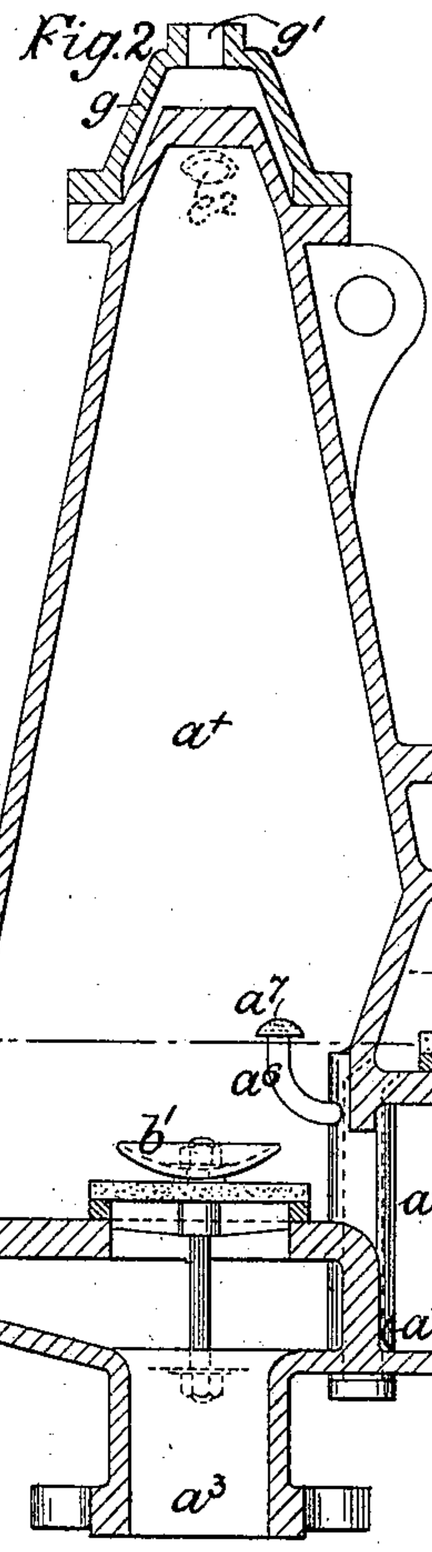


Fig. 3.

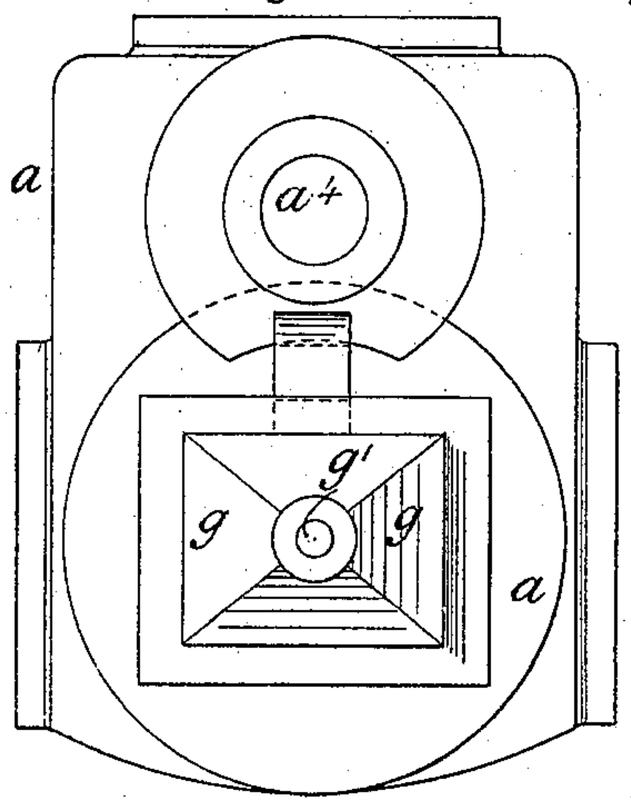
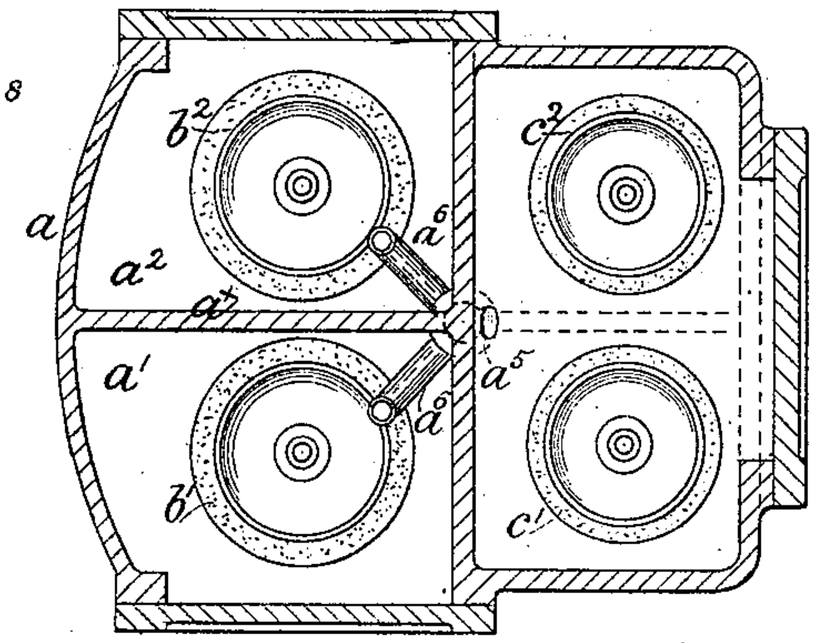


Fig. 2a.

Fig. 4.



Witnesses.
F. W. Wright.
A. C. Connor

Inventor.
William T. Ellison
By Howson & Howson
his Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM THOMAS ELLISON, OF IRLAM'S-O'TH-HEIGHT, ENGLAND.

PULSATING STEAM-PUMP.

SPECIFICATION forming part of Letters Patent No. 607,357, dated July 12, 1898.

Application filed September 29, 1896. Serial No. 607,327. (No model.) Patented in England July 3, 1895, No. 12,806.

To all whom it may concern:

Be it known that I, WILLIAM THOMAS ELLISON, a subject of the Queen of Great Britain, residing at Irlam's-o'th-Height, near Manchester, in the county of Lancaster, England, have invented new and useful Improvements in Pulsating Steam-Pumps, (for which British Patent No. 12,806, dated July 3, 1895, has been obtained,) of which the following is a specification.

My invention relates to the construction of pulsating steam-pumps for pumping all kinds of liquids, sewage, and the like, the object of my invention being to have a double-action pump in one cylindrical, conical, or other suitable vessel.

According to my said invention I form in a cylindrical, conical, or other suitable vessel a division-plate down its center, thus bisecting the circular or other section of the vessel into two parts of equal area (the said division-plate acting as a condenser, which, if required, can be provided with a few small holes in it) and terminating at the base, thus forming two valve-chambers, and I also connect the two steam-inlet apertures at the top by a ridge or cover at, say, an angle of ninety degrees to suit my purpose. By this means I can place a valve resting on the apex of the ridge formed by the aforesaid angle, the said valve thus being sensitive, as it has its center of gravity below the point of suspension. I also prefer to place or arrange the suction and delivery valves so that they shall both be horizontal.

In order that my invention may be clearly understood, I have annexed hereto a sheet of drawings, and have marked the same with letters of reference corresponding with those in the following description.

Figures 1 and 2 are front and side elevations in section through about the center of the pump made according to my invention. Fig. 3 is a plan view thereof, and Fig. 4 is a horizontal section taken through about the lines A B on Fig. 2. Figs. 1^a and 2^a illustrate modifications hereinafter particularly referred to.

a is the vessel or body of the pump, divided by the plate or partition a^+ into the two valve-chambers a' a^2. The plate or partition a^+ being a wall common to both chambers a' and a^2 of the greatest possible area (being at the center or broadest part of the vessel a) forms a very perfect condenser to create the vacuum necessary to raise the water into one of the chambers, (say a',) which is filled with steam, while the other chamber (say a^2) is filled with water or liquid fresh from the well or source of supply. The division-plate a^+ may be corrugated sheet metal or may be provided with radiating ribs or otherwise formed with increased condensing-surface.

b' b^2 are the suction-valves admitting the liquid from the inlet a^3 to the valve-chambers a' a^2, respectively, and c' c^2 are the respective delivery-valves of the said chambers a' a^2, leading to the outlet a^4, and since, as before stated, I prefer to arrange the valves b' b^2 c' c^2 horizontally it is evidently necessary that the vessel a must be enlarged at the lower end, as seen on the drawings, to allow of such construction.

Figs. 1, 2, and 3 show the vessel a conical; but it may be cylindrical or of other suitable form, providing that the plate or partition a^+ divides it into two chambers of equal size and extends from top to bottom of the said chambers.

I may make a few holes in the division-plate a^+ to assist the formation of the vacuum, and these holes should be below the level of the delivery-valves c' c^2. I prefer, however, to make or form a short passage a^5 in the center of the vessel a and to form in this passage holes at or near the top and bottom thereof, communicating with the chambers a' a^2. (See also sectional detached view, Fig. 2^a.) By this means when the liquid is being forced down out of one chamber (say a') part will enter the short passage a^5 through the lower hole a^8 and will be injected through one of the upper holes into the second chamber (say a^2.) Each of the upper holes leading from this passage into the chambers a' a^2 is or may be provided with a short pipe a^6, which may be, if preferred, made or fitted with a rose a^7. (See Figs. 1 and 2.) This injection of liquid from one chamber to another assists the formation of the necessary vacuum and renders my pump very easy to start. The top of the passage a^5 is open to the space above the delivery-valves c' c^2, so that the passage a^5 can also

be supplied from this space when required by the conditions under which the pump is working.

The steam-inlet apertures e' e^2 of the two chambers a' a^2, respectively, are in the top of the vessel, which is so formed that the apertures are at an angle of, say, ninety degrees to each other, the top of the vessel thus forming a ridge, on the apex of which the valve f' f^2 is suspended either as seen at Fig. 1 or at Fig. 1^a. The said valve f' f^2 opens or closes the apertures e' e^2 alternately, as usual in pulsating steam-pumps, and being suspended, as described and shown, the valve f' f^2 is most sensitive and quick in action, as its point of suspension is above its center of gravity and not below it, as is usual in angular or other valves for this purpose.

The valve f' f^2 is inclosed, as usual, by a cover g, to which the usual steam-admission pipe may be connected at g'. If preferred, the top of the vessel a may be made separate therefrom, as seen at Fig. 1^a, and connected thereto by bolts or otherwise.

I claim as my invention—

1. A pulsating steam-pump in the form of a single vessel provided with a vertical partition across its broadest part acting as a condenser and dividing the vessel into two compartments, the said vessel being provided with a passage a^5 having openings a^8 communicating with each compartment of the vessel, and pipes a^6 leading from the said passage into the compartments, substantially as and for the purpose set forth.

2. A pulsating steam-pump in the form of a single vessel of suitable shape, provided with a vertical division-plate or partition extending from side to side thereof at the broadest part of the vessel and having valve-seats at the top thereof arranged at an angle of about ninety degrees to each other, thus forming a ridge, and a valve suspended on said ridge with its point of suspension above its center of gravity, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM THOMAS ELLISON.

Witnesses:
JNO. HUGHES,
J. E. HUGHES.