

(No Model.)

J. P. HYDE.

Automatic Flushing Cistern for Water Closets.

No. 237,187.

Patented Feb. 1, 1881.

Fig. 1.

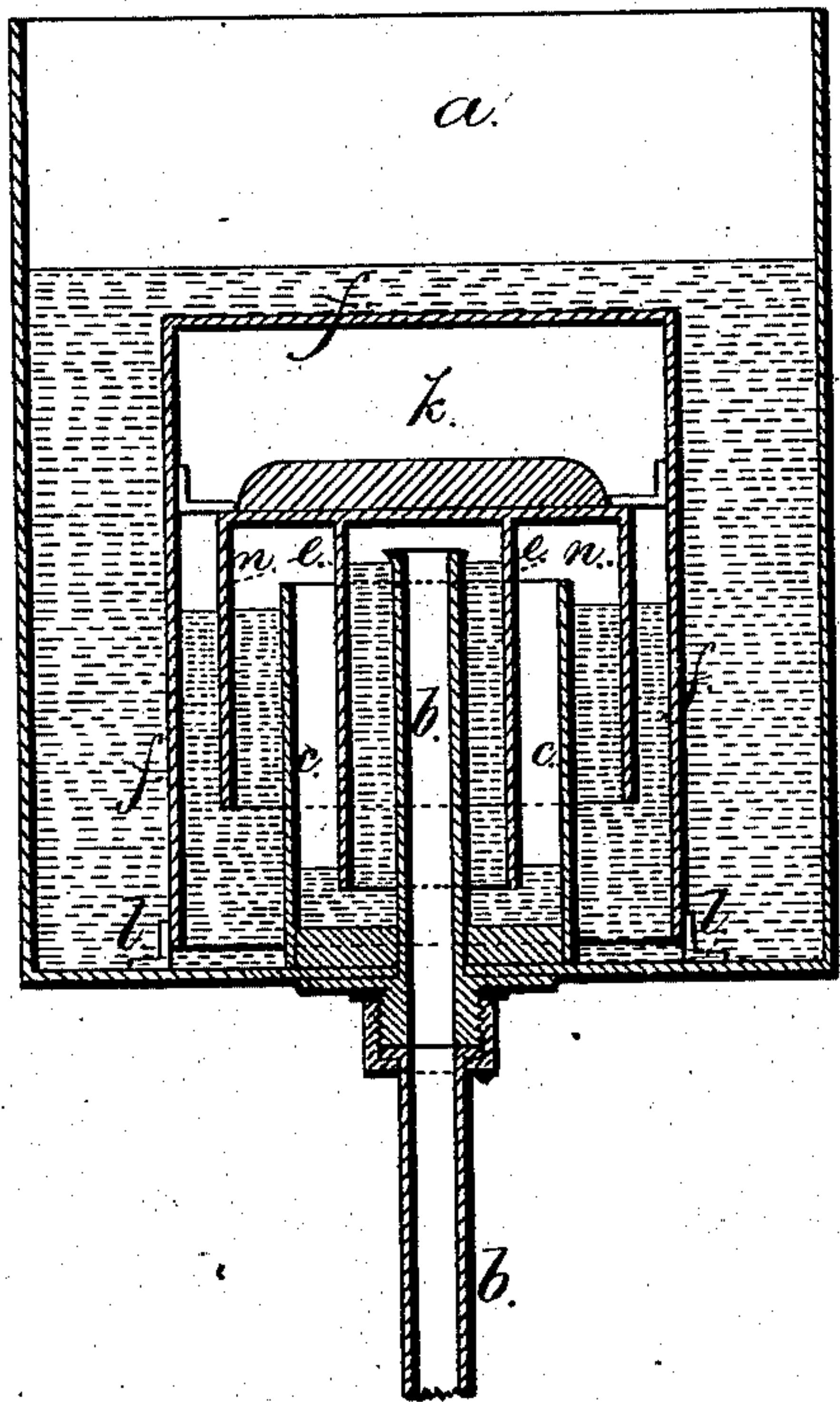


Fig. 2.

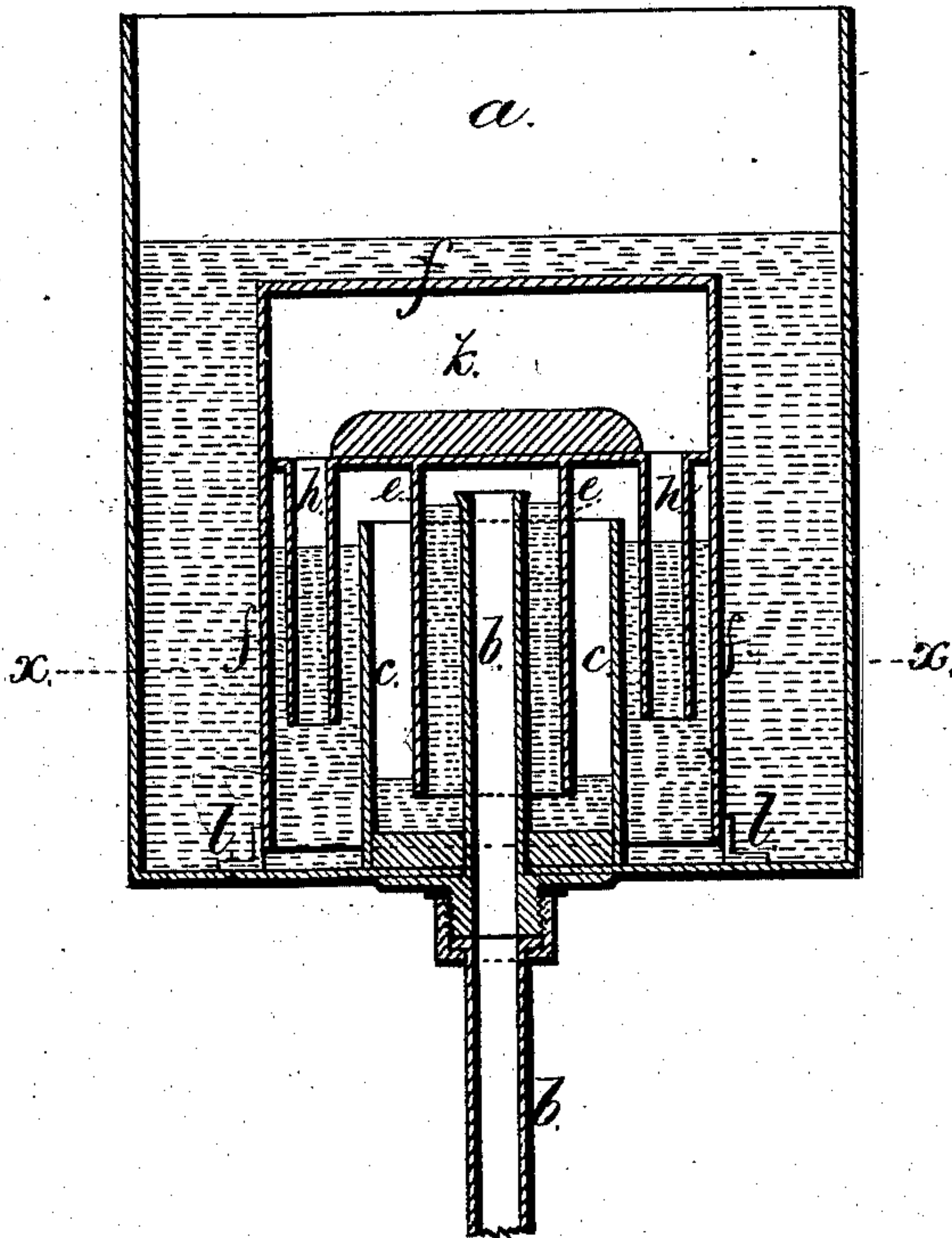
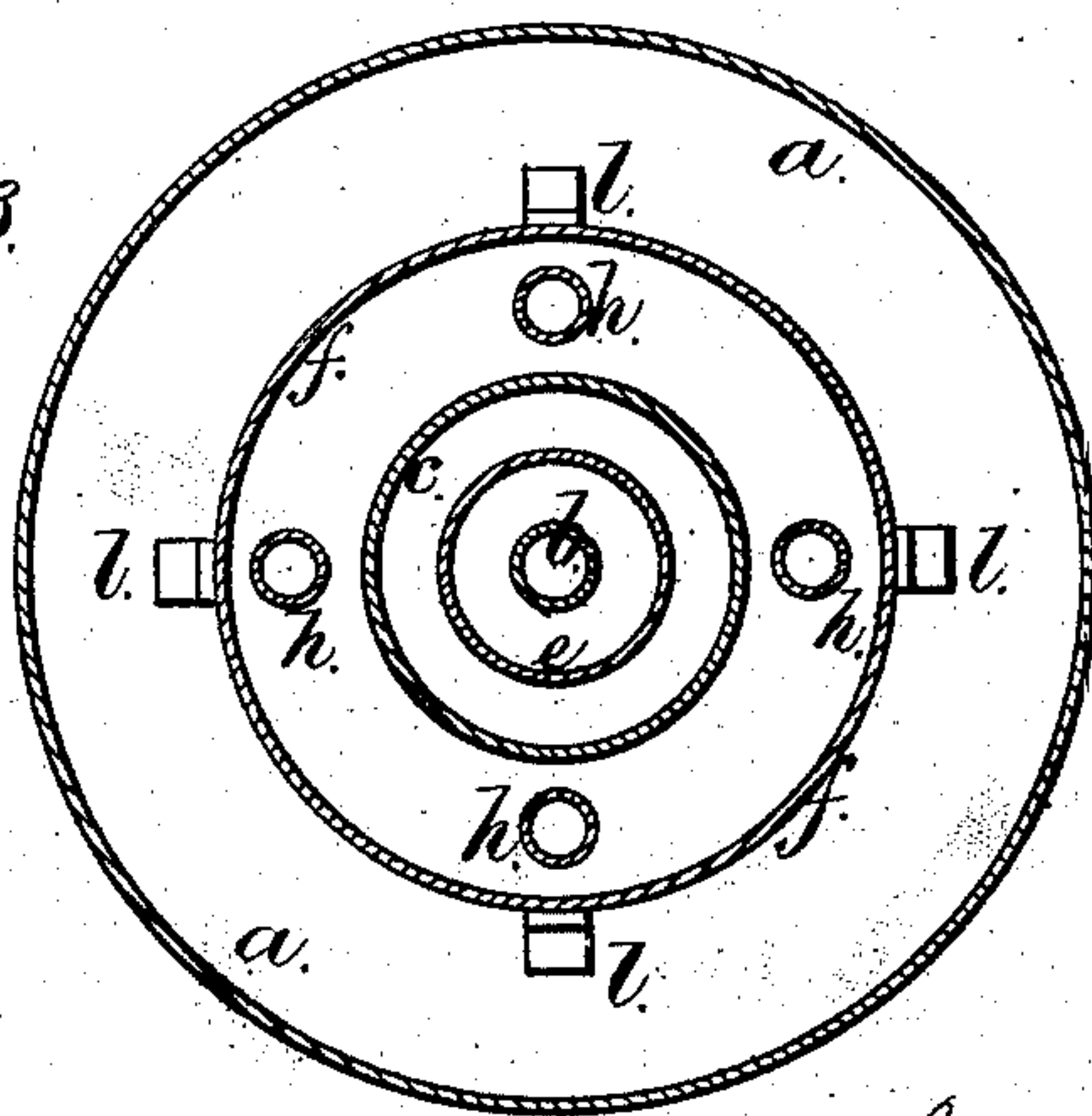


Fig. 3.



Witnesses:  
Harold Serrell  
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Inventor:  
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per Lemuel W. Serrell  
att.



# UNITED STATES PATENT OFFICE.

JAMES P. HYDE, OF NEW YORK, N. Y.

## AUTOMATIC FLUSHING-CISTERN FOR WATER-CLOSETS.

SPECIFICATION forming part of Letters Patent No. 237,187, dated February 1, 1881.

Application filed April 5, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES P. HYDE, of the city and State of New York, have invented an Improvement in Automatic Flushing-Cisterns for Water-Closets, Urinals, &c., of which the following is a specification.

Cisterns have been made into which the water is allowed to run gradually, and in such cisterns a siphon has been introduced, the object being to draw off the water suddenly; but difficulty has arisen in filling the siphon, and unless the same is full the water will run gradually through the same and not flush the closet. In some instances a siphon has been made with a second bend to confine a column of water; but the same is not compact and adapted to be received into the cistern itself.

My invention relates to a compound siphon, in which there is a column of water confined between the parts of the siphon and air intervenes between such column and the column of water that is allowed to accumulate gradually within the cistern.

The special feature of my improvement consists in the combination, with said compound siphon, of an air-chamber within the cap of the siphon, and tubes from the same into the water-space between the cap and the first cylinder of the siphon. By this device the air will be compressed within the chamber of the cap as the column of water in the cistern increases, and when the siphon commences to draw the water off the air will expand and force down the water into the siphon and increase the volume thereof to insure the rapid filling of the entire siphon with water.

In the siphons that have heretofore been made with a cap over the exit-tube the air may accumulate and interfere with the action of the siphon. In my siphon the air-chamber in the cap is separated from the water-space, so that air cannot escape from the same into the siphon.

In the drawings, Figure 1 is a vertical section of the cistern and siphon. Fig. 2 is a similar view in a slightly-modified form, and Fig. 3 is a section at the line *xx* of Fig. 2.

The cistern *a* is of a suitable size and shape. It is shown as circular. The pipe *b* leads to the closet or urinal, and it rises within the cistern *a*; and there is around it a stationary tube,

*c*, the space between *b* and *c* being sufficient to allow for the introduction of the pendent tube *e*, the upper end of which is connected to the weighted cap *f*, that is supported on legs *l* or otherwise within the cistern. It is preferable to have this cap removable and sufficiently weighted not to be moved by the action of the water. A suitable water-pipe and cock are used to supply water to the cistern, and the water is allowed to run freely into the cistern to fill the parts and cause the siphon to operate. Then the cock is closed and only a small stream passes in, which is regulated in size according to the period of time which it is desired shall elapse in filling the cistern and the consequent frequency of the flushing operation. Water will remain between the tubes *b* and *c* similar to the water in a sewer-trap, and the cap *f* will have air in the upper part, the same having been drawn in below its lower edge when the water was siphoned out of the cistern. Hence as the water accumulates in the cistern it rises and compresses the air in the cap *f*, and the water rises between *b* and *c* in proportion to the pressure, and the air may bubble through the auxiliary column of water between *b* and *c*, and the difference of level of the auxiliary column (between *b* and *c* and *c* and *e*) will be the same as the difference of level inside and outside the cap *f*.

In Figs. 1 and 2 the siphons are shown as nearly ready to fill and flow. As soon as the pressure of the water in the cistern is sufficient to break away the auxiliary column of water and allow the air that is confined in the siphon-trap to escape down the tube *b*, the external water of the cistern rushes in and fills the siphon, so as to cause it to continue to run until the atmosphere is drawn in below the lower edge of the cap *f*. The air that is confined in the cap *f* performs an important duty in starting the siphon, because as soon as the auxiliary column of water gives way and the pressure on the confined air is relieved, such air expands and gives a momentum to the water as it passes into the space between *c* and *b*. I make use of the cylinder *n* to confine the air in the upper part of the cap, and in the space between such cylinder *n* and the cap *f*, or else use pendent tubes *h*, that are open at the upper end into the air-space *k* in the cap, and

they are also open at the bottom end. The column of water compresses the air in the cap and the water rises within the tubes *h*; but as soon as the pressure is relieved the air expands and the water is moved forcibly toward the siphon to cause it to fill the same and flow until the air draws in beneath the edges of the cap *f*, as aforesaid.

I am aware that water-closet traps have been made in which a double cylinder has been raised and lowered by the pull of the closet, and this acted, in connection with a double cylinder around the waste-pipe, to sustain a column of water in the water-closet, the confined air acting between the respective cylinders. This apparatus did not act as a siphon, because the central tube to the sewer could not become filled, the passage-ways being too small, and there was not any air chamber or tubes within the cap.

I claim as my invention—

The combination, in an automatic flushing-cistern to which water is supplied gradually, of the pipe *b*, leading to the closet or other article to be flushed, the fixed cylinder *c*, surrounding said pipe *b*, the pendent cylinder *e*, the cap *f*, surrounding the cylinder *c*, and having an air-chamber therein, the tubes *n* or *h*, that open at their upper end into the otherwise confined air-space within the cap *f*, and the supports *l* for the cap *f*, substantially as and for the purposes set forth.

Signed by me this 29th day of March, A. D. 1880.

JAMES P. HYDE.

Witnesses:

WILLIAM G. MOTT,  
HAROLD SERRELL.