

(No Model.)

H. L. HOWE.

AUTOMATIC FLUSHING TANK.

No. 384,978.

Patented June 26, 1888.

FIG. I.

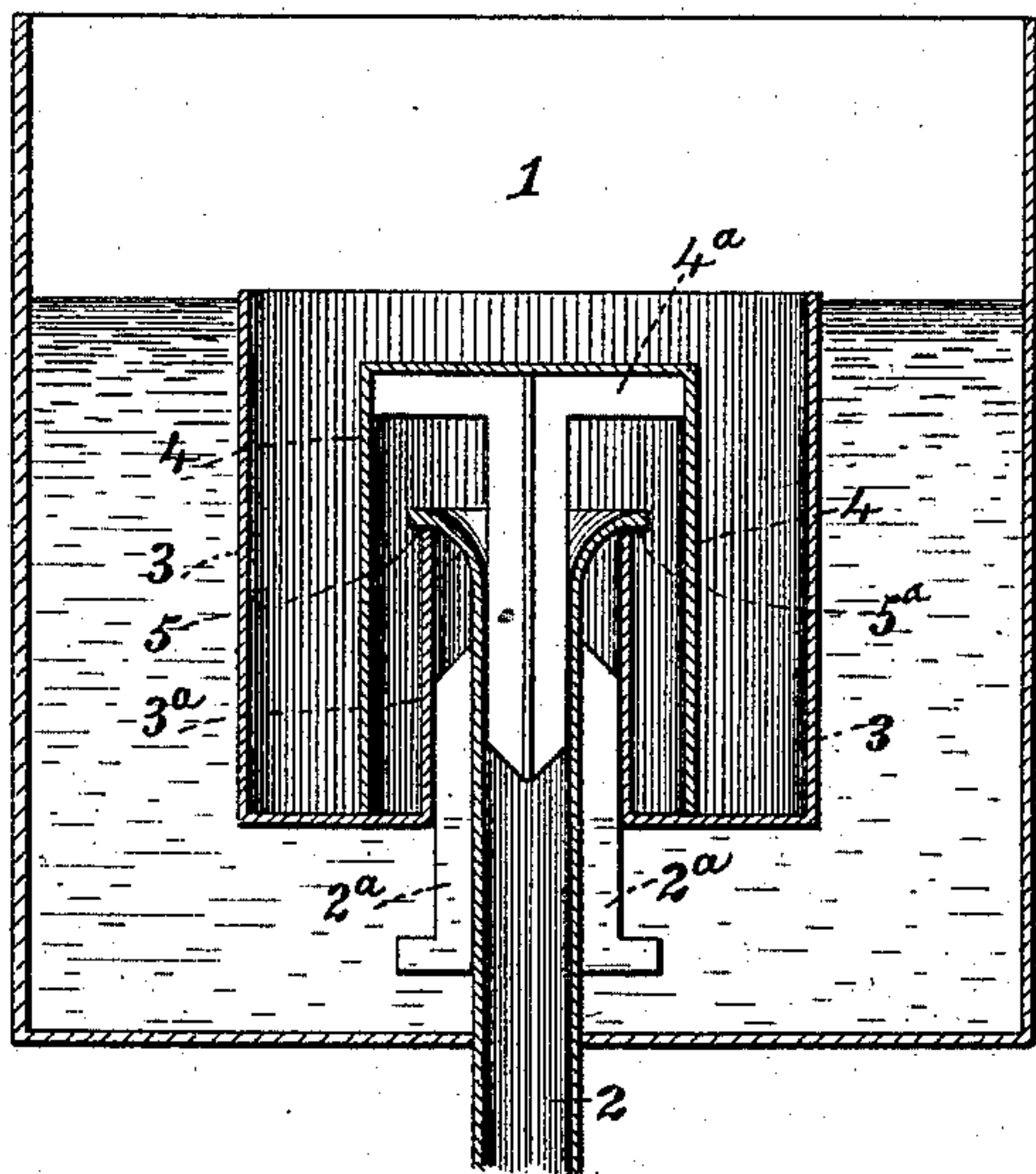


FIG. II.

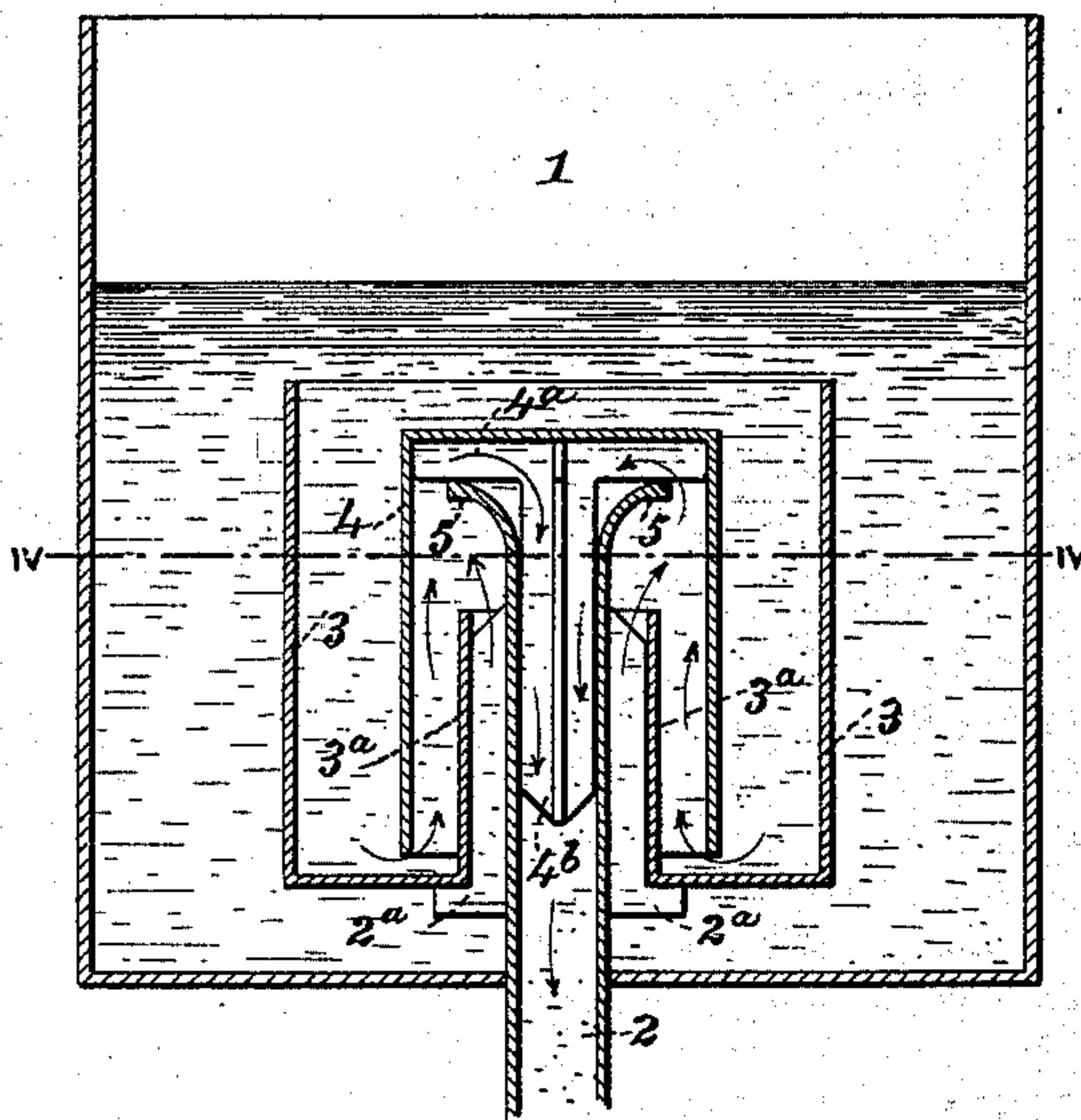


FIG. III.

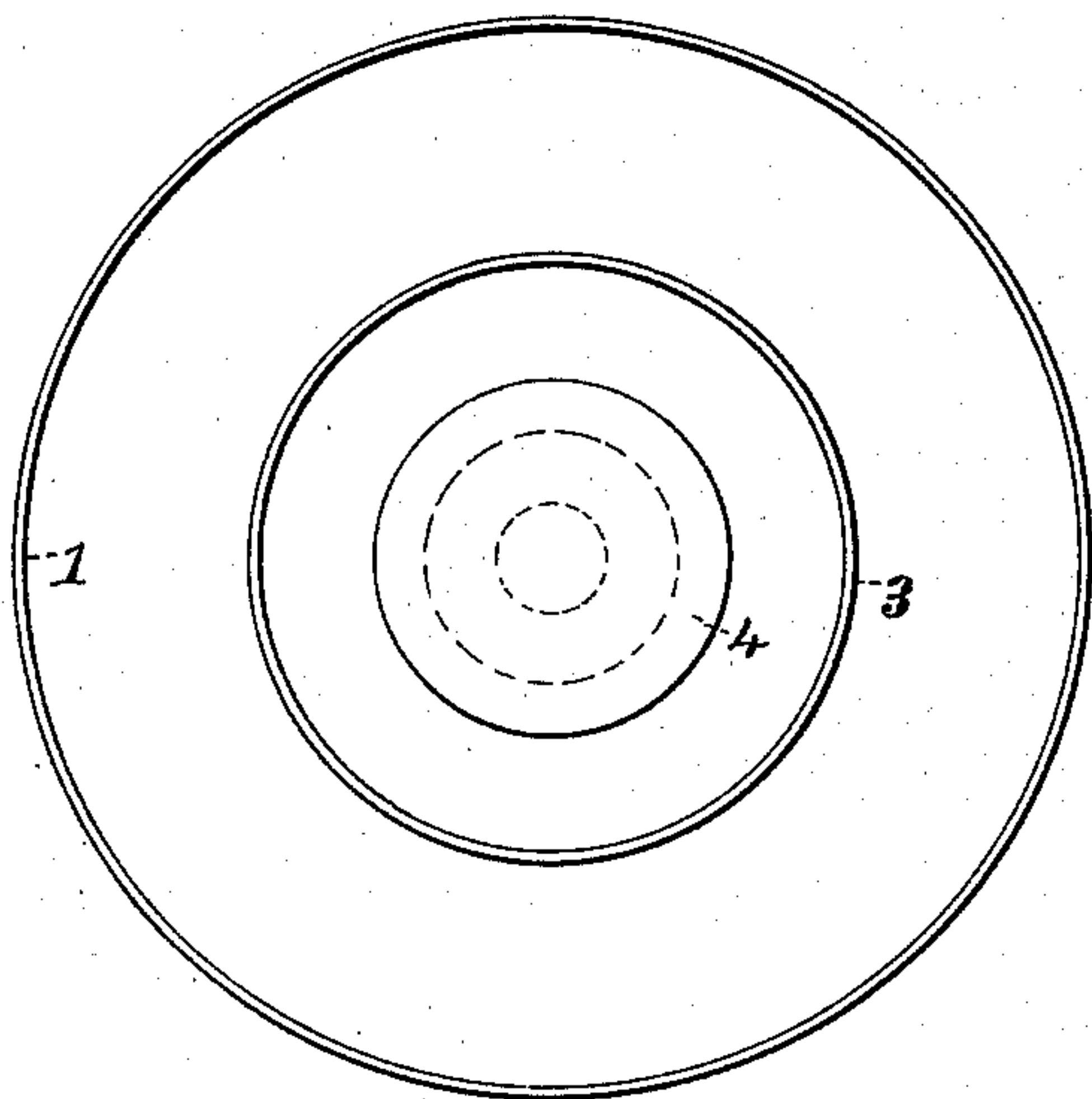
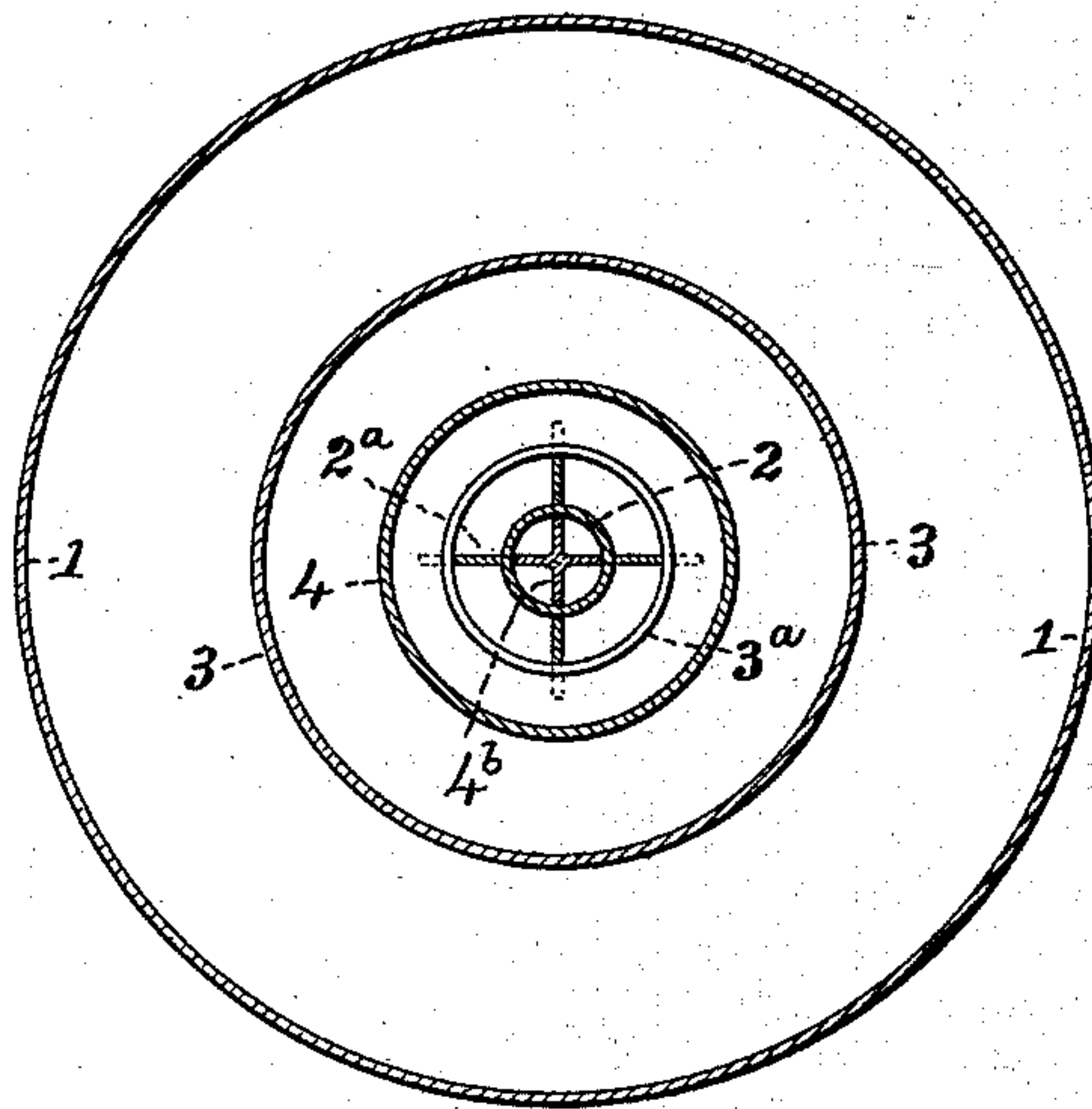


FIG. IV.



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# UNITED STATES PATENT OFFICE.

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## AUTOMATIC FLUSHING-TANK.

SPECIFICATION forming part of Letters Patent No. 384,978, dated June 26, 1888.

Application filed May 25, 1887. Serial No. 239,340. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY L. HOWE, a citizen of the United States, residing at Canandaigua, in the county of Ontario and State of New York, have invented certain new and useful Improvements in Automatic Flushing-Tanks, of which the following is a full, clear, and exact description.

My invention relates to that class of apparatus which is adapted to keep a considerable body of water in a tank, in readiness to be discharged when required with such rapidity as to cause an effective flushing and cleansing of discharge pipes and traps, and particularly to apparatus in which this discharge is effected automatically by means of a siphon, which is brought into action by a sudden accretion of the flow into the storage-tank.

My improved apparatus for effecting these results is constructed with a discharge-pipe rising within the tank, surrounded by an annular floating bucket and an inverted bucket within this, the whole constituting a siphon and so constructed that the filling of the tank while the annular bucket is empty causes the latter to float, and in so doing to close as a valve around the mouth of the discharge-pipe and prevent the flow; but when water overflows into the floating annular bucket, permitting it to sink within the tank, the discharge-pipe will be opened, the siphon action set up, and the tank quickly emptied.

In order that my invention may be fully understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure I is a vertical section showing the tank in normal position with the automatic discharge devices at rest. Fig. II is a vertical section showing the tank in the act of discharge. Fig. III is a plan view. Fig. IV is a horizontal section on the line 4 4, Fig. II.

1 represents a tank of any suitable dimensions, which is supplied with water in any customary manner. From the bottom of this tank rises a stationary discharge-pipe, 2, having a funnel-shaped mouth at top, the lower surface of which forms a valve-seat, 5<sup>a</sup>, as hereinafter described. An annular floating bucket, 3, surrounds the vertical discharge-pipe 2, and is adapted to move up and down in guides 2<sup>a</sup>,

fixed to the exterior of the vertical discharge-pipe 2. The central tube, 3<sup>a</sup>, of the annular bucket fits beneath the flaring funnel-shaped top of the discharge-pipe 2, so that when the annular bucket 3 floats, as shown in Fig. I, the margin of said vertical tube 3<sup>a</sup> forms a valve, 5, being seated on the under surface of said funnel-shaped top of the discharge-pipe. An inverted cup or bucket, 4, surrounds the pipe 2 and the vertical tube 3<sup>a</sup> of the floating bucket 3 and rests on the bottom of said bucket 3, excepting when the latter is in its lowermost position, as shown in Fig. II, at which time the inverted cup or bucket 4 is supported by internal ribs or plates, 4<sup>a</sup>, within the top of the inverted bucket 4, so as to permit the free passage of water over the top of the discharge-pipe 2, as illustrated in Fig. II. The parts are so proportioned that when they are in this position a contracted space or passage exists between the bottom of the floating bucket 3 and the lower margin of the inverted bucket 4; but when the floating bucket 3 rises this space is closed before the closing of the valve 5, formed by the top of the vertical tube 3<sup>a</sup>.

In carrying out the invention it is not necessary that the top of the tube 3<sup>a</sup> shall close water-tight against the surface 5. The annular floating bucket 3 3<sup>a</sup> and inverted bucket 4 may be so combined with the discharge-pipe 2 as to constitute an effective siphon without the use of a valve. The inverted bucket 4 is guided in a vertical line by a grooved rod or strips of metal, 4<sup>b</sup>, adapted to permit the passage of water.

The tank 1 may be made of any size and of round, square, oblong, or any preferred shape, and so may also the buckets 3 and 4.

Operation: Water is let into the tank 1, causing the annular bucket 3 to float and close the valve 5, as illustrated in Fig. I. When the water overflows into and fills the bucket 3, it sinks to the position shown in Fig. II, opening the valve 5 and permitting the water to rush freely into the discharge-pipe 2. This becoming filled, acts as a siphon, empties the flushing-tank 1 and annular bucket 3 until the depletion of the latter causes it to rise to the position shown in Fig. I and close the valve 5. If the flow of water from the bucket 3 is too great, said bucket floats, closing the space be-



tween it and the lower margin of the inverted bucket 4, and so remains until the water outside is low enough to permit the annular bucket 3 to fall. The flow of water is therefore automatically governed, so that the amount discharged is regulated and controlled by the adjustment of these two buckets. The guiding-strips 2<sup>a</sup> and the stop-strips 4<sup>a</sup> so divide the stream as to make the action and flow steady and prevent any eddying tendency or vertical motion within the top of the inverted bucket 4. The tank 1 may be filled from any usual source of supply and the water maintained at a certain height by a ball-cock or by a slight overflow from the tank 1 independent of the valve 5, or such overflow may be dispensed with.

Flushing at will may be effected by filling the bucket whenever required to produce the siphon action by a sudden accretion of the water-supply, caused by opening the faucet by a pull-wire or hinged seat connections, or in any usual way; or the same result may be accomplished by suddenly submerging the floating bucket by a lever or other device.

If preferred, the apparatus may be allowed to keep up an automatic and regular intermittent action, the water gradually rising in the tank and floating the bucket to its highest position, then overflowing and sinking it when the contents of the tank and bucket are suddenly discharged by siphon action until the siphon is broken by entrance of air beneath the bucket 3, after which the water-supply again gradually fills the tank and floats the bucket, as before.

Having thus described my invention, the following is what I desire to secure by Letters Patent:

1. The automatic intermittent siphon constituted of the discharge-pipe 2, extending upward within the tank, the annular floating bucket 3, surrounding the discharge-pipe 2, and the inverted bucket 4, covering the top of said discharge-pipe, substantially as and for the purposes set forth.

2. The combination of the tank 1, the vertical discharge-pipe 2, provided with a valve-seat, 5<sup>a</sup>, the annular floating bucket 3, provided with a central tube, 3<sup>a</sup>, constituting a valve, and suitable guides, 2<sup>a</sup>, for the vertical movement of the said floating bucket, as explained.

3. The combination of the vertical discharge-pipe 2, the annular floating bucket 3, having limited vertical movement relatively to said discharge-pipe, and the inverted bucket 4, resting on the bottom of the bucket 3 when the latter is elevated and supported, so as to leave space between the lower margin of the inverted bucket and the bottom of the floating bucket when the latter is lowered, thus serving to regulate the escape of water from said floating bucket, as explained.

4. The combination, with the vertical discharge-pipe 2, floating bucket 3, and inverted bucket 4, of the guides 2<sup>a</sup> and 4<sup>a</sup>, constituting stops to limit the descent of the floating bucket 3 and inverted bucket 4, as and for the purposes set forth.

5. The combination, with the vertical discharge-pipe 2, floating bucket 3, and inverted bucket 4, of the guides and stops 2<sup>a</sup> and 4<sup>a</sup>, formed of ribs or plates to prevent eddying or vertical movement in the discharged water.

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Witnesses:

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