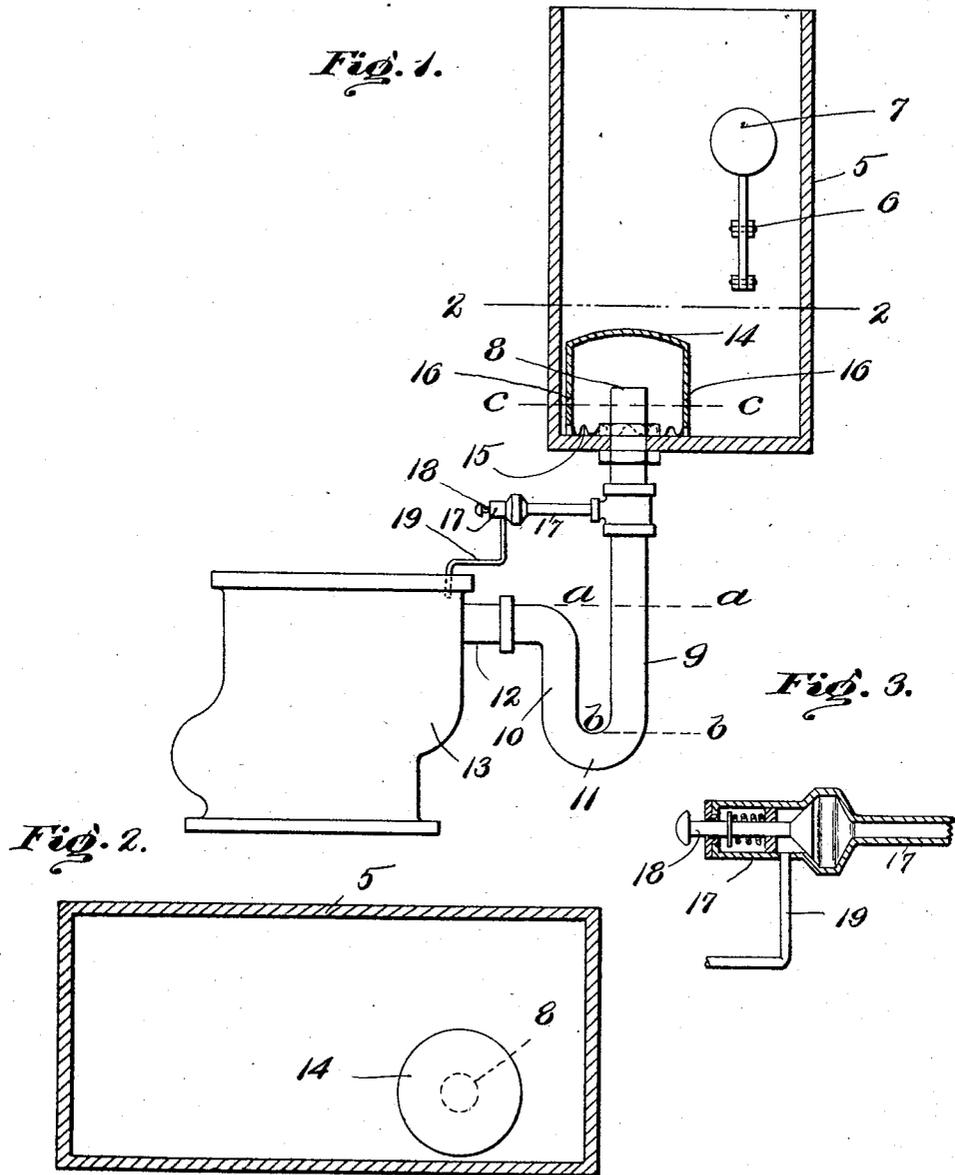


V. W. HARMON.
 FLUSHING APPARATUS.
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1,186,091.

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UNITED STATES PATENT OFFICE.

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FLUSHING APPARATUS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, VINAL W. HARMON, a citizen of the United States, residing at Dorchester, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Flushing Apparatus, of which the following is a specification, reference being had to the accompanying drawings, forming part thereof.

This invention has reference to improvements in flushing apparatus and particularly to flushing apparatus for hoppers of various kinds.

One object of the invention is to so construct a flushing apparatus of the nature herein described that a main body of water is held back by a body or column of air sustained by a column of water whereby, when the pressure of the main body of water becomes excessive or the volume of the body of air decreases to a predetermined point, the water seal is broken.

Another object of the invention is to produce a flushing apparatus of this nature in which the operation of the apparatus is comparatively noiseless.

Other objects of the invention will appear from the following description.

The invention consists in the means for confining a column of water at or below the flushing level together with means for receiving a volume or column of air between said column of water and the main flushing charge of water.

The invention also consists in the apparatus for receiving the volume of air having means through which said air may be removed.

The invention also consists in the means for releasing air from the volume or column of air.

The invention still further consists in such other novel features of construction and combination of parts as shall hereinafter be more fully described and pointed out in the claim.

Figure 1, represents a side elevation, partly in section, of the improved flushing apparatus shown in relation to a hopper of ordinary construction. Fig. 2, represents a plan sectional view of the same taken on line 2-2 Fig. 1, Fig. 3, represents a sectional detail view of a simple valve mechanism adapted to control the air outlet.

Similar characters of reference designate corresponding parts throughout.

In carrying this invention into practice I construct or provide the flushing tank 5 having the inlet or water supply pipe 6 furnished with any well known valve adapted to be operated by the usual ball or float 7 or in any known manner, under ordinary conditions, to control the height of water in said tank 5. Upstanding from the bottom of the tank 5 is the outlet pipe 8 having at its lower end a connection with the U-shaped trap having the arms 9 and 10 connected by the bend 11, the arm 10 terminating in the delivery pipe 12 which delivers to the hopper 13 at a point preferably above the bend 11.

Over the upstanding pipe 8 is placed the inverted cup or chamber 14 which has the saw-tooth edge 15 resting on the bottom of tank 5, whereby water is free to pass into said cup or chamber 14, and the wall of said cup or chamber is furnished with air passages 16, 16 located at or below the top of said pipe 8. Provision is made for permitting the escape of some portion of air from the chamber 14 or pipe 8 and in the present illustration of the invention such air escape comprises the air pipe 17 which, at one end, communicates with the pipe 8 and at its other end is furnished with the spring closed valve 18 and the drip pipe 19 which delivers into the hopper 13.

While the drawings are not drawn to scale it may be assumed that the internal area of pipe 8 is preferably in proportion to the area between the exterior of said pipe and the upright wall of chamber 14 as 1 to 2, but these proportions may be varied.

In the operation of the apparatus it is to be assumed that the arms 9 and 10 of the trap are filled with water about to the level $a-a$, the pressure of the water in one arm 9 approximately balancing the pressure in the other arm 10, and that pipe 8, above said level $a-a$, and chamber 14 contain air. Water supplied to tank 5 will now enter said chamber 14 under its edge 15 and will rise in said chamber while the water in tank 5 rises and covers the air passages 16, 16, after which the rise of water in tank 5 exerts pressure on the air in chamber 14 and pipe 8 which ultimately may result in forcing the column of water in arm 9 of the trap downward until the pressure of the column of water in arm 10 balances the pressure of water in the tank 5. At such time the water level in pipe 8 would be at or about the line

5 $b-b$ while the water level in the chamber 14 would be at or about the level $c-c$. The water forced from the arm 10 constitutes the refill for the hopper. If now air is permitted to escape from any point between the water levels $b-b$ and $c-c$ as by opening valve 18, such air will be replaced by water and the large volume of water entering pipe 8 from said chamber will overcome the resisting pressure of the water in arm 10 of the trap sufficiently to force a portion of the water through delivery pipe 12 which water, in motion, will effect a siphoning action on the water remaining in said arm 10 and on the water following from the tank 5. When the water level in the cup or chamber 14 falls below the air passages 16, 16 air enters said chamber 14, breaks the siphon and supplies air above the column of water in pipe 8 which water passes into the trap. The entrance of air through the passages 16, 16 continues until the water in the tank rises above said passages, so that a body of air is supplied which fills the chamber 14 and said pipe 8 and is somewhat compressed by the pressure of the water in tank 5, as above described.

30 The apparatus as herein shown is supplied with a low tank so called because of its proximity to the hopper. When however the tank is placed considerably above the

hopper the pipe 8 is extended accordingly and the air outlet pipe 17 is either lengthened to locate the operating device of valve 18 in a convenient position or some other air outlet device is used having operating means located in a convenient position.

The chamber 14 preferably is of crockery mainly to reduce the cost but it is evident that said chamber may be made of glass, metal or any suitable material and said chamber 14 may or may not be fixed in place.

5 With this apparatus the water from tank 5 cannot overflow the upper edge of said tank provided said tank is of a height greater than the column of water adapted to be sustained by the water in arm 10 of the trap.

Having thus described my invention I claim as new and desire to secure by Letters Patent.

Flushing means comprising a hopper, a trap for retaining water at a point below its delivery to said hopper, a flushing tank, a water supply pipe extending from said trap and having an open end extending within said tank, a chamber covering said open end of said pipe and having water passages and air passages below said open end of said pipe, and a valve controlled air escape pipe communicating with said supply pipe.

VINAL W. HARMON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."