

No. 667,352.

Patented Feb. 5, 1901.

F. WALKER.  
FLUSHING APPARATUS.

(Application filed Sept. 7, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

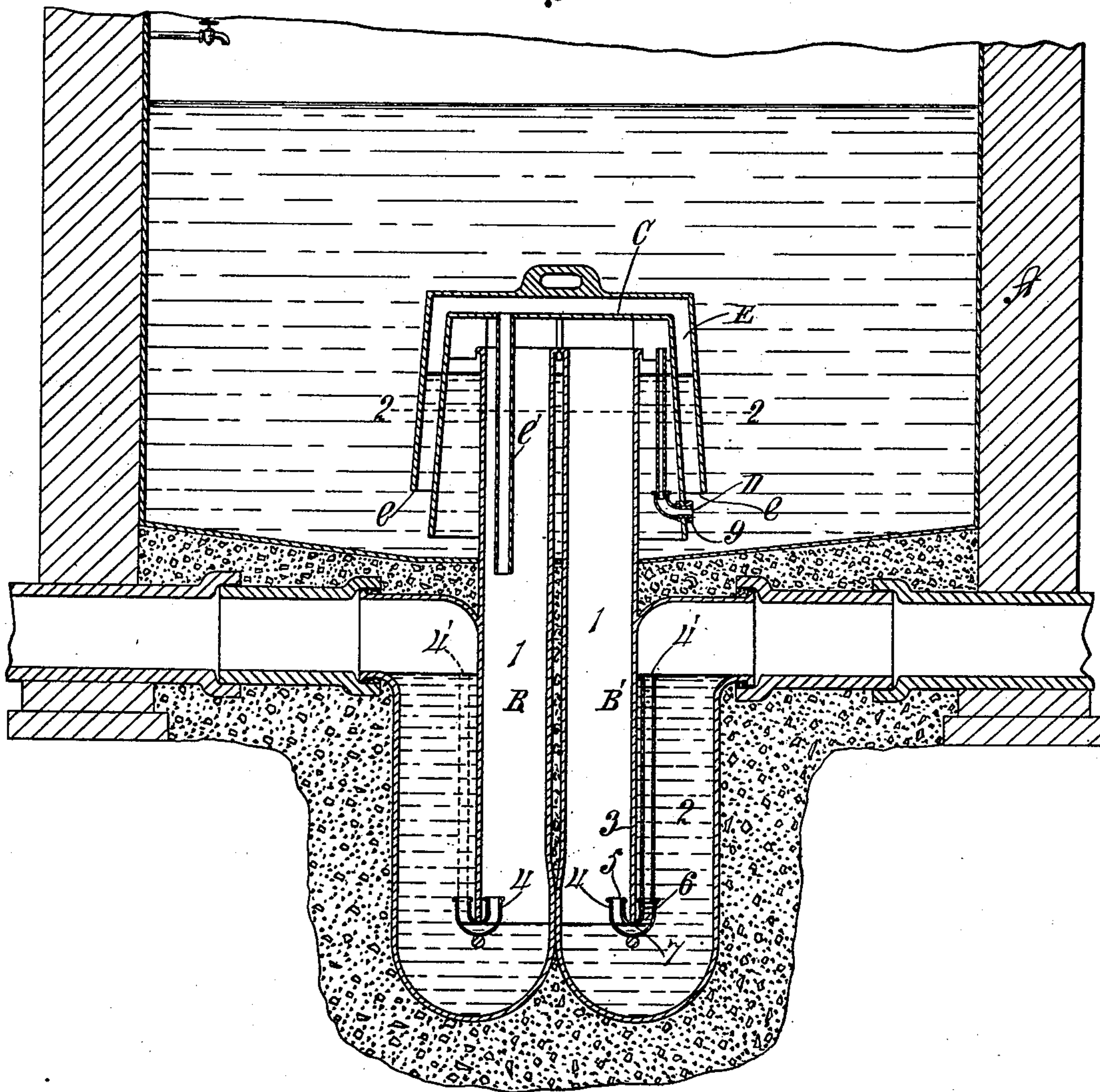
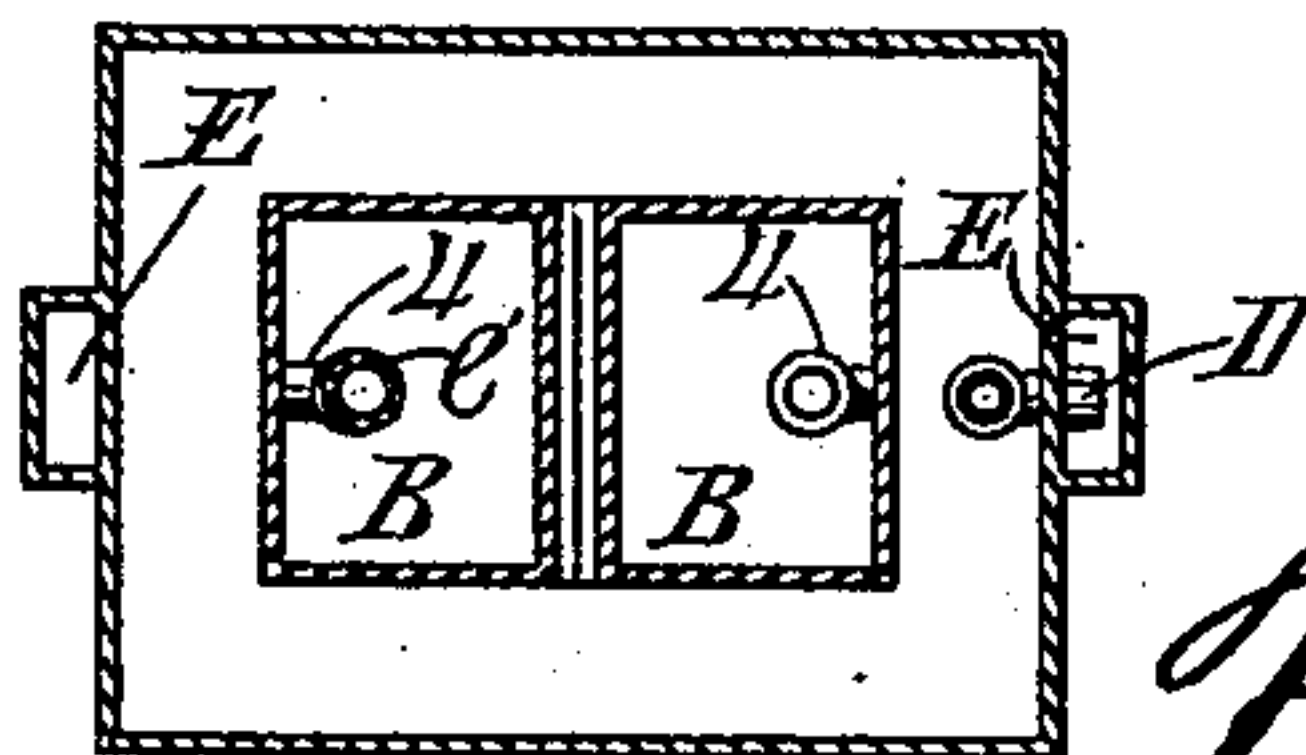


Fig. 2.



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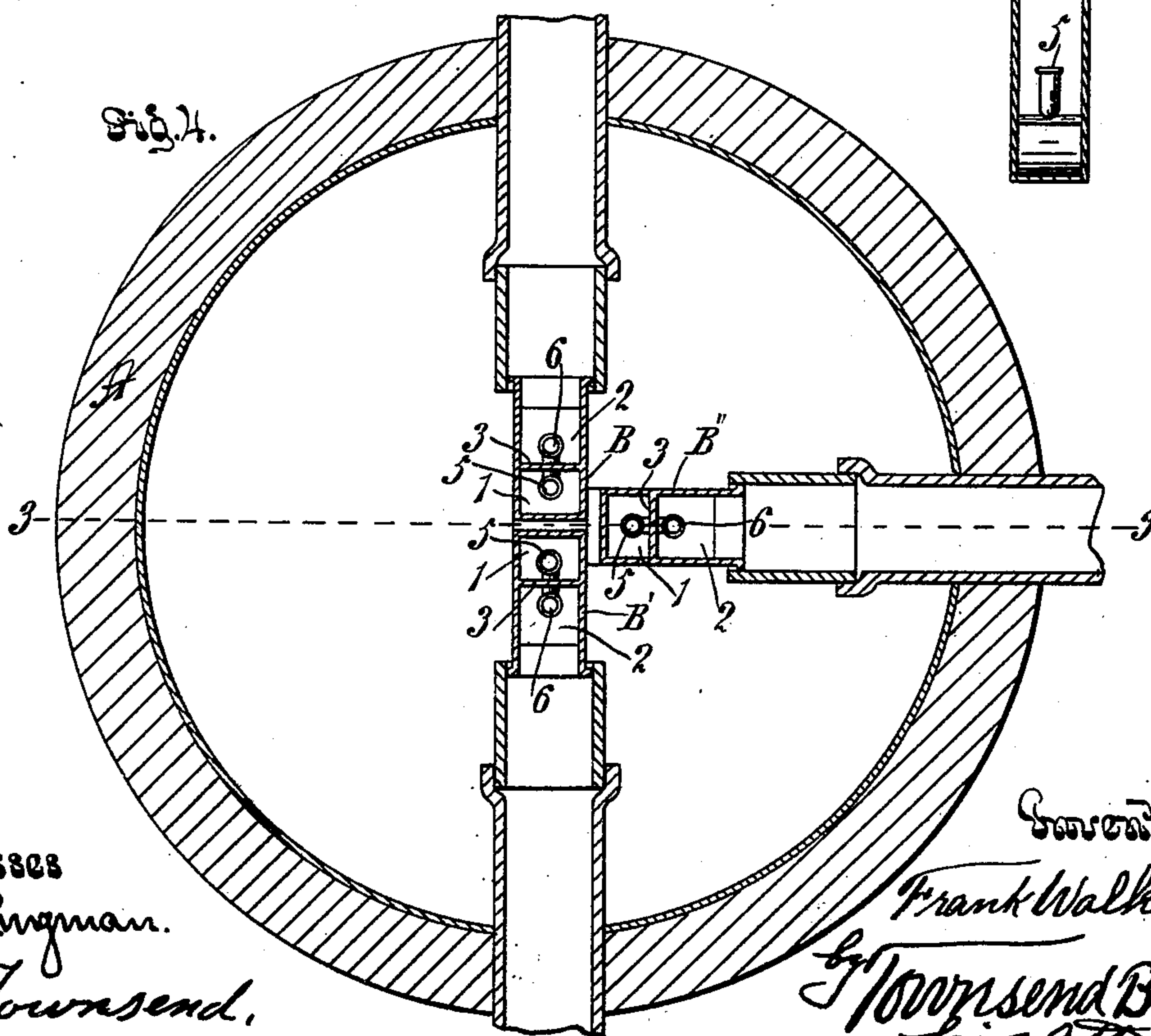
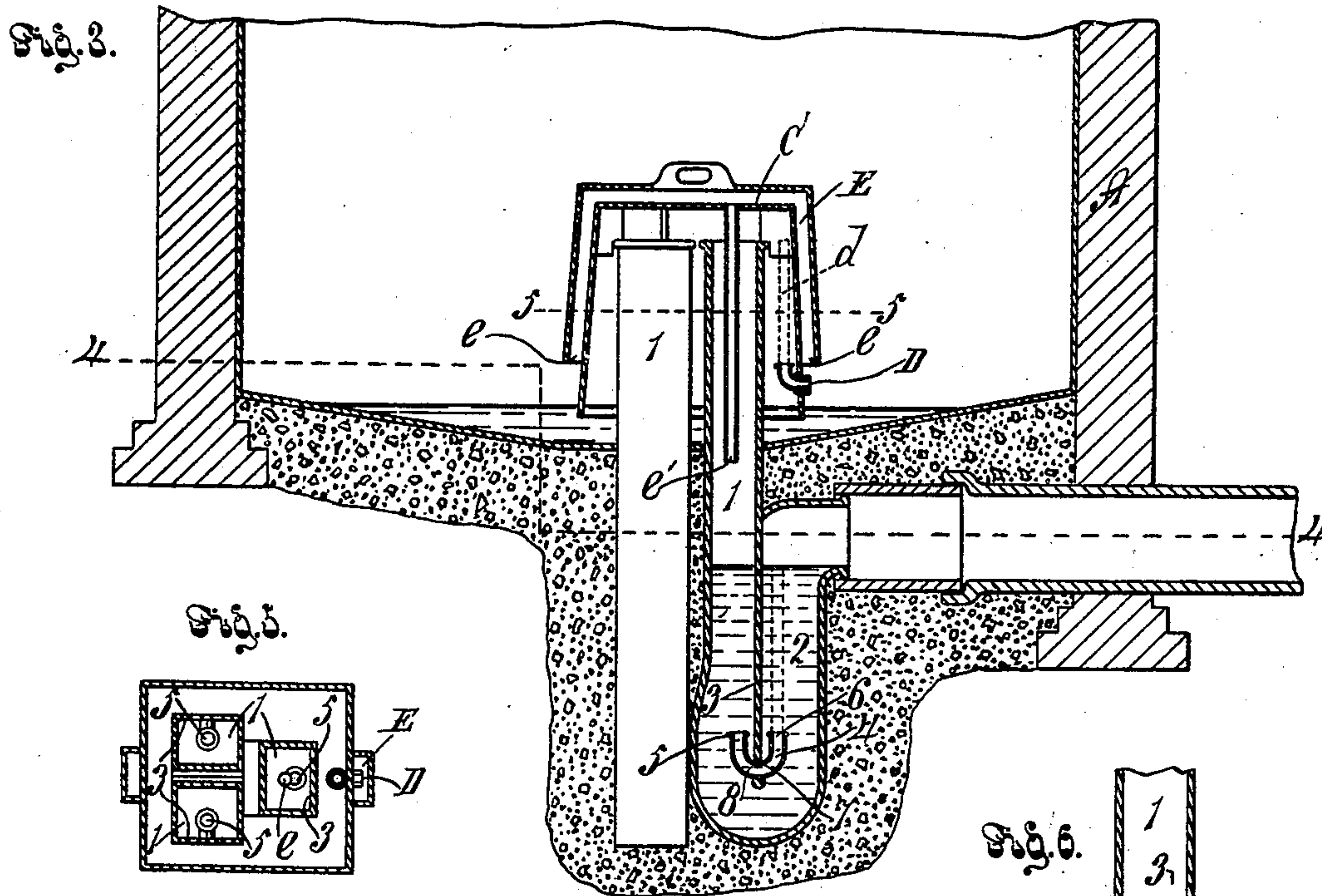
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# UNITED STATES PATENT OFFICE.

FRANK WALKER, OF LOS ANGELES, CALIFORNIA.

## FLUSHING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 667,352, dated February 5, 1901.

Application filed September 7, 1899. Serial No. 729,693. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK WALKER, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Flushing Apparatus, of which the following is a specification.

My invention more particularly relates to apparatus for flushing sewers, but may be used in other situations when desired.

One object of my invention is to reduce the cost and labor of constructing the siphons.

Another object of my invention is to provide means for absolutely breaking the siphonage and recharging the siphon with air under all conditions in which the sewer may be found. In order to cause the flushing to invariably take place, even when the sewer is clogged, so that the discharge from the flush-tank is slow, it is necessary that the device for recharging with air shall not break the siphonage too soon, for in such case the water within the dome will fall from under the dome into the tank and will be sufficient to seal the mouth of the recharging inlet or duct, thus preventing sufficient air from entering the dome, so that when the tank is again filling the confined air will not have sufficient body to force the water down to the bend of the trap when the water in the dome again rises to the mouth of the discharge-limb, and the consequence is that the water will flow over the mouth of the discharge-pipe and will flow through the trap just as fast as it runs into the tank and will not start the siphon into action. Heretofore various arrangements of the recharging device have been provided. Among these may be mentioned a pipe which enters the dome a short distance above the mouth of the dome and extends up in the dome to a point above the top of the discharge-pipe which leads from the dome. With such an arrangement when the air begins to enter the dome it will flow so rapidly into the top of the dome that it will break the siphonage before the water in the tank has fallen to the level of the bottom of the dome, and consequently the water in the dome will drop back and will raise the level of the water in the tank, so as to seal the mouth of the inlet. To avoid this difficulty, it is necessary that the pipe shall be of very small caliber. Such

pipes will soon become clogged by deposits of matter held in solution in the water. Pipes of such small caliber and great length are also objectionable on account of their liability of becoming damaged in handling the dome.

Another object of my invention is to provide a cheaper way for constructing the traps for starting the siphon into action.

A further object of my invention is to provide more convenient and economic means for flushing a plurality of sewers from a single flush-tank. Heretofore when two or more sewers were to be flushed from one tank it has been the custom to put in one large siphon and to divide the water at the mouth of the discharge end of such siphon by either putting on a T branch or putting two or more discharge-outlets onto the discharge end of the trap. This required special patterns for the several-sized siphons to be used for one, two, or three sewers, as the case might be. With my construction the lower part of the siphon will serve indiscriminately for either one, two, three, or four sewers flushed from one tank, the difference only being in the dome, which is of greater or less size, according to the number of sewers to be flushed from the one tank.

Another feature of my invention consists in a novel construction of the discharge-pipe which takes the water from the inside of the dome. In this novel feature of my invention I have provided an integral discharge-pipe in which the intake-limb and discharge-limb are parallel with each other, and the outlet of the discharge-limb is between the planes of the ends of the intake-limb, and a web separates the parallel passages of said limbs and connects the side walls of the discharge-pipe, and a bend connects the lower ends of said passages below the web, and another bend forms a vent-passage through the web and has its intake-mouth above and close to the bottom of the vent-bend and at a considerable distance below the level of the outlet from the discharge-limb. By this means I am able to provide in a single simple and cheap casting a most effective discharge-pipe to take the water from beneath the dome and to discharge it horizontally into a sewer, but slightly below the bottom of the tank, and which will invariably bring the siphon into



action by the release of the air when the water in the tank reaches the predetermined height.

The accompanying drawings illustrate my invention.

Figure 1 is a vertical mid-section of my improvement applied in a flush-tank for simultaneously flushing two sewers. In this view the water is shown in position immediately before the siphon is started into action. In this view I have shown the recharging device supplied with a pipe leading upward from the enlarged portion thereof to the level of the mouth of the discharge-pipe. This pipe may be used; but it is preferable to dispense with it for reasons hereinafter stated. Fig. 2 is a plan section on line 2 2, Fig. 1. Fig. 3 is a vertical section, on line 3 3, Fig. 4, of a flush-tank provided with my invention as applied for simultaneously flushing three sewers. This view shows the tank after the water has been discharged. In this view the pipe *d* is dispensed with. The position which said pipe would occupy, if used, is indicated by dotted lines. Fig. 4 is a sectional plan on line 4 4, Fig. 3. Fig. 5 is a plan section on line 5 5, Fig. 3. Fig. 6 is a sectional elevation showing the lower end of the diaphragm of the discharge-pipe with a return-bend pipe passing through it.

A indicates the receptacle of the flushing device.

B B' B'' indicate discharge-pipes respectively trapped at the lower end and opening from the receptacle.

C indicates a single dome inclosing the open upper ends of the pipes B B' in Fig. 1, and C' in Fig. 3 indicates a like dome inclosing the open upper ends of the pipes B B' B''. (Shown in Fig. 4.) Either dome extends below the open upper ends of the discharge-pipes which it covers and for which discharge-pipes it forms one common shorter leg of the siphons for the several discharge-pipes. The dome is provided with an air-duct opening from outside the dome above the bottom thereof and terminating inside the dome at a point above the inlet of said duct but not above the level of the mouth of the discharge-pipe. In each of the discharge-pipes the intake-limb 1 of the trap is separated from the discharge-limb 2 of said trap by a diaphragm or web 3, having a return-bend pipe 4 near the bottom thereof, said return-bend having its intake and discharge ends 5 6 terminating at points in the intake-limb and discharge-limbs, respectively, above the highest point 7 of the passage 8 through the diaphragm.

In the drawings the inlet-duct is shown as an elbow extending through the dome near the lower edge thereof and fastened by a lock-nut *g*, and the elbow is preferably used alone, the same being arranged with its upper opening *d'* wholly above the level of the inlet end of the elbow; but, if desired, a pipe *d* may be screwed into the elbow inside the dome and allowed to extend up to any desired height.

It will be understood that the small size of the inlet of duct D, the friction, and the capillary attraction within the duct will prevent any appreciable circulation of water through the duct, because the water passes more freely underneath the dome than it will pass through the duct. The danger of stoppage does not arise from the lodgment of material floating in the water, but does arise from the deposition of material, such as lime, held in solution. The small inlet-mouth of duct D is easily reached to remove any deposit which might be coated onto it, while the coating on the larger part of the duct will not have any appreciable effect to prevent the ingress of air into the dome and does not need to be removed except at long intervals.

In practical operation the vent-duct D will act alone and will ordinarily act to supply air to the inside of the dome to break the siphoning effect and will also operate to slowly recharge the siphon with air. It is necessary, in order for the duct D to operate in the manner specified, that it shall be of a comparatively small diameter at some point in its length. It is preferably reduced in diameter at the inlet end. Consequently there is a liability of its becoming clogged by matter carried by the water, and I therefore provide the dome with an additional duct E, of considerable size—say two inches in diameter. This duct terminates under the dome in a pipe *e'*, which extends into one of the discharge-pipes to a depth below the inlet end *e* of the duct.

In case the sewer becomes clogged and the discharge is so slow as to allow the siphonage to be broken by air entering through the duct D the duct E, with pipe *e'*, will quickly recharge the siphon with air after the siphonage has been broken by the air entering through the duct D or under the dome.

It is immaterial which discharge-pipe the pipe *e'* may enter into, and it need not be of a diameter as great as the inlet end *e* of the duct E. It may be of any desired size.

The return-bend pipe 4, which extends through the diaphragm 3, may terminate at any height in the discharge-limb 2 of the discharge-pipe, but preferably extends up to the level of the top of the trap, as indicated by the pipe 4' in Fig. 1.

The intake end 5 of the return-bend on the intake side 1 of the trap extends but slightly above the passage through the diaphragm, terminating below the level of the outlet-mouth of the limb 2 of the trap, so that the intake-mouth 5 will always be submerged except when the trapped liquid is displaced by the compressed air. This arrangement insures that the trap 4 will always be sealed by the liquid which seals the main trap 1 2.

In manufacturing the appliance the return-bend pipe 4 is put in the core of the casting and the metal of the diaphragm is cast around it. The return-bend is preferably of ordinary stock-fittings.

When it is desired to use the pipe 4' in ad-



dition to the bend 4, the pipe will be screwed into the return-bend before the same is placed in the core. The return-bend and pipe will be filled with loose sand and the whole will be inclosed in the core.

In practice where two or more sewers are to be flushed from a common point a single flush tank or receptacle A will be provided, and the several discharge-pipes leading from the tank into the several sewers will be placed with their intake-limbs 1 close together and the discharge ends in proper position to connect with their respective sewers. Then the inlet ends of all the pipes will be covered by a single dome, as at C or C'.

Care is to be taken that the space outside of the upper ends of the discharge-pipes and the inside of the dome limited between the overflow-level of the top of the discharge-pipes and the inlet and sealing mouth e of the duct E or the inlet and sealing mouth of the inlet-duct D, where duct D is used alone, is greater than the combined seals of the several traps on their intake sides.

By the "seal" of the trap is meant the space between the highest level which the water reaches in the intake side of the trap when such water is at rest, as shown in Fig. 3, and the level of the water at the lower end of such intake side when the air escapes through the return-bend, as shown in Fig. 1. If such space were not larger than the total volume of all of said seals, the air, being compressed by the pressure of the water when the tank is nearly full, and therefore occupying less space than when the air is first sealed, would allow the water to run over the top of the intake members 1 of the discharge-pipes, and therefore the air would not be blown out through the return-bend and the siphon would not be brought into action.

In practice the traps at the lower ends of the discharge-pipes are to be filled with water before the dome is put in place. After the dome is put in place water will be allowed to fill the tank in the ordinary manner, and as it rises will first seal the mouth of the dome, then the mouth of the duct D, and then the mouth of the duct E, the further rising of the water producing an increasing air-pressure until the water in the intake-limbs of the traps is forced downward by the air-pressure in the siphons to a level with the highest point 7 of the passage through the diaphragms 3. The moment the water-level within the intake-limbs of the discharge-pipes falls below said highest point 7 the air escapes upward through one of the return-bends, thus bringing the siphons into action and practically flushing all the sewers equally simultaneously.

Now, having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A flushing apparatus for a plurality of sewers, comprising a suitable receptacle, a plu-

rality of discharge-pipes, each being separately trapped at the lower end and opening from said receptacle and into its respective sewer; and a single dome in said receptacle inclosing the open upper ends of said pipes and extending below said open upper ends and provided with an air-duct opening from outside the dome above the bottom thereof and terminating inside the dome at a point above the inlet of said duct.

2. A flushing apparatus for a plurality of sewers, comprising a suitable receptacle; a plurality of discharge-pipes, each being separately trapped at the lower end and opening from said receptacle and into its respective sewer; and a single dome in said receptacle, inclosing the open upper ends of said pipes and extending below said open upper ends; and an air-duct being provided leading from the outside of the dome to the space beneath the dome for the purpose set forth.

3. In a flushing apparatus, a discharge-pipe consisting in an integral body comprising an intake-limb, a discharge-limb which is parallel with and is wholly on one side of said intake-limb and has its outlet between the planes of the ends of the intake-limb, and above the trap, a web separating the parallel passages of said limbs and connecting the side walls of said discharge-pipe, a bend connecting the lower ends of said passages, below said web, and a bend forming a vent-passage through the web and having its intake-mouth above and close to the bottom of the vent-bend and at a considerable distance below the level of the outlet from the discharge-limb.

4. A flushing apparatus for a plurality of sewers, comprising a plurality of discharge-pipes, each being separately trapped at the lower end and opening from a suitable receptacle and into its respective sewer; and a single dome inclosing the open upper ends of said pipes and extending below said open upper ends; said dome being provided with a port leading upwardly from near its bottom and then extending down into a discharge-pipe to a point below the level of the inlet of said port.

5. The combination with a plurality of sewers, of a plurality of discharge-pipes, each being provided with a separate trap at the lower end and opening from a suitable receptacle and into its respective sewer; such receptacle; and a single dome inclosing the open upper ends of said pipes and extending below said upper open ends; said dome being provided with an air-duct opening from outside the dome above the bottom thereof and terminating inside the dome at a point above the inlet of said duct.

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