

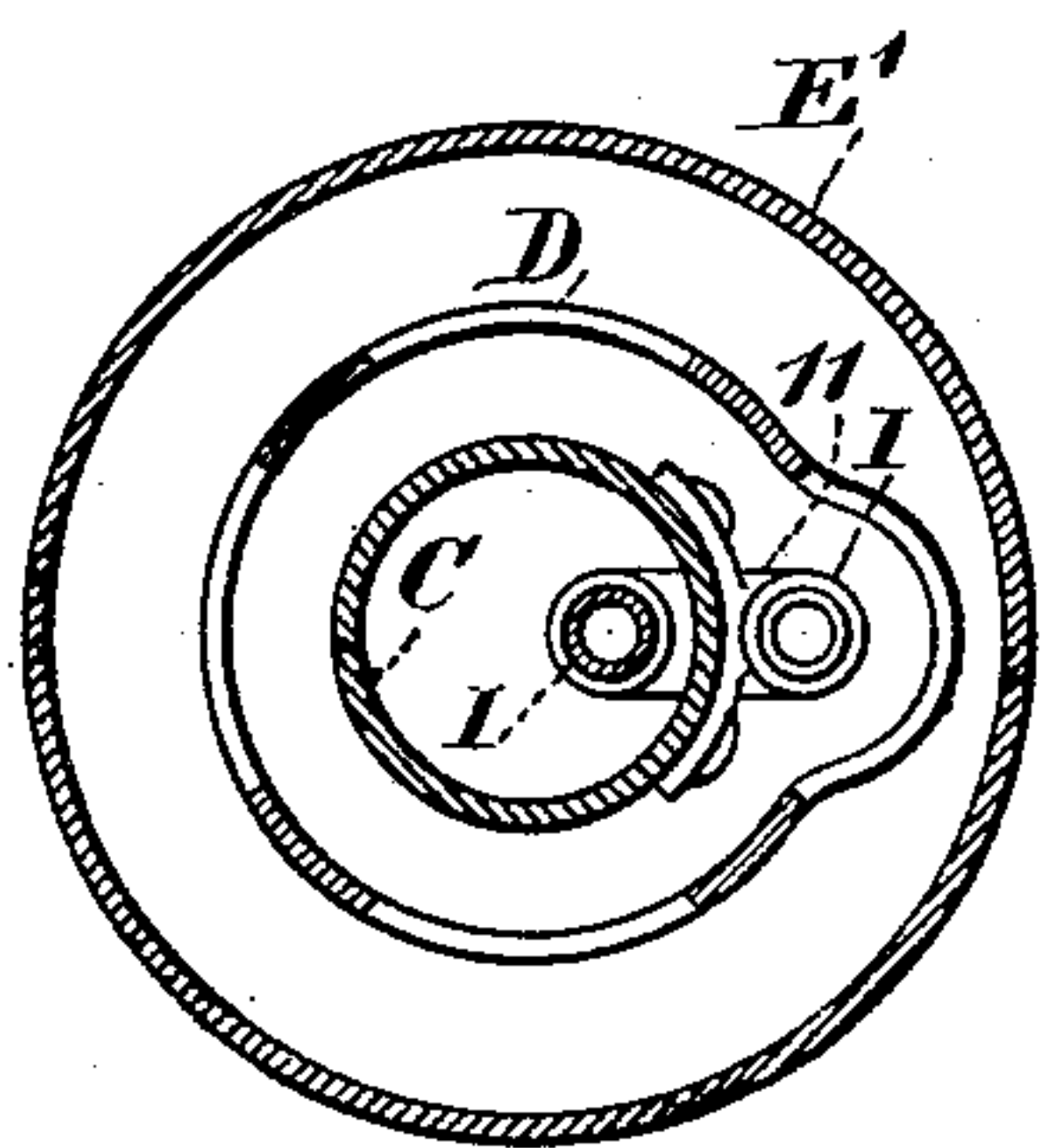
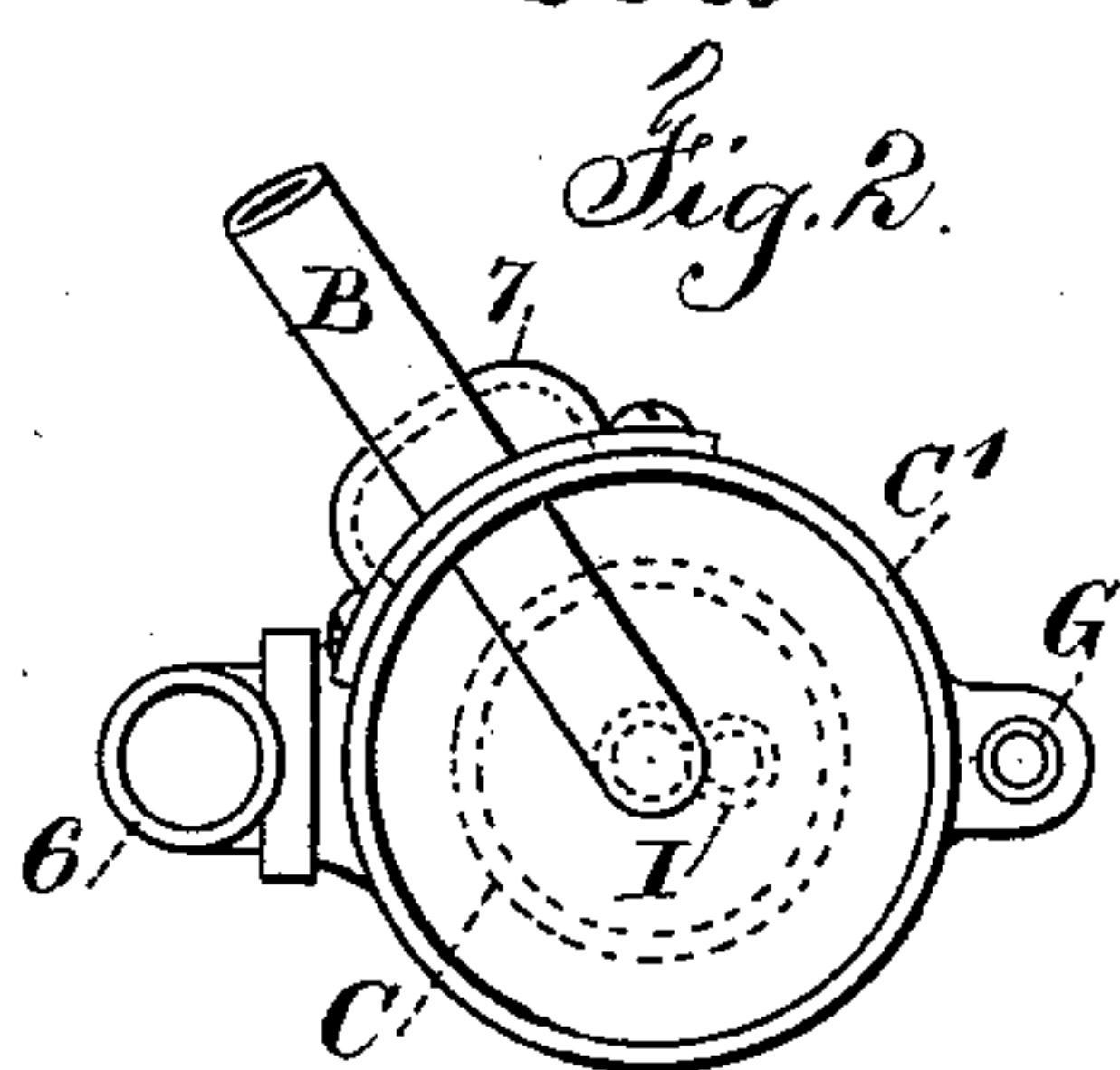
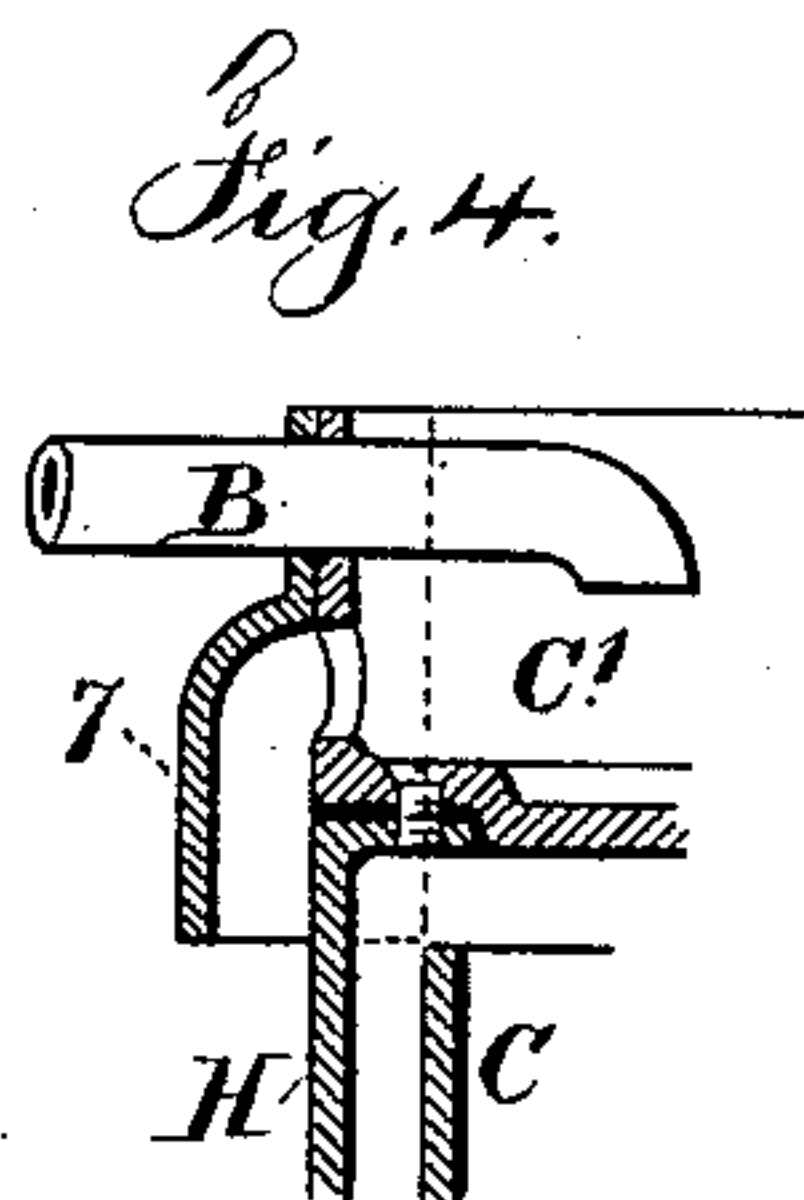
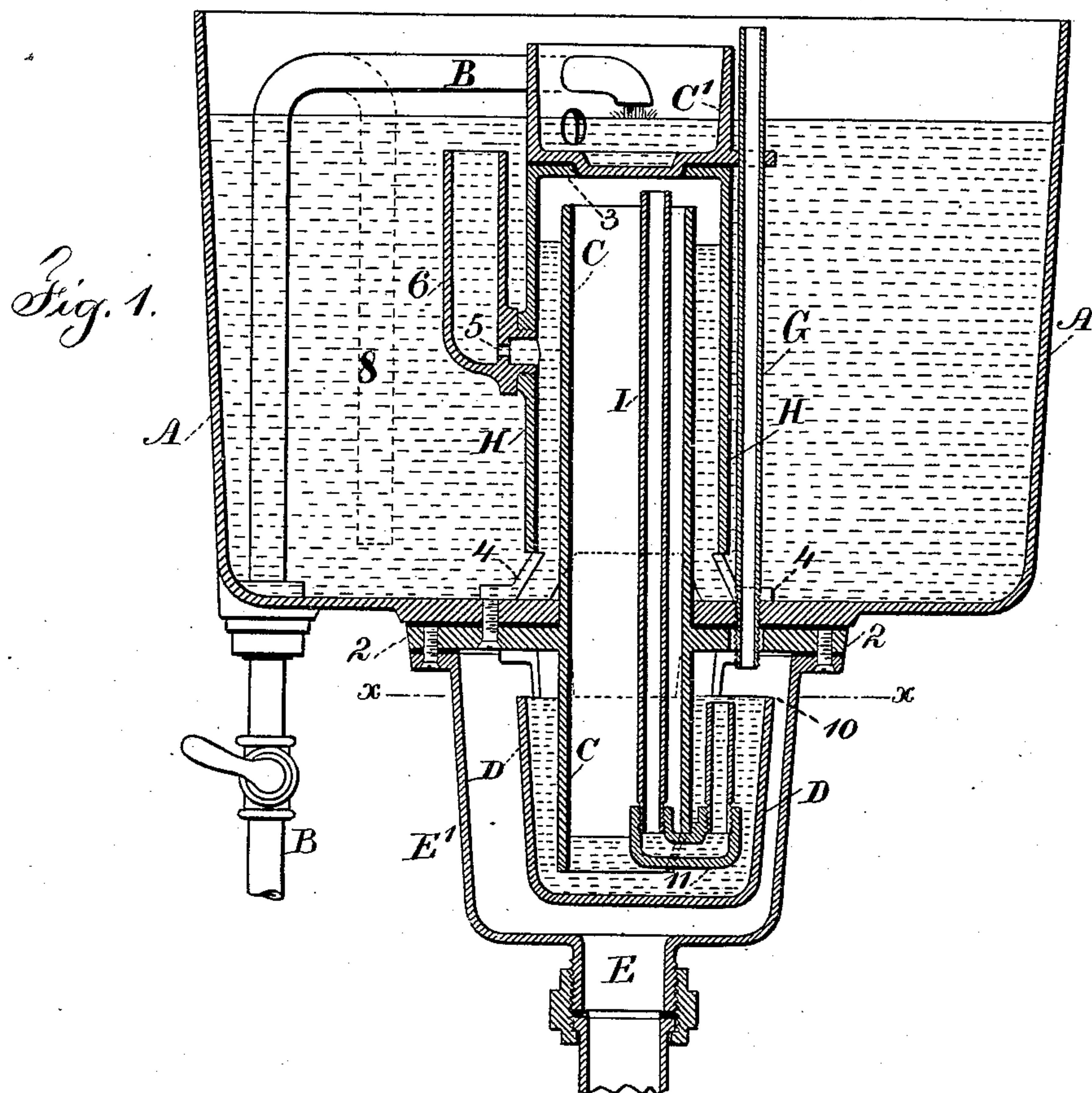
(No Model.)

J. DEMAREST.

FLUSHING CISTERN OR TANK FOR WATER CLOSETS.

No. 475,489.

Patented May 24, 1892.



Witnesses

Chas N. Smith  
J. Stail

Fig. 3.

*Inventor.*

John Demarest  
per Lemuel W. Serrell  
Atty.



# UNITED STATES PATENT OFFICE.

JOHN DEMAREST, OF NEW YORK, N. Y., ASSIGNOR TO THE J. L. MOTT IRON WORKS, OF SAME PLACE.

## FLUSHING CISTERN OR TANK FOR WATER-CLOSETS.

SPECIFICATION forming part of Letters Patent No. 475,489, dated May 24, 1892.

Application filed November 9, 1891. Serial No. 411,291. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN DEMAREST, a citizen of the United States, residing in the city and State of New York, have invented an Improvement in Flushing Cisterns or Tanks for Water-Closets, Urinals, Sewers, &c., of which the following is a specification.

Automatic flushing-cisterns have heretofore been constructed in which there is a supply-pipe through which water is allowed to run continuously in a stream of a size proportioned to the quantity of water desired for flushing the closet or urinal, and when the cistern is filled to the predetermined point, a siphon is brought into action automatically to empty the cistern, or nearly so, with rapidity, and after the cistern has been nearly emptied air has passed into the siphon to stop its further action until the cistern has again been filled, or nearly so.

In cisterns of this character considerable difficulty has arisen in consequence of the siphon continuing in operation in such a manner that the overflow from the cistern corresponds to the inflow, thus destroying the flushing operation.

My present invention is for simplifying the construction of the parts and rendering the operation more reliable and regular than it is in cisterns of this character heretofore constructed, and my invention relates to the combination of devices hereinafter set forth and claimed.

In the drawings, Figure 1 is a vertical section representing the improved flushing-cistern. Fig. 2 is a plan view. Fig. 3 is a sectional plan at the line X X, and Fig. 4 is a detached section of the deflector and cup.

The cistern A is of suitable size, according to the use intended, so as to contain the proper quantity of water. This cistern is preferably of cast-iron; but tanks for sewers, &c., can be of brick-work, cement, or other materials, and the supply-pipe B is provided with a cock or valve for regulating the rapidity of flow of the water.

Through the bottom of the cistern is an opening, into which is received the standing portion C of the siphon, and this is preferably fastened by a flange 2, bolted to the under side of the cistern, and surrounding and

extending downwardly from the flange 2 is a flushing-cup D within the enlarged upper end E' of the flushing-pipe E, which latter extends to the closet or urinal to be flushed, and there is an air-pipe G passing up through the flange 2 and above the water-level in the cistern A. Around the standing pipe C is the siphon-pipe H, having a closed upper end 3 above the top end of the standing pipe C, and this siphon-pipe H is preferably made with legs 4, screwed to the interior of the cistern A, and there is through this siphon-pipe H a hole at 5, with a tubular shield 6 extending up from such a hole as high as the top of the siphon-pipe H, and when desired the top or cover C' of the stand-pipe C is made in the form of a cup having an outlet at one side and a deflector 7, and to lead the supply-pipe B to this cup, so that the water running into the cup is directed downwardly by the deflector 7, so that it runs down the exterior of the siphon-pipe H into the water within the cistern without making the noise which frequently arises from the water falling directly into the water in the cistern; but I remark that, if desired, the pipe B may be turned downwardly, as indicated by the dotted lines at 8, such pipe extending to near the bottom of the cistern A.

I make use of an inverted siphon air-pipe I, the long leg of which is within the siphon stand-pipe C and the short leg of which rises within the flushing-cup D to near the water-level 10, or nearly so, and I find it convenient to make this inverted siphon-pipe of two pieces of tube screwed into the return-bend 11, which has lugs upon it by which it is connected with the lower end of the standing pipe C, such pipe C being notched at the place where the return-bend passes through it, in order that the bend of the siphon may be above the lower end of the stand-pipe C, so that such inverted siphon may be freed from water by the pressure of air before the water-level descends to the bottom of the pipe C.

The joints in this apparatus are to be made air and water tight in any usual manner by the insertion of putty or cement.

The operation of the device is as follows: After the apparatus has been put up water is to be poured into the same, preferably



through the air-pipe G, until the cup D is filled and overflows at the level 10, and the supply-valve to the pipe B is adjusted to allow the water to run at the desired speed.

5 The water now accumulates and rises around the standing pipe C and passes above the hole 5, closing the same, and the air is now confined between the water-level, as represented in the drawings—that is to say, between the water  
10 in the siphon-pipe H and the water in the flushing-cup D. As the water continues to rise it eventually passes above the upper end of the tubular shield 6, and during this operation the height of the column increases,  
15 causes the water to rise between H and C, and presses down the water within the standing pipe C and in the inverted siphon-pipe I correspondingly, and the water overflows from the flushing-cup D into the enlarged upper  
20 end E' of the stand-pipe E, and the parts are so proportioned that the air is forced down and escapes through the siphon-pipe I before the water-level within the siphon H reaches the top end of the standing pipe C, and the  
25 moment the water is displaced from the pipe I the pressure of air in the entire siphon of the apparatus is relieved, and the water-level, being considerably above the upper end of the siphoning apparatus, fills the pipe C and  
30 the siphon-pipe I, and it continues to flow and rush over the edge of the cup D down through the flushing-pipe E until the water-level descends as low as the bottom of the siphon-pipe H, and when the air is drawn in  
35 at the bottom of such pipe H by the siphoning action the further suction of such siphon is suspended and the siphon H and pipe C fill with air as the water descends to the level 10 of the upper edge of the flushing-cup D.

40 If the hole 5 and shield 6 were not employed, a few bubbles of air passing below the lower end of the siphon-pipe H might partially stop the siphoning action, because the column of water within the siphon-pipe H  
45 would partially drop and the supply of water by the pipe B might be sufficient to raise the water-level and prevent additional air passing into the siphon. Under these circumstances the siphon might continue to act and  
50 draw off as much water as runs into the cistern, thereby producing a continuous flow to the closet or urinal instead of a flushing operation. This difficulty is prevented by the use of the hole 5 and shield 6, because as the  
55 water-level descends in the cistern A it also descends in the tubular shield 6, the water within the latter being drawn back through the hole 5, and the parts are so proportioned that the water in the tubular shield 6 is drawn  
60 out at about the same time that the water-level reaches the bottom of siphon-pipe H. The consequence is that when the air rushes in below the siphon-pipe H and the column of water in the siphon-pipe H drops air continues to pass in through the hole 5 to equalize the pressure within the siphon. For this reason the pressure of the air within the si-

phon is always equalized by the small jet admitted through the hole 5 before the water-level as it rises comes to the level of such hole 5 70 and closes the further admission of atmosphere. Hence it is impossible for this siphon to remain partially in operation, and the siphoning action is broken reliably immediately after the siphoning has taken place and a 75 uniform action of such siphon periodically for flushing purposes is insured.

I claim as my invention—

1. The combination, with the cistern and flushing-pipe, of a flushing-cup within the 80 flushing-pipe, a standing siphon-pipe with the open lower end within the flushing-cup and rising within the cistern, a siphon-pipe with a closed upper end and open lower end surrounding the standing pipe, a tubular 85 shield 6, connected with the siphon-pipe at one side thereof, there being a hole in such siphon-pipe at the lower end of the shield, and an inverted siphon-pipe having a long leg within the standing siphon-pipe and the 90 short leg opening at the water-level, or nearly so, in the flushing-cup, substantially as set forth.

2. The combination, with the cistern and flushing-pipe, of a flushing-cup within the 95 enlarged upper end of the flushing-pipe, a standing siphon-pipe with the open lower end within the flushing-cup and rising within the cistern, a siphon-pipe with a closed upper end and open lower end surrounding the stand- 100 ing pipe, there being a hole in such siphon-pipe, and an inverted siphon air-pipe having the long leg within the standing siphon-pipe and the short leg opening at the water-level, or nearly so, in the flushing-cup, the tubular 105 shield 6, surrounding and rising above the hole 5 in the siphon-pipe, the cup C' at the upper end of the siphon-pipe H, into which the water is discharged by the supply-pipe, and the deflector 7 at the opening in the side 110 of such supply-cup, substantially as set forth.

3. The combination, with the cistern and the supply-pipe and the flushing-pipe, of the flushing-cup, the standing pipe of the siphon opening at its lower end within the flushing- 115 cup, the siphon-pipe closed at its upper end, open at its lower end, and surrounding the standing pipe of the siphon, an inverted siphon-pipe, the long leg of which is within the standing pipe and the upper end of the 120 shorter leg at or near the water-level in the flushing-cup, there being an air-inlet opening into the siphon-pipe below the upper end of the standing pipe, and an air-pipe passing through the bottom of the cistern into the 125 flushing-pipe and rising above the water in the cistern, substantially as set forth.

Signed by me this 5th day of November, 1891.

JOHN DEMAREST.

Witnesses:

GEO. T. PINCKNEY,  
WILLIAM G. MOTT.