

(No Model.)

3 Sheets—Sheet 1.

H. J. FROST.

FLUSHING TANK FOR WATER CLOSETS.

No. 356,713.

Patented Jan. 25, 1887.

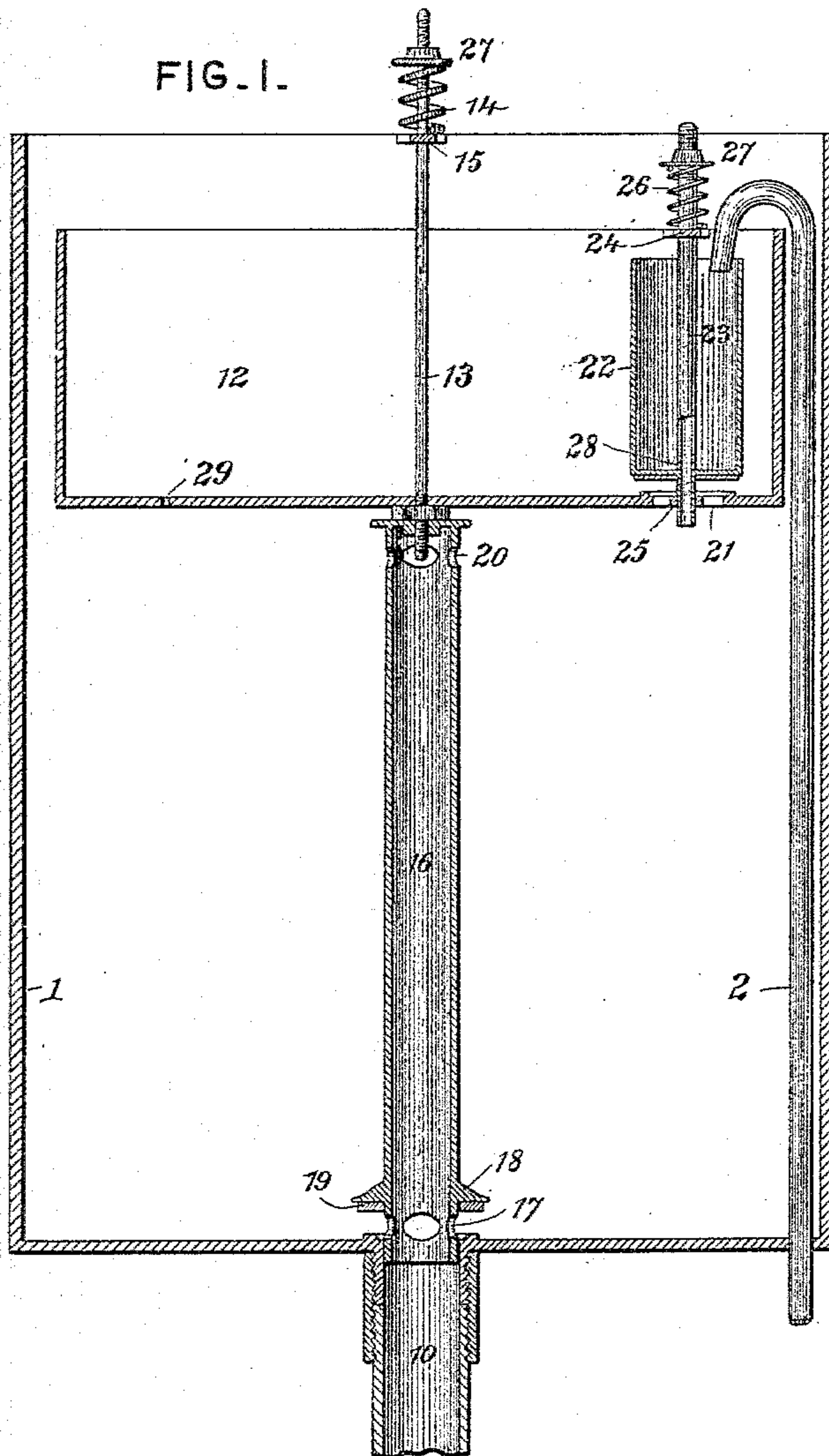
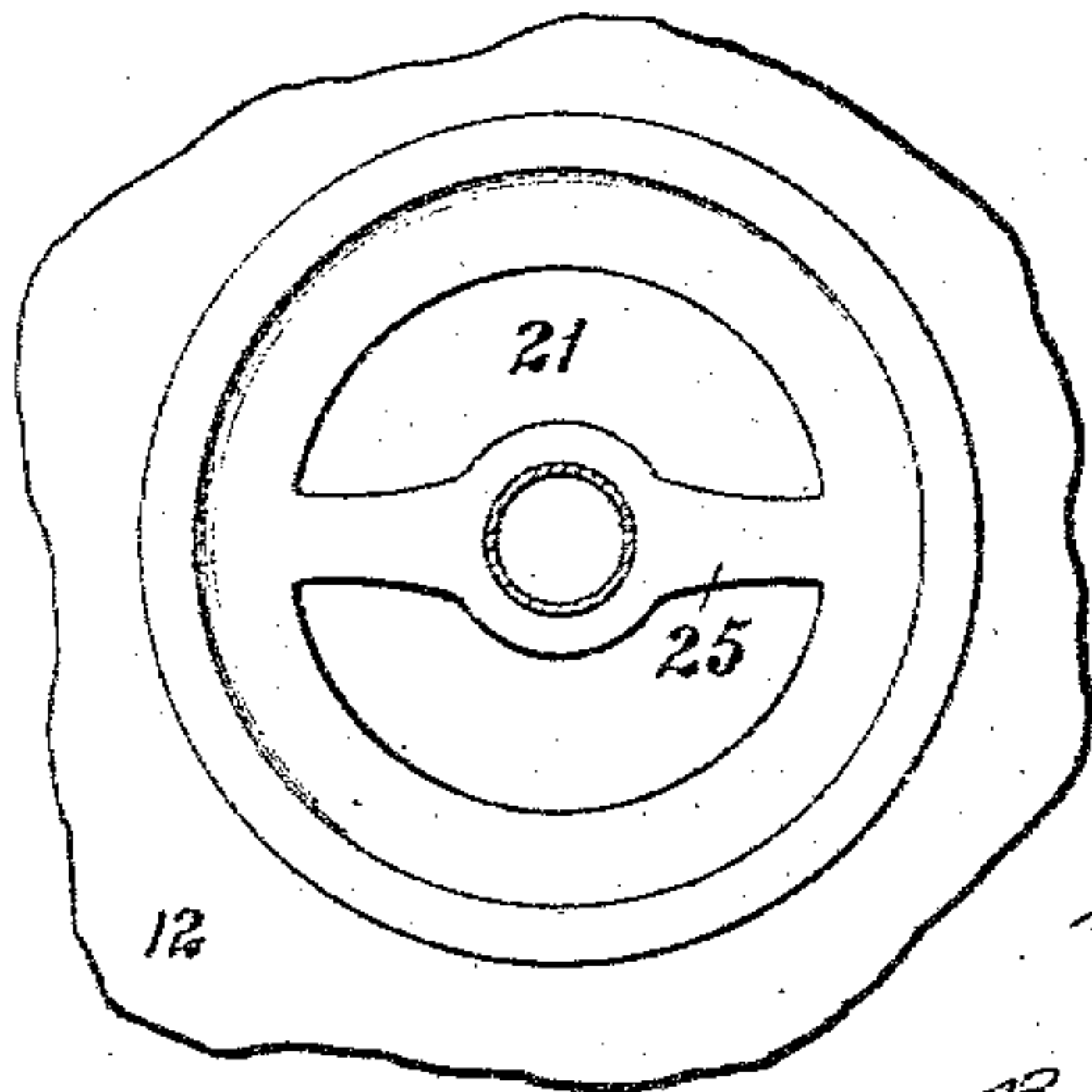


FIG. II.



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(No Model.)

3 Sheets—Sheet 2.

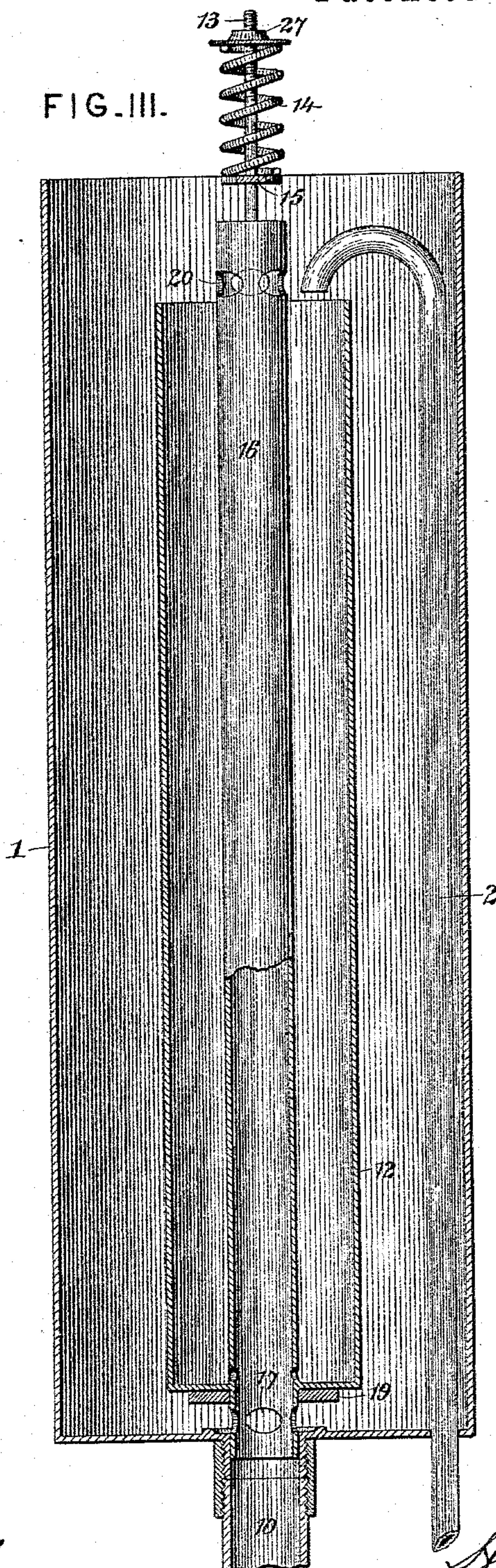
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FIG. III.



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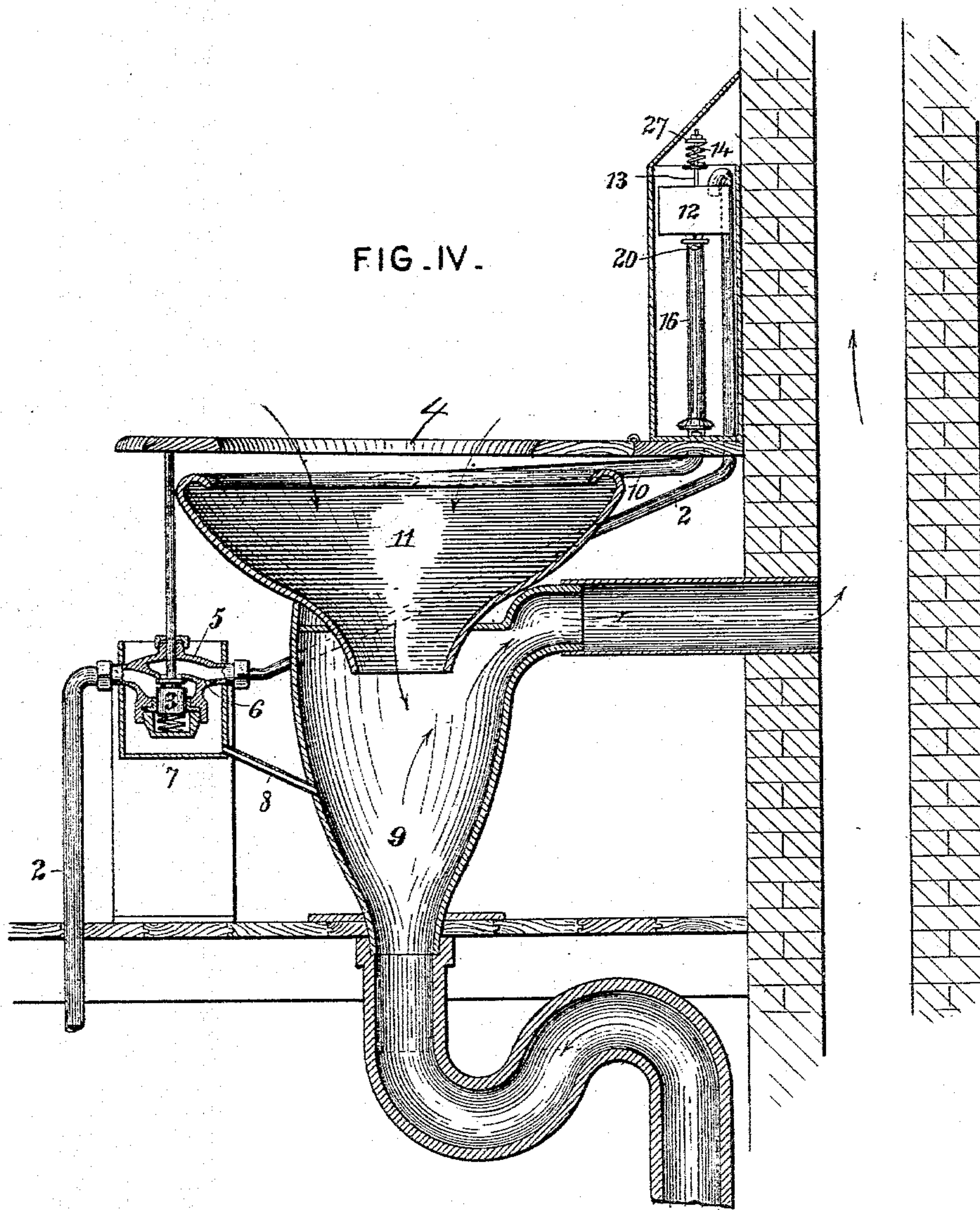
3 Sheets—Sheet 3.

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# UNITED STATES PATENT OFFICE.

HORACE J. FROST, OF WASHINGTON, DISTRICT OF COLUMBIA.

## FLUSHING-TANK FOR WATER-CLOSETS.

SPECIFICATION forming part of Letters Patent No. 356,713, dated January 25, 1887.

Application filed February 4, 1886. Serial No. 190,825. (No model.)

*To all whom it may concern:*

Be it known that I, HORACE J. FROST, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Flushing-Tanks for Water-Closets, of which the following is a specification.

My invention relates to a tank which shall act automatically in flushing the soil-pipe of a water-closet after each occupation of the seat, which shall be independent of the head of water in the service-pipes and shall lack the ordinary valves and chains or cords, which render such apparatus liable to become inoperative in cold weather by reason of stiffening by ice.

To these ends I place in the tank a basin rigid with the rod of the flushing-valve and arranged under the opening of the supply-pipe, which thus whenever the water is passing therethrough will fill the basin, and by depressing it close the flushing-valve and allow the tank to fill until the seat of the closet is vacated. In cases where a small amount of pressure in the service-pipe affords a small head of water I arrange an automatic valve operating on a principle identical with that of the main valve for closing the leak-hole in the main basin, thus expediting the action of the main valve.

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

Figure I is a vertical sectional view of the preferred form of my invention. Fig. II is a detail in plan, on a larger scale, of the guide for the supplemental valve-rod. Fig. III is a vertical sectional view of a modified form of the invention, adapted for use when the reservoir, for the sake of convenience or for obtaining a more rapid and powerful flushing action, is made of considerably greater height than width. Fig. IV is a sectional view of a water-closet embodying my invention.

1 may represent a flushing-tank of any preferred form. The simple character of the improved valve-action, however, especially adapts the invention for use with a tall narrow tank, from which a strong and rapid flow of water may be obtained. The cylindrical form of tank shown in Fig. III is one illustration

of this idea. The supply-pipe 2 may enter at the bottom of the tank, as shown, or at the side, and it is provided with a valve, 3, controlled by the seat 4 of the water-closet. Just above the valve-casing 5 the supply-pipe is provided with a leak-hole, 6, through which the water in said supply-pipe above the valve may escape, so that after the valve has closed all the water will drain off therefrom. To carry this waste-water to the sewer, as well as catch any leakage which may occur from the valve-packing, I surround the valve-casing with a catch basin or box, 7, having tube 8 leading to the soil-pipe 9 of the water-closet. 10 is the flushing-pipe connecting the bottom of the tank 1 with hopper 11.

12 is a basin hung by rod 13 and spiral spring 14 from a cross-bar, 15, supported on the upper edges of tank 1.

16 is a pipe or hollow valve-rod connected to the bottom of basin 12 and guided at bottom in the opening of the flushing-pipe 10.

Holes 17, near the bottom of pipe 16, allow the escape of water from the tank when the pipe is raised, as shown in the drawings; but when the pipe is forced down the holes 17 are closed by the walls of the discharge-pipe, and a flange, 18, on the pipe bearing a rubber washer, 19, effectually seals the tank.

20 are overflow-openings in pipe 16.

In Fig. I, at 21, the basin 12 is provided with a discharge-opening of sufficient size to insure the rapid exit of water above it.

22 is a supplementary basin carried by a hollow stem, 23, which is guided at top in a cross-bar, 24, fixed to the edges of basin 12, and at bottom by an arm, 25, fixed across the opening 21. (See Fig. II.) The basin 22 and its stem 23 are supported by a spiral spring, 26, in manner similar to the main basin 12. The tension of both springs may be regulated at will by nuts 27. Immediately above the horizontal portion of the basin 22 are small leak-apertures, 28. It will be seen that the upper end of the supply-pipe 2 is bent downward, so as to project over the edge of the basin 12 and into basin 22.

Besides the large hole 21 in the bottom of basin 12, for effecting the rapid discharge of water, I employ a smaller leak hole or holes, 29, which will insure the emptying of the



basin in case for any cause the opening 21 should be closed.

The operation of the apparatus shown in Figs. I and IV will now be readily understood.

5 The occupation of the water-closet seat will cause water to flow through the supply-pipe 2 and discharge into basin 22, which will fall when the resistance of the spring 26 is overcome and close the hole 21, the water first filling the basin 22, and then, by overflowing, the  
10 basin 12. When the water in basin 12 has attained sufficient weight to overcome the upward pressure of spring 14, it falls, closing the outlets 17 and allowing the flushing-tank to  
15 fill with the water overflowing the basin 12. Should the tank be filled to the height of the overflow-holes 20 before the water ceases to enter, it will escape therethrough and flow off through the soil-pipe. When, by vacating the  
20 water-closet seat, the water is cut off from pipe 2, the water in cup 22 will run off through holes 28 and hollow stem 23 to the tank 1 until the cup is reduced in weight sufficiently for the spring 26 to lift basin 22 and allow the  
25 water in basin 12 to rapidly run out through opening 21 into the tank 1. The spring 14 then lifts the basin 12 and hollow valve-rod 16, so that the water in the tank may quickly escape through openings 17 and flush the hop-  
30 per of the water-closet. This arrangement, including the supplemental basin 22, is especially intended for use where, from a regularly or periodically small water-supply, it is necessary to employ automatic means for closing  
35 the leak in basin 12 until a sufficient working-weight of water is obtained. When, however, sufficient water-supply is assured, or there is any lack of room for the complete device, an arrangement similar to that shown in Fig. III  
40 may be employed. Here the supply-pipe 2 opens directly into the basin 12, and the hollow valve-rod 16 extends completely to the top of said basin, being provided with flushing-openings 17, small leak-holes 21, and over-  
45 flow-openings 20. The operation of this modified form of the invention will be readily understood from a comparison with that of the complete form shown in Fig. I.

Having thus described my invention, the following is what I claim as new therein and  
50 desire to secure by Letters Patent:

1. The combination, with a flushing-tank having a discharge pipe or opening in its bottom and a supply-pipe opening thereinto, of a  
55 hollow valve-rod having a valve for closing said discharge-opening and overflow-holes at the desired distance from the bottom of the tank, a basin connected to said hollow rod beneath the mouth of the supply-pipe, leak-holes  
60 for permitting the escape of water from said basin, and a spring acting upon said basin in opposition to the weight of water contained therein, substantially as and for the purposes set forth.

65 2. In combination with a flushing-tank, a

supply-pipe, a valve and discharge pipe, a basin connected with said valve and upheld by a spring, a hole in said basin, and a second supplementary basin arranged under the opening of the supply-pipe and adapted to close  
70 said hole, substantially as and for the purpose set forth.

3. In combination with a flushing-tank, supply and discharge pipes, and a valve over the discharge-pipe, a basin connected to said valve,  
75 a spring for supporting said basin against the weight of water therein, a leak-hole in said basin, a supplementary basin adapted to cover said leak-hole and arranged under the opening of the water-supply pipe, a leak-hole for  
80 permitting the escape of water from said supplementary basin, and a spring for supporting said supplementary basin against the weight of the water therein, substantially as and for the purpose set forth. 85

4. The combination, with a flushing-tank having a discharge pipe or opening in the bottom thereof, and a supply-pipe, of a basin arranged beneath the opening of said supply-pipe,  
90 a spring acting in opposition to the weight of the water in said basin, a hollow valve-rod to which said basin is connected, guided at its lower end in said discharge-opening, and having near said lower end openings for the escape of water from said tank and at a suitable  
95 distance above the bottom of the tank overflow-openings, and holes for permitting the water to escape from the basin, substantially as and for the purpose set forth.

5. The combination, with a flushing-tank  
100 having a discharge pipe or opening in the bottom thereof, and a supply-pipe, of a basin arranged beneath the opening of said supply-pipe, a spring acting in opposition to the weight of water in said basin, a hollow valve-rod to  
105 which said basin is connected, guided at its lower end in the discharge-opening, and having at a suitable distance from the bottom of the tank overflow-openings, a valve secured to said rod and adapted to close the said discharge-opening, holes formed in said hollow  
110 valve-rod beneath said valve for the discharge of the water from the tank, and holes to permit the escape of water from the basin, substantially as and for the purpose set forth. 115

6. In combination with a flushing-tank having supply and discharge pipes, a valve in the discharge-pipe, and a basin connected to said valve for controlling the discharge of water,  
120 a leak-hole in said basin, a supplementary basin arranged under the opening of the supply-pipe and controlling the passage of water through said leak-hole, and an additional leak-hole unprotected by valve arranged in said main basin, substantially as and for the purpose set forth. 125

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Witnesses:

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