

(No Model.)

2 Sheets—Sheet 1.

V. ROYLE & J. ROYLE, Jr.

WASTE AND FLUSHING VALVE FOR WATER CLOSET VAULTS, &c.

No. 359,743.

Patented Mar. 22, 1887.

Fig. 1.

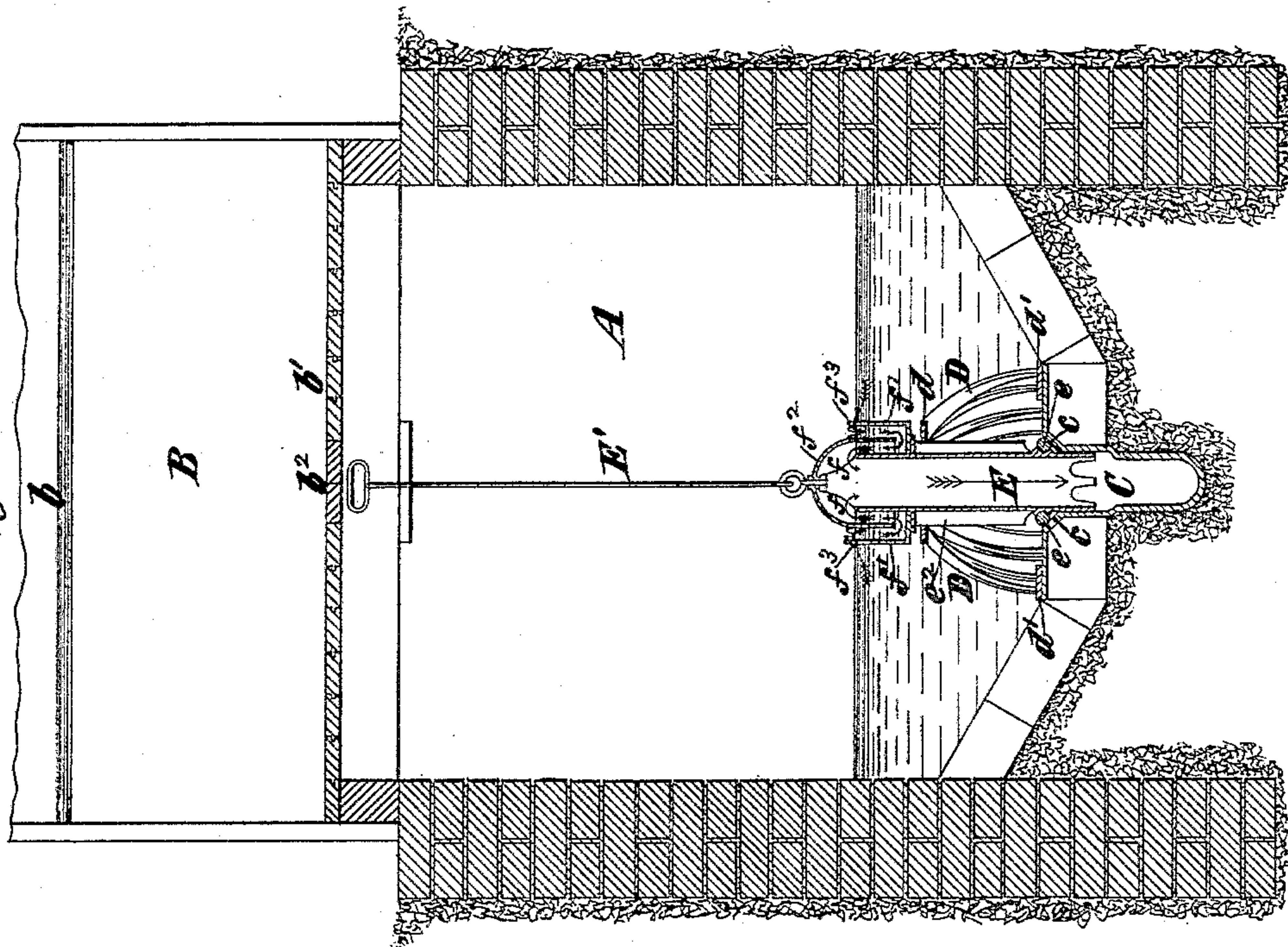
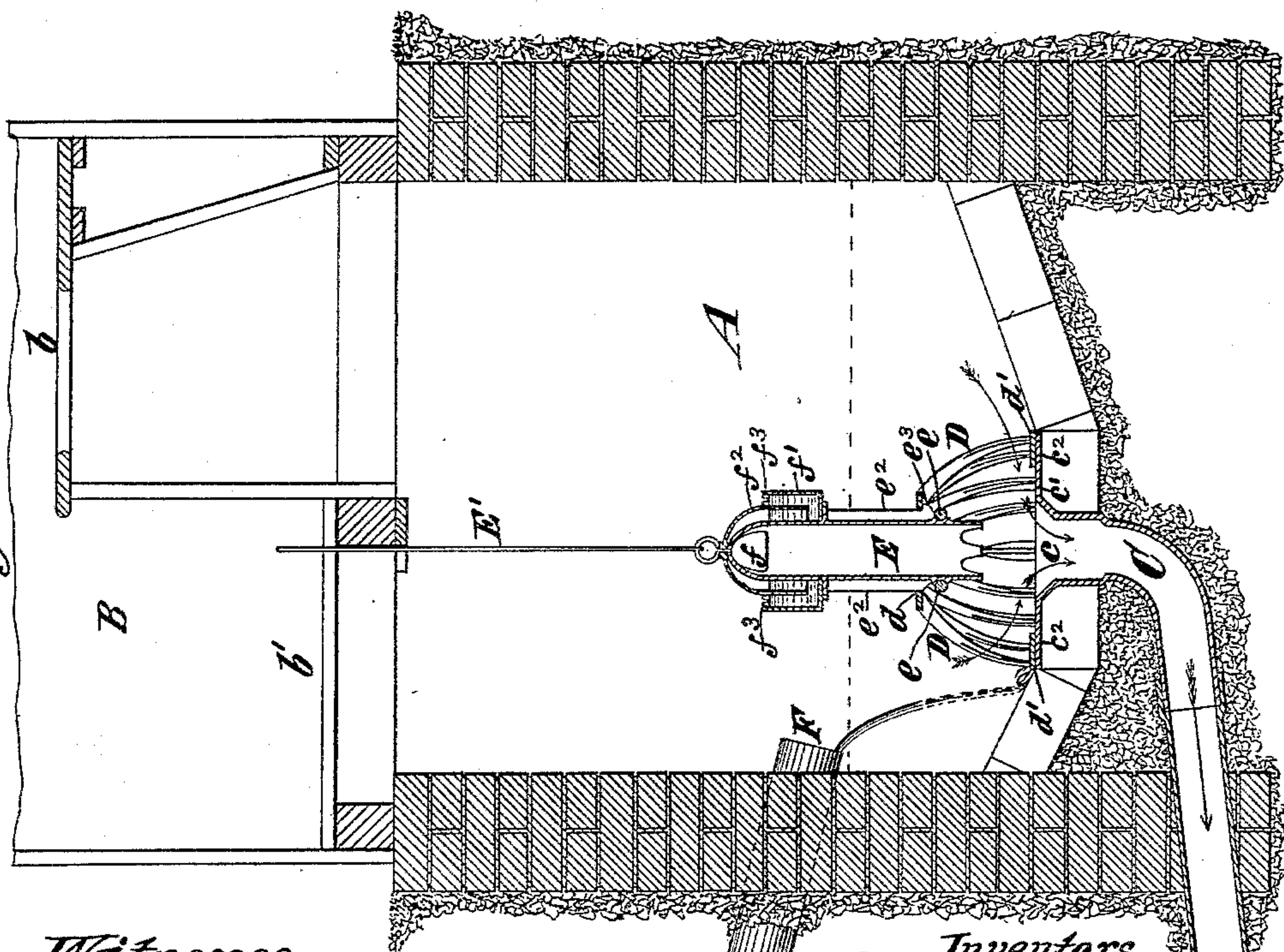


Fig. 2.



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(No Model.)

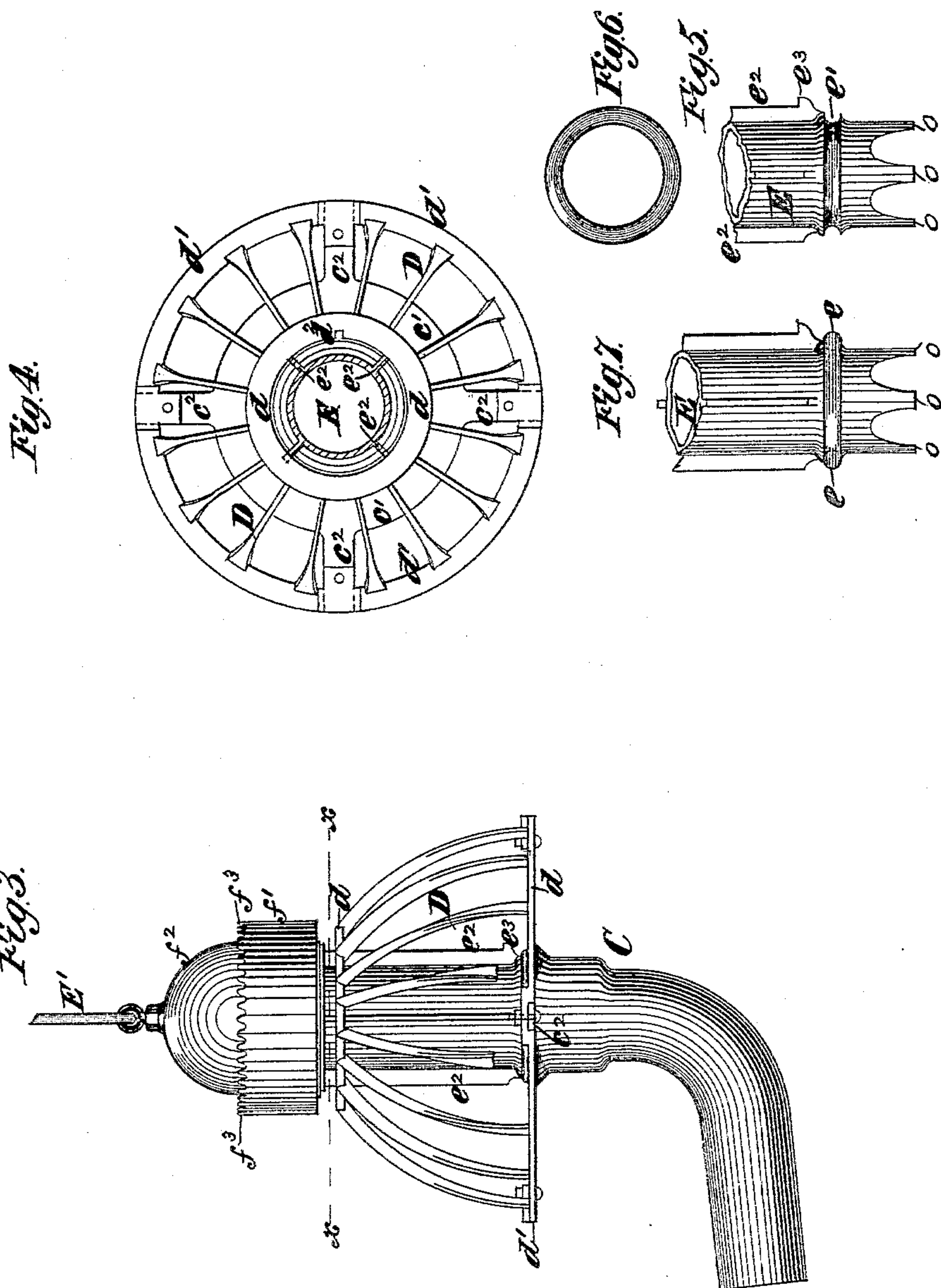
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UNITED STATES PATENT OFFICE.

VERNON ROYLE AND JOHN ROYLE, JR., OF PATERSON, NEW JERSEY.

WASTE AND FLUSHING VALVE FOR WATER-CLOSET VAULTS, &c.

SPECIFICATION forming part of Letters Patent No. 359,743, dated March 22, 1887.

Application filed July 26, 1886. Serial No. 209,146. (No model.)

To all whom it may concern:

Be it known that we, VERNON ROYLE and JOHN ROYLE, Jr., both of Paterson, in the county of Passaic and State of New Jersey, have invented a new and useful Improvement in Waste and Flushing Valves for Water-Closet Vaults and Cesspools, of which the following is a specification.

Our invention relates to valves which are employed for controlling the outlets from cesspools or privy-vaults, and which are so constructed as to provide an overflow for maintaining a desired level of water in the cesspool or vault, or for entirely emptying the same when desired.

In carrying out our invention we employ an outlet-pipe section provided with a valve-seat and a pipe having a surrounding valve-ring which closes upon the said seat, the said pipe being vertically movable, so as to provide for opening the valve when desired.

The invention consists in novel combinations of parts and details of construction, which are hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical section of a privy-vault having the invention applied thereto, the valve being closed and the overflow in operation. Fig. 2 is a corresponding section with the overflow-pipe raised so as to open the valve and empty the vault for flushing purposes. Fig. 3 is a side elevation of a complete apparatus which embodies our invention upon a larger scale. Fig. 4 is a horizontal section on the plane of the dotted line $x x$, Fig. 3. Figs. 5 and 6 are, respectively, an elevation of the lower portion of the overflow-pipe and a plan of the valve-ring which is to be applied thereto, and Fig. 7 is an elevation similar to Fig. 5 with the valve-ring in place.

Similar letters of reference designate corresponding parts in the several figures.

A designates the vault, and B the privy arranged above the same, and having a seat, b , and the floor b' . At the bottom of the vault is the outlet-pipe section C, having at its mouth a flaring or taper valve-seat, c , and above this outlet-pipe section is a cage, D, of open construction, comprising at the top a guide, d , which is concentric with the valve-seat c .

As best shown in Figs. 3 and 4, the mouth

of the pipe-section C has an outwardly-projecting flange, c' , provided with radial arms c^2 , and the cage D has a base ring or flange, d' , which is recessed on the under side to receive the arms c^2 , and is bolted to them. Within the guide d is a vertically-movable pipe, E, the lower end of which is of a size to enter freely into the outlet-pipe section C, and which is surrounded at a little distance above its lower end by a valve-ring, e .

The portion of the pipe E which projects below the valve-ring e enters the portion of the pipe-section C below the valve-seat, and is guided thereby to properly center the valve. The lower end of the pipe E may be notched upward, as shown best in Figs. 5 and 7, so as to form downward projections o , between which openings are afforded and which are unconnected at their lower extremities. When the pipe is thus constructed, an opening through the valve-seat c will be afforded without lifting the pipe entirely clear of the pipe-section C and without depriving the pipe of guidance at its lower end. In the case of a waste-valve for water-closet vaults it is desirable to have the pipe E formed with its downward projections o unconnected at their extremities, because there is less likelihood of paper or other solid substances getting between the circular exterior of the pipe E and the outlet-pipe section C than there would be if the pipe E was slotted near its lower end to form outlet-openings, or if, in other words, the downward projections o were connected by a circular ring-like portion at their lower extremities.

As best shown in Figs. 5 and 7, the pipe E is provided with a circumferential groove, e' , which is concave in a vertical direction, and within this groove the valve-ring e , of india-rubber or other elastic material, is held by its contractile elasticity. The pipe E has external vertical ribs, e^2 , which have greater projection from the pipe than the valve-ring e , and consequently the guide d , which is large enough in diameter to receive the ribs e^2 , permits the valve e to be moved upward with the pipe E directly through and above the guide. The valve-ring e is of course less in external diameter than the internal diameter of the guide d .

In order to provide for preventing the pipe E from being raised normally sufficient to

carry it above the guide d , one of the ribs e^2 may have an outwardly-extending stop-projection, e^3 , near its lower end, and the guide d may have a notch, d^2 , (shown in Fig. 4,) which receives this projection when the pipe E is turned so as to bring them coincident with each other. Consequently the pipe E, after being inserted downward through the guide d and turned slightly, is prevented from being raised above the guide until it is turned back to its position of insertion, which is not likely to be done accidentally. At the same time, however, the projection and notch d^2 e^3 provide for removing the valve and overflow-pipe E, when desired, without descending into the vault.

The pipe E has at the top, on one or each side, an overflow-opening, f , which is within the liquid seal or trap formed by an outer circular wall, f' , within which is an annular chamber or well open at the top and an inverted cup, f^2 , immersed in the water in said chamber or well, as shown in Figs. 1 and 2.

When the pipe E is in its lower position, closing the valve-ring upon the seat c , it will retain the level of water in the vault, as shown in Fig. 1, and provides for proper overflow of all water entering through the pipe E, without permitting any gas to ascend from the sewer.

It will be observed that below the trap or liquid seal at its top the pipe E affords a clear and unobstructed opening or passage downward, and affords no opportunity for the lodgment of any solid matter within it.

Whenever required to flush the sewer, the pipe E may be raised by means of a rod, E' , extending upward near to the floor of the privy and to which access may be had by a removable board or boards, b^2 , in the floor.

It will be obvious that if the outer wall, f' , of the liquid seal or trap had a true or plain upper edge, paper floating on the water in the vault would lap over this outer wall and be there retained. To avoid this, I make the upper edge of the wall f' serrated or with notches, as shown at f^3 , and the upward projections or points form stops to prevent the paper from passing over and lapping upon the inner side of the wall f' , as they provide an overflow just below the tops of the points or projections.

Although we prefer to employ an india-rubber valve-ring, e , which is retained on the pipe E simply by its contractile elasticity, the ring might be secured by screws or otherwise without depending upon its elasticity.

It will be observed that whenever the pipe E is raised the liquid seal at the top thereof retains its water, and hence when the pipe is lowered the gas-escape from the sewer is cut off as soon as the valve is closed and before the vault fills to an overflow-point.

It is advantageous to give the pipe E a clear passage through it as large as its diameter at the upper end, because then there is no danger of its clogging.

It is advantageous to make the guide d larger in diameter than the exterior diameter

of the pipe E and to provide for the guidance of the pipe by its projecting ribs e^2 , because then the ring-valve may be so arranged on the pipe as to shield it within the circumference of the outer edges of the ribs and to provide for the entire withdrawal of the pipe with the valve upon it through the guide without any contraction of the internal diameter of the pipe to form a seat for the ring upon the pipe. When the pipe E has a guide, as d , the pipe may be entirely withdrawn from the outlet to afford an unobstructed rush of water from the vault, and the downward projections at the lower end of the pipe provide for forming an outlet without entirely raising the pipe from the valve-seat and at the same time without leaving any complete circular portion of the pipe within the valve-seat.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination, with an outlet-pipe section for a vault or cesspool, provided at the mouth with a valve-seat and surrounded by a cage or strainer having openings in its sides of such size as to prevent the entrance of such solid matter which would choke the outlet, and having a guide at the top, of a pipe vertically movable in said guide to open and close the outlet, provided with a surrounding valve fitting the valve-seat and projecting below said valve to be guided in the outlet-pipe section, and a stop for limiting the upward movement of said pipe, and which will permit its entire withdrawal from the outlet-pipe section, substantially as herein described.

2. The combination, with the outlet-pipe section provided at the mouth with a valve-seat, and a cage surrounding the outlet and provided opposite the valve-seat with a guide, of the pipe E, vertically movable in said guide and provided with an overflow-opening at the top and having its diameter throughout as large as its diameter at the top, and also provided with ribs e^2 , the outer edges of which make contact with the guide to guide the pipe, said guide being larger than the exterior diameter of the pipe, and a valve-ring, e , surrounding the pipe below said ribs and which is shielded by the projection of the ribs and is less in external diameter than the internal diameter of the guide, so that the pipe with the valve-ring in place may be withdrawn upward through the guide, substantially as herein described.

3. The combination, with the outlet-pipe section C, having a valve-seat, c , of the surrounding cage having at the top the guide d , notched at d^2 , the overflow-pipe E, having external ribs e^2 , the outer edges of which make contact with the guide d , and one of which is formed with the stop-projection e^3 , which projects outward beyond the wall of the guide d , and which is movable through the notch d^2 when the pipe is turned to proper position to enable the pipe to be wholly removed from the guide, and the valve-ring e , surrounding said pipe, and which is shielded within the outer edges of the ribs

e^2 , and is less in external diameter than the internal diameter of the guide d , substantially as herein described.

4. The combination, with the outlet-pipe section provided at the mouth with a valve-seat, of a vertically-movable pipe having near the lower end a surrounding valve, and provided at the top with a liquid seal or trap affording an overflow through it, and composed of an annular water-chamber or well and an inverted cup immersed therein, the outer wall, f' , of said chamber or well having its upper edge serrated or provided with projections f^3 , standing above the level of the overflow, for preventing the entrance into the trap of paper floating on the water, substantially as herein described.

5. The combination, with an outlet-pipe sec-

tion, C, constructed with a valve-seat, e , and radial horizontally-extending arms c^2 , of the cage or strainer D, having a lower ring, d' , whereby it is secured at the base to said arms c^2 , and forming at the top the guide d , the pipe E, provided with a surrounding valve-ring closing upon the seat and movable vertically in the guide d , and having its diameter as large throughout as at the upper end, and a stop limiting the upward movement of the pipe, but permitting its entire withdrawal from the outlet-pipe section, substantially as herein described.

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