

(No Model.)

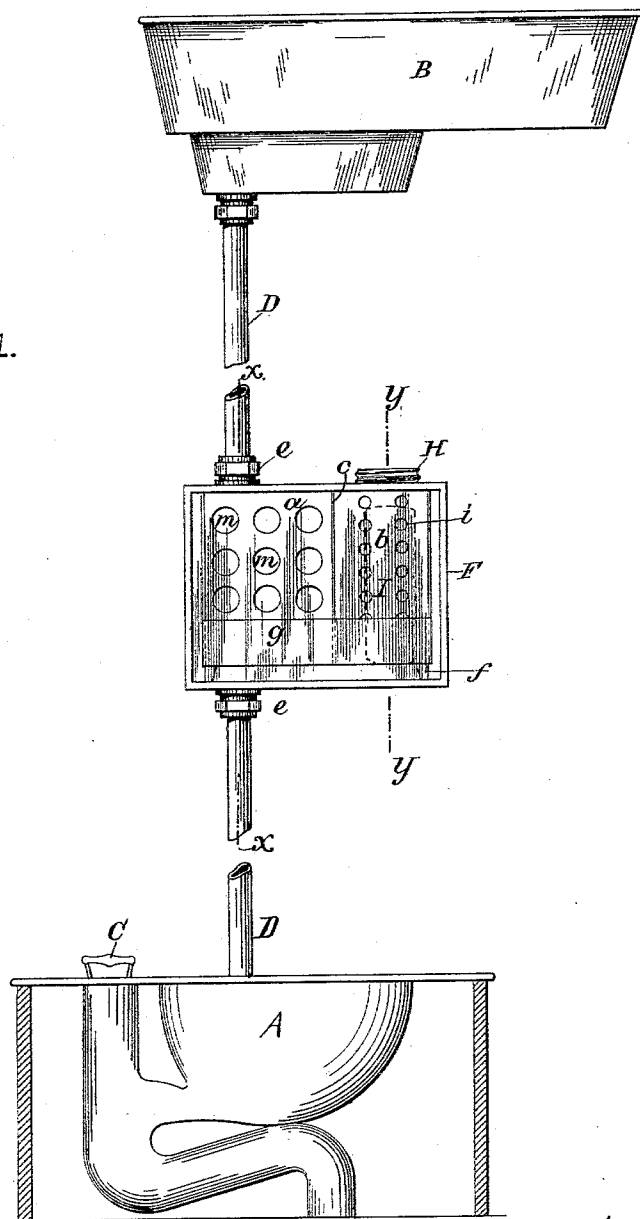
2 Sheets—Sheet 1.

W. M. ERNST.
DISINFECTING WATER CLOSETS.

No. 331,693.

Patented Dec. 1, 1885.

Fig. 1.



ATTEST:

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Jacob Felbel.

INVENTOR:

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J. M. Intire

(No Model.)

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Fig. 2.

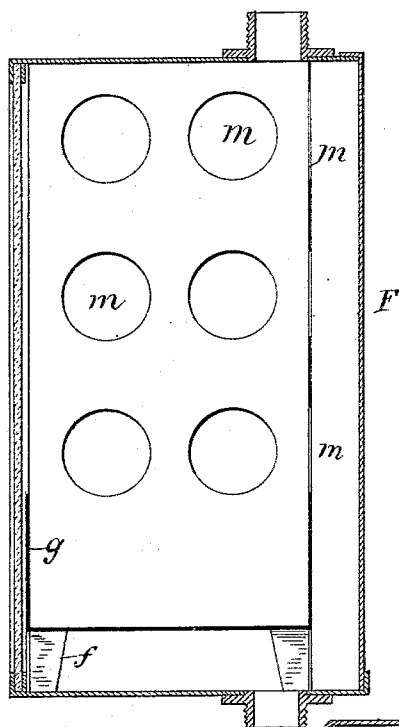


Fig. 3.

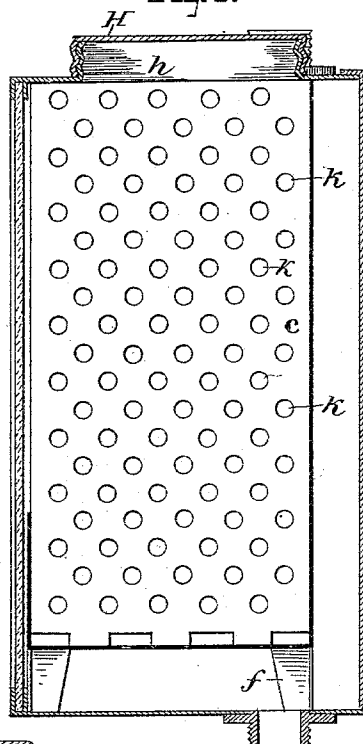
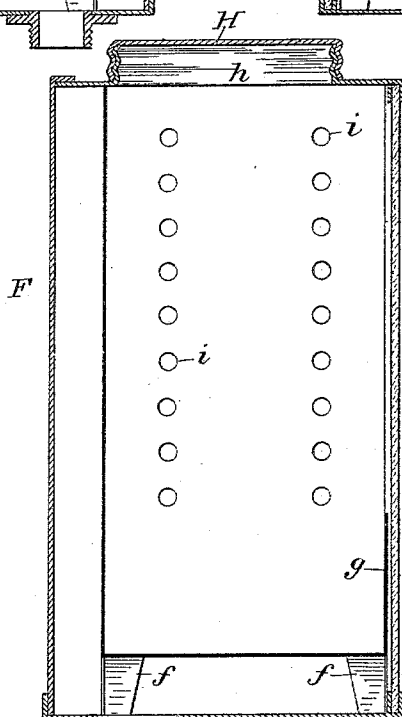


Fig. 4.



ATTEST:

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UNITED STATES PATENT OFFICE.

WILLIAM M. ERNST, OF NEW YORK, N. Y.

DISINFECTING WATER-CLOSETS.

SPECIFICATION forming part of Letters Patent No. 331,693, dated December 1, 1885.

Application filed May 29, 1885. Serial No. 167,034. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. ERNST, of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Disinfecting Water-Closets; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this application.

Previous to my invention various methods of and means for disinfecting water-closets, urinals, &c., have been devised and employed, among which may be found some methods and contrivances in which the water supplied to the closet is impregnated or saturated with the disinfectant before the water enters the bowl of the closet, some suitable disinfecting material being arranged in a receptacle of some sort intermediate of the closet and the source of water-supply in such manner that the supply of water has to come in contact with the disinfectant on its way to the bowl of the closet.

My invention relates to this type of means for disinfecting water-closets, urinals, &c.; and it consists in certain new and useful improvements therein, which will be hereinafter more fully explained, and which will be found more particularly pointed out and defined in the claims of this specification.

To enable those skilled in the art to which my invention relates to make and use the same, I will now proceed to more fully describe it, referring by letters of reference to the accompanying drawings, which form a part of this specification, and in which I have shown my invention carried out in that form in which I have so far successfully practiced it, and which is the best now known to me.

In the drawings, Figure 1 is an elevation illustrating so much of a water-closet apparatus as is necessary to show the practical application of my invention. Fig. 2 is a vertical cross-section at the line *xx* of Fig. 1, showing on an enlarged scale the construction of the disinfecting chamber or receptacle. Fig. 3 is a vertical cross-section of said disinfecting chamber or receptacle, drawn on the same scale as Fig. 2, and taken at the line *yy* of Fig. 1. Fig. 4 is a cross-section at the same

place as that at which Fig. 3 is taken, but looking in the opposite direction.

At Fig. 1 I have illustrated the supply-pipe as being broken away at two points and the tank and box both lowered for the purpose, merely, of compactness in the drawings.

In the several figures the same part will be found designated by the same letter of reference.

A illustrates so much of the water-closet of any approved construction as it is necessary to show for the purpose of illustrating the practical application of my invention, and B represents the water-supply tank of any of the usual and approved forms.

D represents the supply-pipe, through which the usual quantity of water is supplied from the tank B to the flushing-rim of the bowl of the water-closet whenever the pull-up handle C may be operated in the usual manner for the purpose of supplying the water to flush out the bowl and replenish the water-seal therein.

The supply-pipe D, instead of extending continuously from the tank or other source of water-supply to the inlet-pipe or nozzle of the water-closet bowl, is made in two sections, as clearly shown, the upper one of which at its lowermost end and the lower one of which at its uppermost end are connected, as shown, by suitable couplings, *e*, and so as to communicate with its interior with a metallic or other box, chamber, or receptacle, F, of any suitable size and shape, (but preferably of the form shown,) that is located at any convenient point intermediate of the water-closet bowl and the tank B or other source of water-supply. This box or chamber F may, if desired, be made with one of its sides composed of glass, so that a view of its interior construction and devices may be obtained, and I have illustrated it as thus made with a glass front. Within said chamber or box F is placed or formed a supplemental chamber or device, which, in the form shown, is composed of two compartments, *a* and *b*, separated from each other by a perforated partition, *c*, and each having at the back and side portions perforations, for purposes to be presently explained. This supplemental interiorly-arranged duplex chamber has its bottom, as shown, placed a

short distance above the main chamber F, said bottom being supported, preferably, by plate-like devices *f*, and the front portions of the compartments of said duplex chamber are closed up to a certain height (for a purpose to be presently explained) by the solid front portion, (marked *g*.) In the top of the main chamber or box F, at a locality immediately over the compartment *b* at the supplemental chamber, is an opening or nozzle, the upwardly-projecting flange *h* of which is threaded and provided with a screw cap or cover, H, the purpose of said opening, with its screw-cap, being to afford a ready means of access to the compartment *b*, for a purpose to be presently explained.

The perforations *i* in the back and end portions of the compartments *b* may be more or less in number, but should not extend down lower than the level of the top of the solid frontside or portion, *g*, of the duplex chamber, and they should be of such comparatively small size as to prevent the liability of a passage through them of any particles of the disinfecting material large enough to possibly clog or interfere with the perfect working of the water-ways of either the disinfecting contrivance or the flushing-rim of the water-closet bowl.

The perforations *k* of the partition *c* of the duplex chamber extend clear down to the bottom of said partition, but preferably do not extend all the way up to the top thereof, while the holes or apertures *m* in the back and end portions of the compartment *a* are made, as shown, comparatively very large, so as to permit a free egress of the water from said compartment, in the manner and for the purpose to be presently explained, and, like the perforations in the back and end portions of the compartment *b*, these apertures *m* are all arranged above the level of the top edge of the solid and front piece, *g*, of the duplex chamber. As fully shown, this duplex chamber is arranged within the main box or chamber F so as to have not only a space left, as already explained, between its bottom and the bottom of the main box F, but so as to have left also sufficient water ways or spaces between both of its ends and the ends of the box F and between its back portion or side and the back of said box F, so that the water which may be supplied through the upper portion of the supply-pipe D to the interior of the compartment *a* of the supplemental chamber may, on escaping from said supplemental duplex chamber, fill or partially fill the water-spaces at the ends and back of said supplemental chamber, and from thence freely escape from the main box F through the lowermost section of the supply-pipe D, passing thence through the flushing-rim of the water-closet to flush the bowl in the usual and well-known manner.

The disinfecting material or ingredients are placed within the compartment *b* of the supplemental chamber, and may be used in any form and composed of any substances which

may be most desirable for the purposes of charging the water to be supplied to the closet with the necessary disinfecting and deodorizing qualities.

I have shown the material in that form in which I prefer to use it, and with which I have so far very successfully operated my disinfecting contrivance—viz., in the form of a solid cake or mass adapted to be washed away by the action thereon of the water, the ingredients composing the mass or cake, such as shown at 1, consisting of equal parts of copperas, nitrate of lead, salt, and sulphate of zinc.

In the practical working or operation of a contrivance such as shown in the drawings and hereinbefore described as to its construction the supply of water from the tank B or other source, descending through the upper section of the supply-pipe D, is discharged into the compartment *a* of the supplemental or duplex chamber, striking upon the solid bottom of said compartment, and nearly or quite filling it, at the same time rushing thence, not only through the perforated partition *c* into the compartment *b*, containing the disinfecting material, but also through the apertures *m* of the compartment *a*, and through the perforations *c* of the compartment *b* into the water-spaces between the supplemental chamber and the main box F, from which latter the water then escapes, thoroughly impregnated with the disinfectant, through the lower section of the supply-pipe D to the bowl of the closet, a quantity of the water-supply, however, remaining in both compartments *a* and *b* of the interior or supplemental chamber up to a level about coincident with the top edge of the solid front portion, *g*, and the lowermost portions of the perforations *m* and *c* of the two compartments. Of course, after the first use of the contrivance, the supply of water entering from the supply-pipe into the compartment *a* will strike always on top of the standing water in said compartment, and whenever the water thus enters said compartment not only the mass of water entering but also that which was standing in both the compartments *a* and *b* is thrown into a state of agitation or ebullition, the operation and effect of which is not only to stir up and completely commingle with the fresh supply of water the standing water which had previously become saturated with the disinfectant, but also to swash the water thus commixed together through the partition *c*, and into forcible and thorough contact with the mass of disinfecting material contained in the compartment *b*. Thus it will be seen that not only is the water which rushes into the compartment *a* from the source of supply caused to pass into and through the compartment *b* under a state of agitation, so as to wash off, so to speak, or carry along with it a material portion of the disinfecting ingredients, but said water is also thoroughly commingled with that which had been standing in both com-

partments and which had become saturated with the disinfectant, this admixture of waters rushing out through all the avenues of escape from the duplex interiorly-arranged chamber into the water-spaces of the main box F, and thence into the water-closet bowl.

The apertures *m* in the compartment *a* should be so large as to permit the escape of the water with such a degree of freedom as that the head or supply will not be very materially affected by the partial stoppage of the water as it descends from the tank B through the disinfecting-contrivance on its way to the water-closet bowl, while the perforations *i* in the back and side of the compartment *b*, as well as those in the partition between the two compartments, should be so small as to avoid the possibility of the escape of any particles of disinfectant (especially where the latter is used in the form of lumps or loose particles placed in the compartment *b*) large enough to injuriously affect any of the water ways or passages of the flushing-rim or other devices of the water-closet bowl.

The extent to which the partition between the two compartments *a* and *b* should be perforated will depend somewhat on the character and condition of the disinfectant employed and other circumstances. I prefer to have it under all ordinary conditions where a disinfectant such as I have shown and described is used perforated only part way up, so as not to wash off at each use of the closet an unnecessarily-large quantity of the disinfectant.

It will be seen that in the use of a contrivance made and constructed on the principle shown and described and operated according to my invention the water supplied from the supply-tank at each using of the closet will carry along with it a sufficient quantity of the disinfecting and deodorizing ingredients from the chamber *b* and from the water which has been standing in the lower portions of both of the chambers to produce a perfect cleansing of the water-closet bowl and the connections and pipes extending therefrom, and the water left in the bowl after the performance of the flushing operation will be charged with the disinfecting substances, so as to keep the closet and its surroundings always in a purified and healthful condition.

The sizes and proportions as well as the shapes of the parts of the contrivance shown may of course be varied more or less without departing from the principle of my invention, and any suitable materials of construction of course may be employed in carrying my said invention into operation, the essential features of novelty consisting in, first, having the disinfecting material located within one compartment and the supply of water allowed to rush into an adjoining compartment, there being a means of communication for the water to pass from one compartment to the other, and means for the escape of the water from both compartments into the surrounding receptacle, and thence to the bowl of the closet,

so that while the passage of the water is not so obstructed as to destroy the head of the water-supply no portions of the disinfecting material large enough to do any harm can escape from that compartment in which the disinfectant is placed; second, providing means for the retention of a suitable quantity of water always within the compartments *a* and *b*, in order that there shall always be a supply on hand (in the disinfecting contrivance) of water already impregnated with the ingredients contained in the compartment *b*, with which supply the incoming supply of fresh water is thoroughly mixed before its descent to the water-closet bowl; third, any means by which the supply of water on entering the box F will be thrown into a state of agitation, and will also agitate the standing water in the compartments *a* and *b*, so as to effect not only an impregnation of the freshly-supplied water with the disinfecting material in the compartment *b*, but also a thorough admixture of said supply with the standing water in both the compartments *a* and *b*.

Having now so fully explained the construction and operation of my improved means for disinfecting water-closets as to enable those skilled in the art to make and use my invention, either in the form I have shown it carried out or in some other suitable form, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a water-closet bowl or urinal and the pipe for supplying water thereto, (from the usual tank or other source of supply,) of a chamber or box placed at any convenient locality between the closet or urinal and the source of water-supply, which is so connected with the said supply-pipe that the flushing-water must pass through it, and which is made or provided with devices forming two interiorly-arranged compartments communicating with each other, one of which compartments is adapted to retain some suitable solid disinfectant, and the other of which compartments communicates with the water-supply pipe, the combination being such, as shown and described, that the water entering one of said compartments will be thrown into a state of agitation therein, and passing partially into the other of said compartments will become impregnated or charged with the solid disinfectant contained in the latter, as and for the purposes hereinbefore set forth.

2. The combination, with a water-closet bowl or urinal and the pipe for supplying the water thereto, of a chamber or box located intermediately of the water-closet and the source of supply, and through which the flushing-water passes, and a separate disinfectant-receptacle arranged interiorly of the said chamber or box and constructed, as described, to retain always along with the solid disinfectant a given quantity of water, in order that at each flushing operation the supply of fresh water shall not only be thrown into contact with the solid disinfectant, but shall also

be commingled with and carry off with it a portion of the impregnated standing water of the disinfectant-receptacle, all as hereinbefore set forth.

- 5 3. The combination, with a water-closet bowl or urinal, the chamber or box F, a water-supply pipe entering the upper part of said box, and a pipe leading from the bottom thereof to the closet-bowl, of an interiorly-arranged
10 disinfectant-chamber, onto the bottom of one of the compartments of which the stream of water supplied to the box F is directly dis-

charged for the purpose of causing the supply of water to be thrown into a state of agitation, and thus better insure a thorough im- 15
pregnation of it with the solid disinfectant contained in the other of said compartments, all as hereinbefore set forth.

In witness whereof I have hereunto set my hand this 22d day of May, 1885.

WILLIAM M. ERNST.

In presence of—

JACOB FELBEL,
F. H. JONES.