(No Model.)

J. W. STEVENS.

WATER CLOSET FLUSHING VALVE.

No. 407,746. Patented July 23, 1889.

Fig. 1

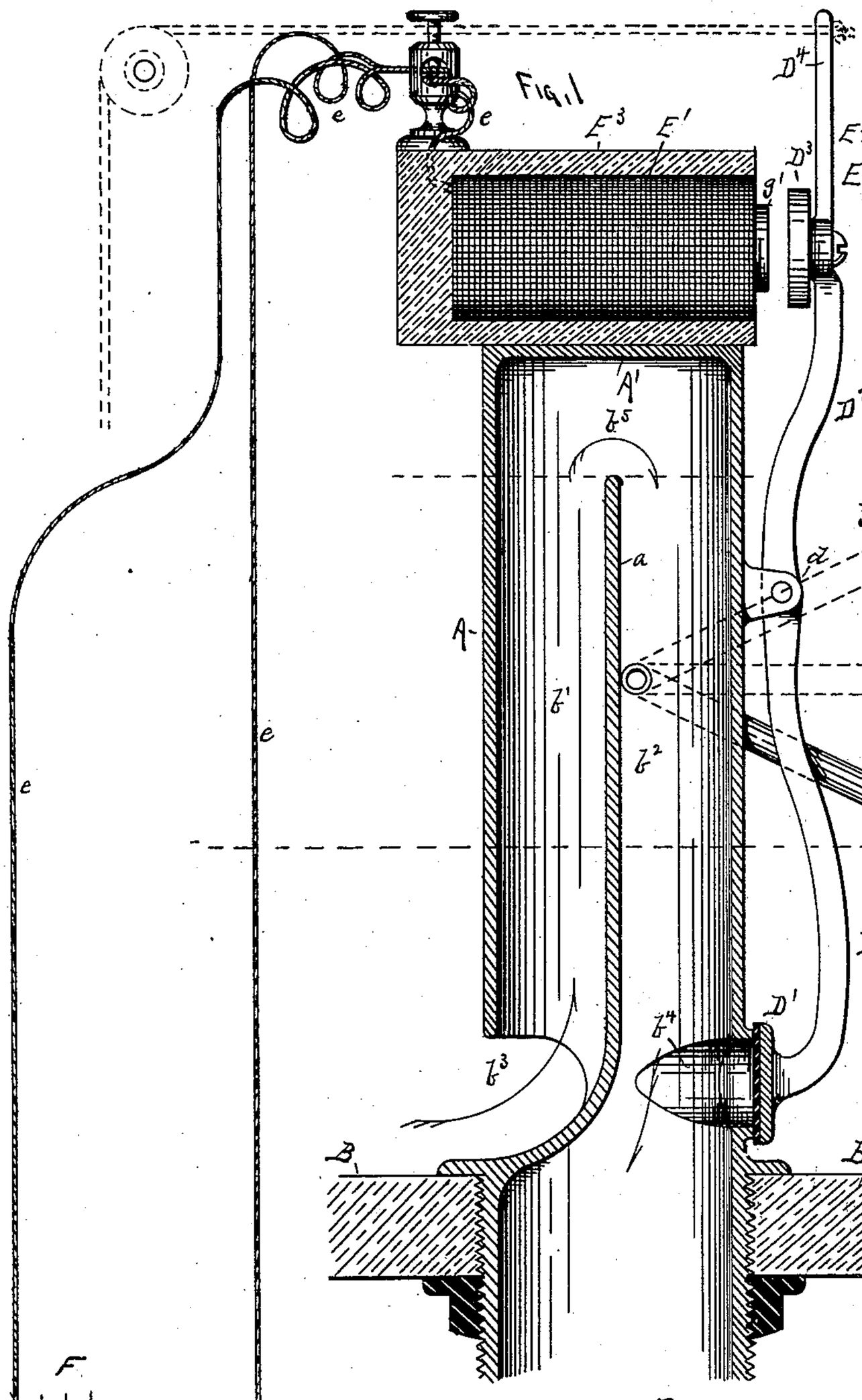


Fig. 3

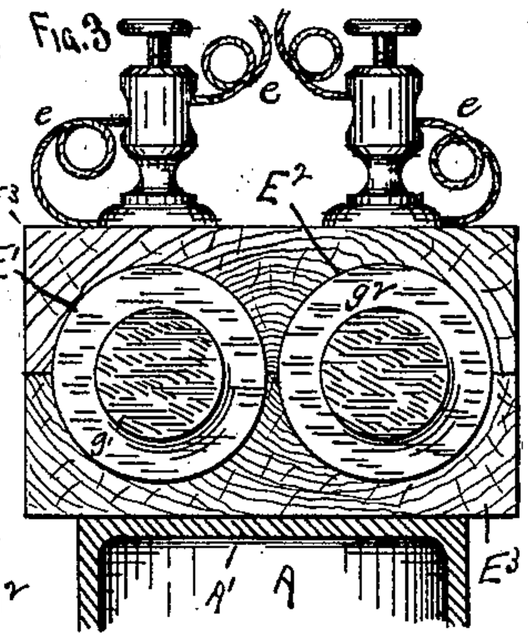
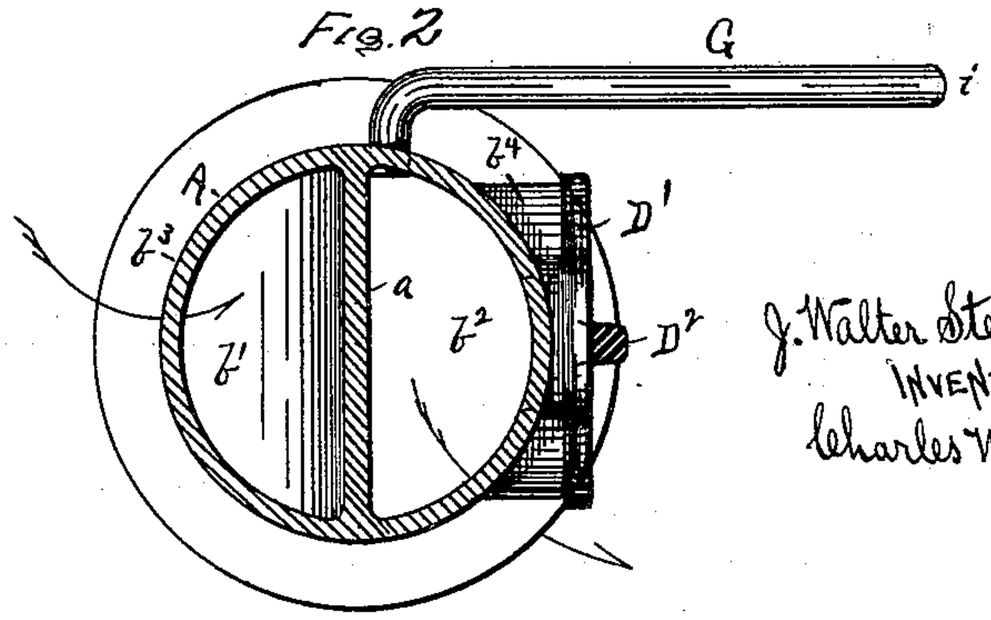


Fig. 2



WITNESSES.
H. S. Webster
Stiles W Burr

J. Walter Stevens,
INVENTOR, BY
Charles N. Woodward
Atty.

UNITED STATES PATENT OFFICE.

JOHN WALTER STEVENS, OF ST. PAUL, MINNESOTA.

WATER-CLOSET FLUSHING-VALVE.

SPECIFICATION forming part of Letters Patent No. 407,746, dated July 23, 1889.

Application filed September 7, 1888. Serial No. 284,779. (No model.)

To all whom it may concern:

Be it known that I, JOHN WALTER STEVENS, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Water-Closet Flushing-Valves, of which the following is a specification.

This invention relates to flushing-valves of water-closet tanks; and it consists in the construction and mode of operation whereby the valve is simplified and more easily operated and its liability of disarrangement lessened, as hereinafter shown and described, and specifically pointed out in the claims.

In the drawings, Figure 1 is a sectional elevation of one of the valves complete and set in a tank. Fig. 2 is a cross-sectional view in the line X X of Fig. 1. Fig. 3 is a front elevation of the upper portion of the valve-casing, showing the electro-magnet coils in position thereon.

A represents the shell or casing of the valve, which will be rigidly secured in the bottom B of the tank, so as to discharge through it, as shown. The valve-casing is provided with a cross-partition *a*, dividing it into two compartments b' b^2, the compartment b' opening into the tank at its bottom by a port b^3, and the compartment b^2 opening down into the discharge-pipe through the bottom B of the tank, and also provided with a port b^4 opening out into the interior of the tank. The top A′ of the casing is closed, leaving a space b^5 between it and the top of the partition *a*, so that the contents of the compartment b' may freely flow over in the compartment b^2. The port b^4 is covered by a valve D′, the latter adapted to be actuated by a doubly-curved lever D^2, pivoted at *d* to the side of the casing A.

Upon the upper side of the casing A are secured two "helixes" or coils E′ E^2, connected by wires *e* to an electrical battery F, with the positive ends g' g^2 of its "poles" in electrical proximity to an armature D^3 on the upper end of the lever D^2. This lever is so pivoted that about two-thirds ($\frac{2}{3}$) of its length is below its pivot *d*, and one-third ($\frac{1}{3}$) above its pivot, so that the throw of the lower part of the lever will be twice as much as the movement of the upper part to secure the required degree of opening of the valve D′. The lever D^2 is curved outward both above and below the pivot *d*, so that the center of gravity will fall outside the line of the pivot, thus causing the weight of the lever to be exerted upon the valve to close it, and thus avoid the necessity for a spring, although a spring may be employed, if required, to close the valve when the lever is released. The helixes E′ E^2 may be arranged and attached in any desired manner; but for the purpose of illustration I have shown them inclosed in a wooden casing E^3, which will be in turn secured to the casing A, as shown. This is a very simple and effective method of arranging and securing the helixes; but I do not wish to be limited to any particular form of construction. The wires *e*, connecting the helixes and the battery F, may be carried to any convenient point near the seat of the closet and connected to a push-button *e′* of the ordinary construction, the pushing down of the button closing the circuit and drawing the armature into contact with the magnet in the coils, and thus opening the valve D′ and permitting the water in the tank to escape so long as the valve is kept open by keeping the current of electricity unbroken. The moment the button is released, however, the current will be broken, and gravity of the lever, assisted by the pressure of the water in the tank, will close the valve; but in the meantime the flowing of the water has released the air-pressure in the casing A above the water therein, so that a partial vacuum is formed, which causes the water to rise in the compartment b' and flow over in the compartment b^2, thus creating a "siphon," so that when the valve D′ is closed the water will continue to flow through the casing until the water in the tank falls, so as to admit air through the port b^3, thus destroying the siphon principle and stopping the outflow from the tank. The inflowing water will then rise in the tank to the level of the top of the partition *a*, where it will remain, the compartment b^2 thereafter serving as an "overflow."

The port b^3 being a fixture, the amount of water flowing from the tank will always be the quantity above the level of this port; but

it frequently happens that a less amount is required to "flush" the closet; and to accomplish this I connect into the compartment b^2 a tube G, adapted to be adjusted to elevate or depress its open end i to the required height.

In Fig. 1 the tube G is shown depressed, the highest possible water-line being represented by the dotted line Y Y, as if the water falls below that point the air would flow in and destroy the siphon principle in the casing in precisely the same manner as when the water falls below the port b^3. Then if the tube G is turned up to a horizontal line, as indicated by dotted line Z Z, the water will not rise above that point, and so on, the point of elevation of the open outer end i of the tube G determining the height to which the water will rise in the tank. By this simple device the amount of the water which will flow through the flushing-pipe may be perfectly and easily gaged by adjusting the tube G.

The lever D^2 will be formed with an extended upper end D^4, to which a cord or chain may be attached, so that the valve-rod may be operated by pulling down the cord in event of the failure of the battery or any of its connections.

One important advantage which I claim by this construction is the compact arrangement of the parts, with the lever D^2 and its valve D', and armature D^3, and the helixes or coils E' E^2, all securely connected to the casing A, and the latter firmly secured to the tank B, so that the parts will not become disarranged or out of adjustment. This is a very important consideration where electrical apparatus is employed, as a very slight degree of disarrangement will destroy its utility.

Having thus described my invention, what I claim as new is—

1. A water-closet flush-tank valve consisting of a casing A, having division a and inlet-ports b^3 b^4, an electro-magnet attached to said casing, and a valve-lever D^2, having valve D', adapted to close said port b^4, and an armature D^3, adapted to be actuated by said electro-magnet when the circuit therein is broken or closed to correspondingly open and close said valve, substantially as and for the purpose set forth.

2. A water-closet flush-tank valve consisting of a casing A, having division a and inlet-ports b^3 b^4, a valve D', adapted to open and close said port b^4, and an adjustable tube G, connected into said casing, whereby the height of water in the tank may be regulated, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

J. WALTER STEVENS.

Witnesses:
O. D. WHEELER,
EVA POPE.