(No Model.) 2 Sheets—Sheet 1.

P. J. MADDEN.

FLUSHING ATTACHMENT FOR WATER CLOSETS.

No. 569,341. Patented Oct. 13, 1896.

Fig. 2.

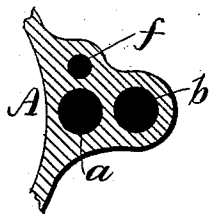


Fig. 1.

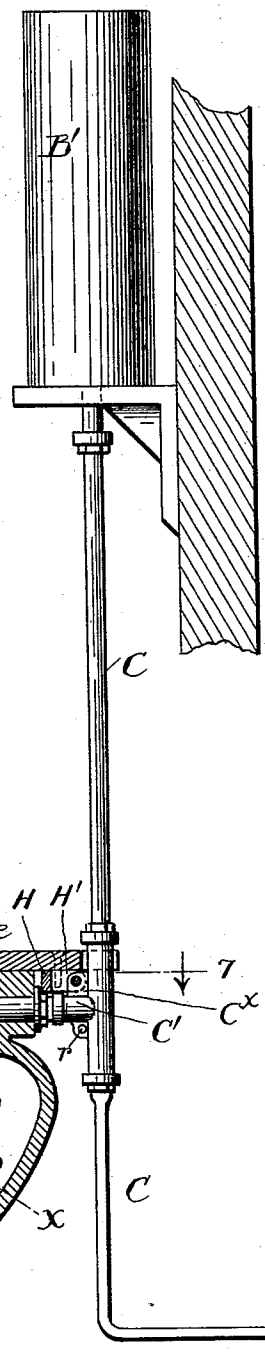
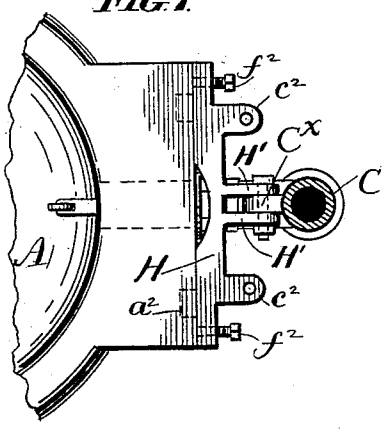


Fig. 7.



Witnesses:
J Halpenny
S. E. Sharon

Inventor:
Patrick J. Madden
By his attorneys
Gridley & Hopkins

(No Model.) 2 Sheets—Sheet 2.

P. J. MADDEN.

FLUSHING ATTACHMENT FOR WATER CLOSETS.

No. 569,341. Patented Oct. 13, 1896.

Fig. 3.

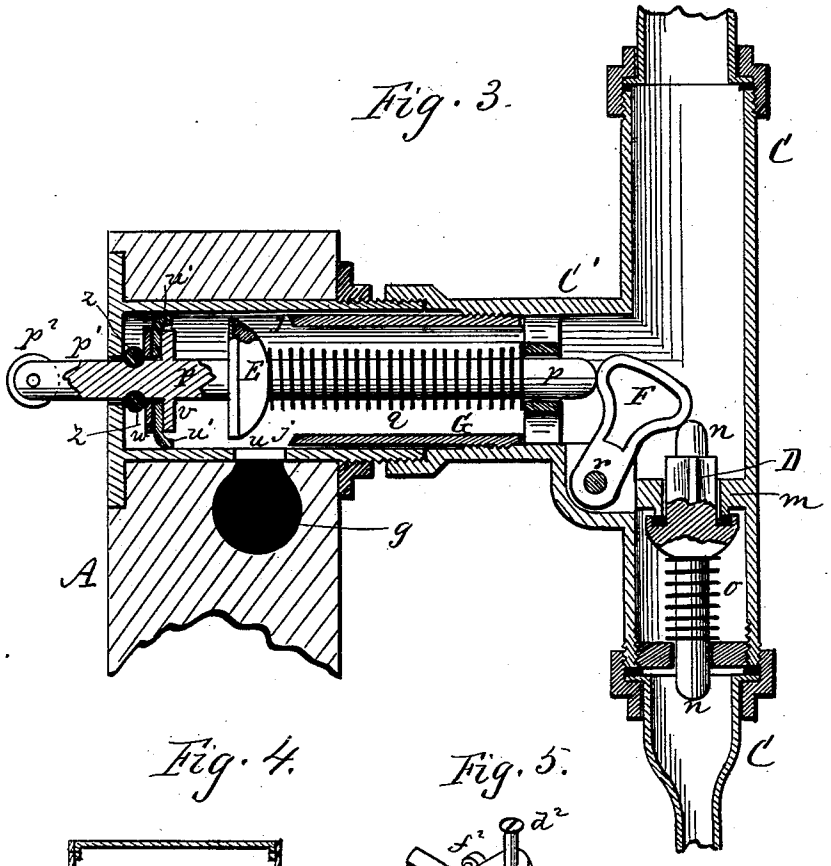


Fig. 4.

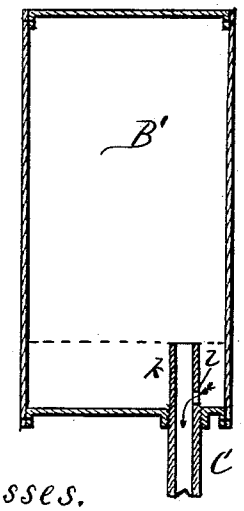


Fig. 5.

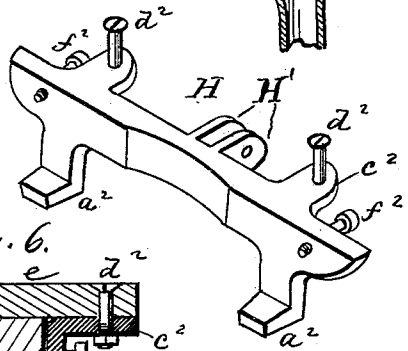
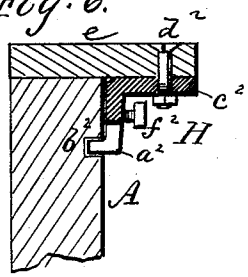


Fig. 6.



Witnesses.
Chas. E. Sidener.
D. W. Beach

Inventor.
Patrick J. Madden,
by R. F. Osgood,
Atty.

UNITED STATES PATENT OFFICE.

PATRICK J. MADDEN, OF ROCHESTER, NEW YORK.

FLUSHING ATTACHMENT FOR WATER-CLOSETS.

SPECIFICATION forming part of Letters Patent No. 569,341, dated October 13, 1896.

Application filed June 23, 1890. Serial No. 356,410. (No model.)

To all whom it may concern:

Be it known that I, PATRICK J. MADDEN, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Water-Closets, of which the following is a specification, reference being had to the accompanying drawings, which are made a part hereof, and in which—

Figure 1 is a sectional elevation of a water-closet embodying the invention. Fig. 2 is a section of a portion of the bowl on a larger scale, the cutting plane being indicated by the line *x x*, Fig. 1. Fig. 3 is a sectional elevation of the valve mechanism and the adjacent parts on a larger scale, the section being taken in a vertical plane cutting the water-supply pipes. Fig. 4 is a vertical section of the flushing-tank. Fig. 5 is a perspective view of the bracket to which the seat-rail is attached. Fig. 6 is a fragmentary view showing in section the bracket shown in Fig. 5, the seat-rail attached thereto, and a portion of the bowl. Fig. 7 is a plan view of said bracket and a horizontal section of the water-pipe to which it is secured.

The present invention relates more particularly to that class of water-closets in which water is first admitted to an "air-tight" flushing-tank (by which is meant a tank of such construction that air is compressed in it by the water that enters it) and afterward discharged therefrom into the bowl, but I desire to have it understood that some features of said invention are applicable to closets in which the flushing-tank is not air-tight. Hence I reserve to myself the exclusive right to use the several novel combinations in which my invention consists as the same are severally set forth in the claims hereinafter.

A indicates the bowl, and B the seat, the latter in its normal position standing somewhat elevated, as shown in Fig. 1. The bowl is constructed with two curved water-passages *a b*, rising to a height equal to the level at which the water stands in the bowl, one communicating with the interior of the bowl, as shown at *c*, and the other with the discharge, as shown at *d*. It is also constructed with a side jet-passage *f*, (indicated by dotted lines in Fig. 1,) the upper end communicating with the inlet-pipe of the bowl, as shown at *g*, and the lower end opening into the bottom of passage *a*, as shown at *h*. When the water enters the bowl, a portion passes through the usual side passage *t* under the rim and discharges through the perforations *i i*, leading therefrom into the bowl, and a portion passes down the jet-tube *f*, and by its force drives the water in the bowl up through passage *a* and causes it to discharge through passage *b*. Its effect is to force the water out of the bowl and drive it over into the outlet.

B′ is the flushing-tank, located above the bowl, and C is a pipe connected therewith and having a lateral branch C′ leading to the bowl. The upper end of pipe C is screwed into the bottom of the tank and projects upward some distance therefrom, as shown at *k*, Fig. 4, and is provided with an orifice *l* close to the bottom of the tank, the object of which will be presently described.

D is a valve in the pipe C, which shuts up against a seat *m* to cut off the supply to the tank. It is attached to a stem *n* and is pressed up to close the valve by a spring *o*.

E is a valve in the branch pipe C′, which shuts back against a seat *j* to cut off the supply of water from the tank to the bowl. It is attached to a valve-stem *p* and is pressed forward to open the valve by a stiff spring *q*. F is a rocker consisting of a segment pivoted at *r* so as to swing forward and back, one side resting against stem *p* and the other against stem *n*. The stem *p* has a projection *p′*, which rests inside the bowl and is provided with a friction-roller p^2 at its end. The seat B has a bearing *s* on its under side, which rests against this roller.

In the normal position of the parts and when no weight rests upon the seat the spring *o* closes the valve D and shuts off the supply of water to the tank. The spring *q* holds the valve E normally unseated and also holds the seat normally in a partially-elevated position.

It is desirable to avoid the use of spring-hinges in closets of the class to which the present invention belongs not only because they are expensive, but because where they are used the operativeness of the entire device depends upon their being kept in perfect working order, and experience shows that they are frequently loosened or broken by the severe strains to which they are subjected

through accident or carelessness. It is desirable, therefore, to have the valve mechanism complete in itself and of such a nature that it will do its duty whether the seat connection is disabled or not. In the construction shown in my former patent, No. 374,310, dated December 6, 1887, if the hinges are injured so that they permit the seat to fall its weight will unseat the valve in the water-supply pipe and may or may not seat the valve which controls the flow of water into the bowl, and this would be decidedly objectionable; but by providing a spring which positively controls the valve E, regardless of the condition of the seat-hinges, the valve in the supply-pipe cannot be accidentally unseated.

When weight is applied to the seat, the valve-stem *p* is forced back, closing the valve E against valve-seat *j* and cutting off the supply to the bowl. At the same time valve D is opened, allowing water to flow through pipe C into the tank. The closing of one valve and the opening of the other are made reciprocal by the rocker F, which rests between the two valve-stems. When the weight is removed from the seat again, valve D closes and valve E opens, and the water in the tank is forced down through pipe C′ into the bowl. The pipe C′ has a port or passage *u*, which communicates with the jet-passage *g* and similar ports, which communicate with the side passage *t*. When the valve E is opened, these passages are uncovered, and when closed they are cut off.

The seat *j* is formed upon the end of a tube G, which is located within and is independent of the pipe C′, the two being provided with engaging threads which permit the adjustment of the tube within the pipe and relatively to the valve E. This is very important in an apparatus of the character in question, in which the force with which the water is discharged from the tank depends upon the extent to which the water upon entering the tank compresses the air therein, and this in turn depends upon the pressure of the water in the service-pipe. As the pressure in the service-pipe differs and as it is necessary in order to get the best results that the water be admitted to the bowl at or near a certain velocity the independent adjustable seat for the valve E is an important feature. For instance, if the pressure is one hundred pounds the tube is adjusted outward to leave less space between the valve and seat. If it is only twenty-five pounds, it is adjusted inward to give greater space. If there is too much force, the stream overrides and splashes the bowl. By this means the flow can be regulated exactly to the pressure. A packing-cup *u′* is attached to valve-stem *p* in advance of the valve E, in order to prevent the water from flowing around the valve-stem and out through the hole in which the valve-stem rests and into the bowl. It forces the water to pass through the lateral discharges into the bowl, as before described. On the inner side the packing-cup rests against a solid shoulder *v* of the valve-stem. On the outer side a loose washer *w* is held against it by a packing-ring *z*, fitted into a groove of the valve-stem. When the valve-stem is fully thrown out, this packing-ring rests against the facing of the pipe C′ that fits the bowl, thus doubly packing the valve-stem. The valve E is a disk valve and is preferably of half-globular form, as shown, and its base rests within a flanged shoulder of the valve-stem, said flanged shoulder holding it in place and preventing it from being crushed out under great pressure.

The closet-seat B is hinged to the seat-rail *e* in the usual way. When the pipe C is brought in close contact with the bowl, as is sometimes the case, I employ a bracket H, Figs. 5, 6, and 7, for sustaining the rear edge of the rail. This bracket may be attached to the water-supply pipe in any suitable manner, but preferably by two perforated lugs H′, formed on it, and a screw passing through said lugs and a similar lug $C^{\times}$ on the pipe, as shown in Fig. 7. The bracket is also provided with lugs a^2, which engage shoulders on the bowl resulting from sockets b^2. It also has backwardly-projecting lugs c^2 c^2, to which the rear edge of the rail is secured by bolts d^2 d^2. It also has set-screws f^2 f^2, by which the bracket is tightened to the bowl and adjusted in place, said screws screwing against the outside of the bowl.

Even during proper and careful use (to say nothing of careless and rough use, accidents, &c.) the seat is subjected to severe strains, and where it is attached directly to a bowl of earthenware the ware is frequently cracked and broken. It is for this reason that it is sometimes desirable to attach it to the water-supply pipe.

It is a well-known fact that when water and air are confined together under pressure in a tank the water absorbs more or less of the air, and this is true of flushing attachments of the character shown and described. It therefore follows that the escaping water will carry off with it just so much of the air as it has absorbed, so that when sufficient water has been discharged to reduce the pressure within the tank to atmospheric, the volume of air within the tank will be less than when the water was admitted, or, in other words, the tank will contain more or less water, and this water can escape only so fast as air can pass upward through the pipe C and enter the tank. This the air can do so long as the lower end of the pipe C is not submerged, but unless some means is employed to prevent it the air in passing upward through the pipe and entering the tank will produce a very disagreeable gurgling noise similar in character to but very much louder than that produced when liquid is escaping from an inverted bottle. In order to avoid this noise, I locate the main outlet of the tank some distance above its bottom and pro-

vide an auxiliary outlet of very much less capacity than the main outlet through which the water below the main outlet may drain out slowly. The main outlet is located at such distance above the bottom of the tank that in escaping the level of the water can reach it without requiring the admission of air to the tank. As shown in the drawings, the pipe C is provided with an extension *k*, that projects upward into the tank for the proper distance, and the open end of this extension constitutes the main outlet, and the auxiliary outlet consists of an opening *l*, formed in the side of this extension near the bottom of the tank. With this arrangement the water will discharge rapidly until it reaches the level of the upper end of this extension, and after it reaches this level the remaining water will escape through the opening *l*.

I am aware that it has been proposed to use in combination an elevated tank, a pipe extending from the tank to the bowl, said pipe being without a valve or other device for cutting off communication between the tank and bowl, but having an extension projecting upward into the tank and terminating near the top thereof, said extension having a lateral opening near the bottom of the tank, a water-supply pipe communicating with the tank, and a valve in said pipe. This arrangement is such that as fast as water is admitted to the tank a portion of it will flow out through the lateral opening in the extension of the pipe leading to the bowl and through said pipe to the bowl, and should the valve in the supply-pipe be kept open long enough the water in the tank will reach the level of the upper end of the extension, after which the water will escape from the tank as fast as it enters. After the supply is cut off the water remaining in the tank escapes through the lateral opening of the upward extension of the bowl-pipe and through said pipe into the bowl. This apparatus is merely for providing an after-fill and in no sense can it be considered an "air-tight tank" within the meaning of that term as used in this specification. It is not air-tight. It is constantly in open communication with the bowl.

The term "air-tight tank" as used in this specification means a flushing-tank of such construction that it confines a body of air that is compressed when water is introduced into the tank under pressure.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a water-closet, the combination with an air-tight tank and a bowl, of a water-supply pipe, a valve arranged therein, a spring holding said valve normally seated, a pipe leading to the tank, a pipe leading to the bowl, a valve-seat arranged therein and adjustable independently thereof, a valve E adapted to close upon said seat, means for transmitting movement from the valve E to the valve first aforesaid, and a stem fixed to the valve E and projecting from the pipe in position to be engaged and operated, substantially as set forth.

2. In a water-closet, the combination with an air-tight tank and a bowl, of a water-supply pipe, a valve arranged therein, a spring holding said valve normally seated, a pipe leading to the tank, a pipe leading to the bowl, a valve E and valve-seat arranged therein, said valve and seat being relatively adjustable so that the closed position of the valve may be varied, a stem fixed to the valve and projecting from the pipe and into the bowl, a seat having a projection adapted to engage said stem, means for transmitting movement from the valve E to the valve first aforesaid, and a spring holding the valve E normally unseated, said spring being of sufficient strength to hold the seat partly elevated, substantially as set forth.

3. In a water-closet, the combination with an air-tight tank and a bowl, of a water-supply pipe, a valve and valve-seat arranged therein, a spring holding said valve normally seated, a pipe leading to the tank, a pipe leading to the bowl, a valve E and valve-seat arranged therein, said valve-seat being adjustable, a stem fixed to the valve and projecting from the pipe and into the bowl, a seat having a projection adapted to engage said stem, means for transmitting movement from the valve E to the valve first aforesaid, and a spring holding the valve E normally unseated, said spring being of sufficient strength to hold the seat partly elevated, substantially as set forth.

4. In a water-closet, the combination with a tank and a bowl, of a water-supply pipe, a valve and valve-seat arranged therein, a spring holding said valve normally seated, a pipe leading to the tank, a pipe C′ leading to the bowl, a valve E arranged therein and having a stem projecting from the pipe in position to be operated upon, means for transmitting movement from the valve E to the valve first aforesaid, and the adjustable tube G arranged in the pipe C′ and having a seat *j* for the valve E, substantially as set forth.

5. In a water-closet, the combination with the bowl and a water-supply pipe, of a seat adapted to rest upon the bowl, a rail to which said seat is hinged; a bracket to which said rail is secured, said bracket having lugs a^2 engaging the bowl, and means for securing the bracket to the water-supply pipe, substantially as set forth.

6. In a water-closet the combination with the bowl, of a flushing-tank having a main outlet and an auxiliary outlet located below the main outlet, a pipe for conveying water from said outlets to the bowl, a valve in said pipe and means for seating said valve while the tank is being filled, substantially as set forth.

7. In a water-closet, the combination with the bowl, of an air-tight flushing-tank having

a main outlet located above the bottom thereof and an auxiliary outlet located below the main outlet, a pipe for conveying water from said outlets to the bowl, a valve in said pipe and means for seating said valve while the tank is being filled, substantially as set forth.

8. In a water-closet, the combination with the bowl, of an air-tight tank having a main outlet and an auxiliary outlet located below the main outlet, pipes for supplying the tank with water and for conveying water therefrom to the bowl, valves in said pipes, and means for reciprocally operating said valves, seating one and unseating the other, substantially as set forth.

9. In a water-closet, the combination with the bowl, of an air-tight tank and a discharge-pipe extending through and terminating some distance above the bottom of the tank, and having a lateral opening between its upper end and the bottom of the tank, and means for closing said pipe while the tank is being filled, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

PATRICK J. MADDEN.

Witnesses:
R. F. OSGOOD,
P. B. HULETT.