

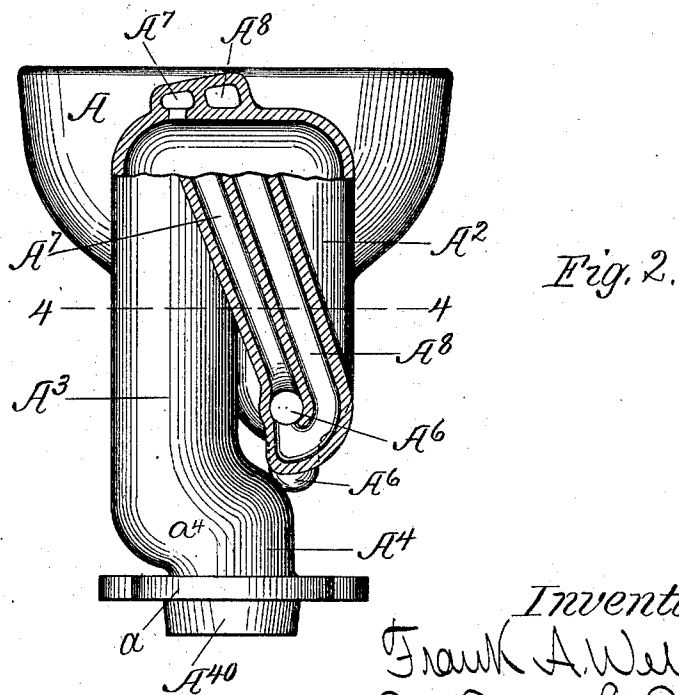
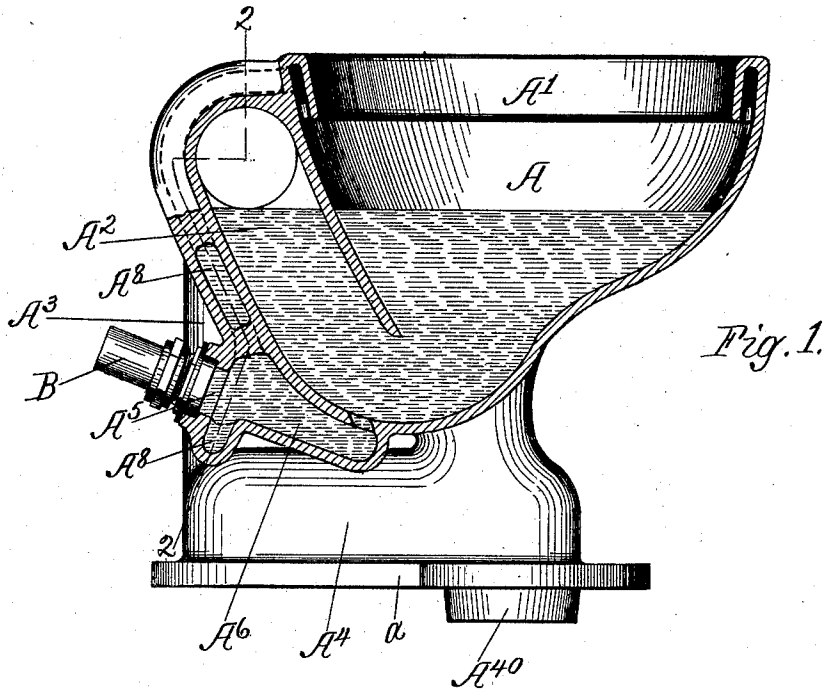
(No Model.)

2 Sheets—Sheet 1.

F. A. WELLS.
WATER CLOSET.

No. 502,452.

Patented Aug. 1, 1893.



Witnesses,
E. T. May,
Jean Elliott.

Inventor,
Frank A. Wells
By Burton ^{att} Burton
his attys.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

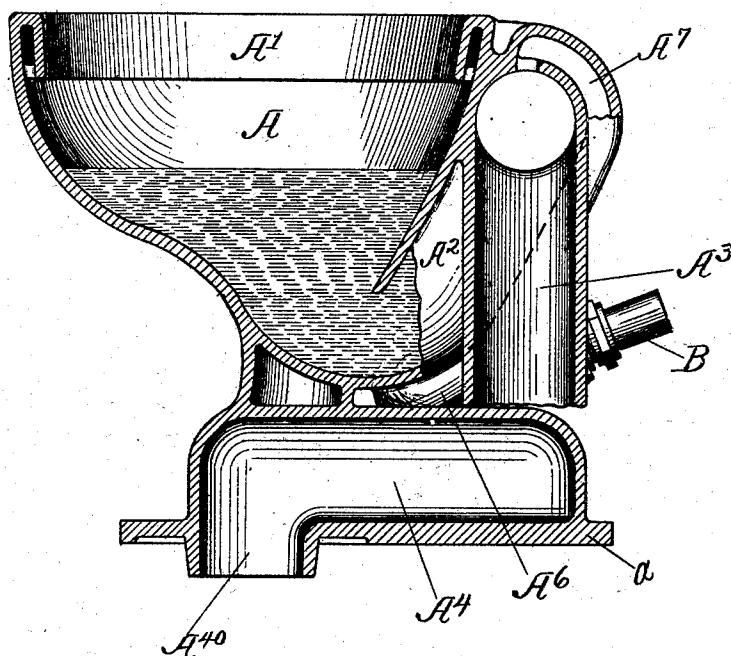
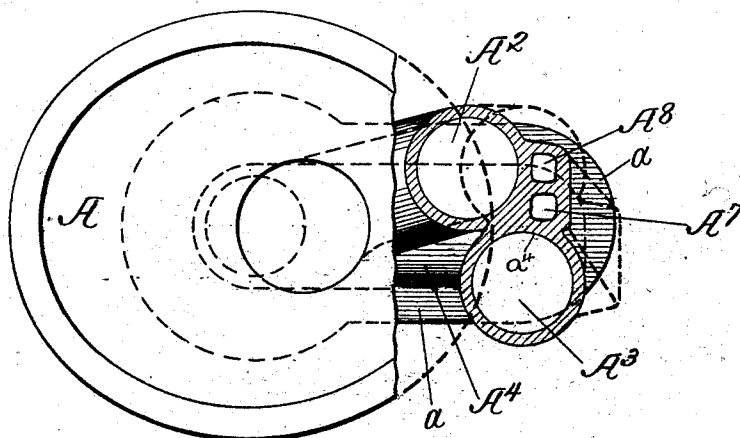


Fig. 4.



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UNITED STATES PATENT OFFICE.

FRANK A. WELLS, OF NEW YORK, N. Y.

WATER-CLOSET.

SPECIFICATION forming part of Letters Patent No. 502,452, dated August 1, 1893.

Application filed July 14, 1892. Serial No. 439,958. (No model.)

To all whom it may concern:

Be it known that I, FRANK A. WELLS, a citizen of the United States, residing at New York, county of New York, and State of New York, have invented certain new and useful Improvements in Water-Closets, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part thereof.

In the drawings, Figure 1 is a vertical section from front to rear through the up-limb of the discharge passage of my improved closet. Fig. 2 is a sectional rear elevation, section being made in a transverse plane through the water jet passages at the plane indicated by the line 2—2 on Fig. 1. Fig. 3 is a vertical section from front to rear through the down-limb of the siphonic discharge passage. Fig. 4 is a sectional plan, section being made at the line 4—4 on Fig. 2 through the limbs of the siphon and the water jet passages, the remainder of the bowl being shown in plan, the heavy dotted lines indicating the complete plan outline, and the light dotted lines being the continuation of the outline at the plane of the incomplete section at said line 4—4.

This invention has to do with the arrangement of the discharge passages and of the water flushing and siphon creating jet passages of a water closet bowl which is designed to be evacuated by siphonic action induced primarily by the movement given to the water in the up-limb by a forcible jet introduced thereinto at the bottom; and its special features are such as to bring into operation certain othersiphon-producing causes which act concurrently with the forcible jet. These features, consisting, in general, of a jet which I call an "air dispersing" jet discharging into the down-limb of the siphon, and a formation of the discharge passage such that said air-dispersing jet, and subsequently also, the outflow through the down-limb of the siphon, are retarded without constriction of the discharge passage or irregularity therein, and caused to accumulate in the down-limb and thereby hasten the priming and insure the maintenance of the siphon. These two latter features,—to-wit, the air-dispersing jet and the particular form of the discharge passage,—co-operate also, the form of the passage tending to dis-

perse the jet and increase its effectiveness as a means of dispersing and carrying the air from the down limb of the siphon on before it and with it into the sewer.

A is the bowl; A', the flushing rim; A², the up-limb of the discharge passage; A³, the down-limb, which is vertical and leads to a horizontal passage A⁴, set off by the short side-wardly extending portion α^4 from which the passage A⁴ extends underneath the bowl to the final discharge passage or outlet A⁴⁰.

B is the water supply pipe, which leads from any source which may afford water supply under pressure, such as the customary elevated tank, which is connected to the bowl at the boss which contains the water supply passage A⁵. This water supply passage divides immediately into three jets: first, the water-lifting jet A⁶, which leads downward to the lower end of the up-limb, and opens through the bottom of the latter centrally with respect thereto, and is adapted, therefore, to discharge a jet of water axially up the up-limb toward the crown of the trap; second, the air-dispersing jet A⁷, which extends upward alongside of the down-limb and over the crown of the siphon, and opens downwardly through the crown coaxially with the said down-limb, so that it will be adapted to discharge a jet down that limb, which will strike the bottom of the passage A⁴ at the angle between the portion α^4 of said passage and the down-limb A³ and will be again deflected abruptly at the end of the said offset portion α^4 , and be forcibly dispersed in a fine spray which will take up a large quantity of air in bubbles and pass it on in foam through the passage A⁴ to the sewer; third, the flushing jet A⁸, which extends up alongside the up-limb and over the crown of the trap to the flushing rim which it supplies with water in the usual manner. The water constituting the second of these jets when it strikes the offset A⁴, being thereby retarded, accumulates in the down-limb A³, and, in addition to its office of carrying or drawing out the air from the down-limb, tends also to fill the down-limb with the water and prime the siphon, and this priming, due to retardment, is an important feature of the structure.

It will be observed that the boss to which the supply pipe B is connected, is located be-

low the water line of the bowl, and that the first and greatest force of the water, when supplied to the closet, is exerted through the water-lifting jet A⁶, since the passage is most directly continuous in direction with the initial passage A³; also, that the air-dispersing jet is supplied by a passage shorter and freer than that which supplies the flushing rim, so that that jet will discharge into the down-limb of the siphon before the water will begin to flow through the flushing rim. Both jets A⁶ and A⁷, therefore, will be in operation priming the water siphon by filling the down-limb with water and forcing and carrying the air therefrom before the water begins to flow into the bowl through the flushing rim, and the siphonic action of the water will be initiated by the time the flushing water thus reaches the bowl through the rim. I prefer to extend the down-limb A³ vertically from the crown of the trap to the bottom of the bowl, and to cause it to make a right-angular bend to pass under the bowl in the off-set A⁴ of the discharge passage for the purposes above indicated with respect to the jet A⁷,—to-wit, the dispersion of the jet and the retardment of the water thereof, and for a purpose with respect to the outflow from the bowl similar to the second purpose mentioned with respect to the jet A⁷,—to-wit, that the retardment of the water when it strikes the bottom of the offset A⁴, causes it to accumulate in the down-limb A³ and prime it, or maintain the siphon in it in the same manner as such retardment would be caused by a constriction of the passage beyond the down-limb, but without that objectionable feature which, as is well understood, makes the closet liable to become clogged, because solid substance, which can pass through the larger diameter of the discharge passage anteriorly to such construction, is liable to become lodged at the constricted portion. Also, by extending the down-limb vertically from the crown of the siphon to the base of the fixture, and then horizontally to the discharge in the sewer, said down-limb and the horizontal offset limb A⁴ are both utilized for the support of the fixture, a flange *a* at the base extending directly off from the horizontal offset limb A⁴.

The additional advantage afforded by the right angle bend in the discharge passage between the vertical limb A³ and the horizontal limb A⁴, which has already been indicated in the description of the action, may be more fully described. The air-dispersing jet discharges downwardly through the vertical passage, and spreading somewhat, as will be inevitable in such discharge, is furthermore completely broken and dispersed by striking upon the bottom of the passage A⁴ at the angle, whereby it is churned into foam and thrown to the opposite wall of the off-set. The water is thus temporarily retarded till the siphon is primed, and is discharged through the passage A⁴, in a foamed condition, and carries off a much greater quantity of air than

it could do merely by being sprayed from its discharge opening, and thus more effectually assists in producing the siphonic action which is designed. The up-limb and down-limb of the discharge passage are located side by side adjacent to the bowl, as distinguished from the arrangement of the down-limb outside the up-limb. This arrangement of the two limbs of the discharge passage leaves space in the depression between them for the water jet passage, which, on account of such location, does not require any extension of the earthenware beyond the lateral compass which is necessary for the two discharge limbs except where the said water passages necessarily pass over the crown of the siphon in order to discharge into the crown and into the flushing rim. The extent to which the lateral compass of the earthenware is thus increased is indicated in Figs. 1 and 3, at the upper part where the passage for the jet A⁷ appears. It will be noticed that this increase in extent is not more than is necessary to provide a suitable boss for the connection of the water-supply pipe B, so that said boss, and not the passages, practically determine the extent of the earthenware in that direction. Since the water connections to this fixture are entirely below the water line, so that the water-lifting jet discharges into a solid body of water, and the air-dispersing jet discharges into an open air space which has no exterior air connection but is inclosed beyond the up-limb of the siphon which is filled with water, the operation of the fixture is practically noiseless, the slight sound that is produced by the impact of the air-dispersing jet at the bottom of the passage A³, being scarcely perceptible on account of the slight vibratory character of earthenware, and the lack of air connection from the passage into which this discharge is made to the outer air, and the further fact, that almost immediately upon the commencement of the action of the air-dispersing jet, the water from the up-limb of the siphon being lifted over by the water-lifting jet, closes the passage in the down-limb with a comparatively solid body of water, which carries before it the foam produced by the impact of the water-dispersing jet, which is thus forced into the sewer before the air in said foam has opportunity to work back through the water to the crown of the trap. It should also be observed that the entire joint formed between the boss through which the water enters and the water-supply pipe B, are located below the water line, so that if, through any defect in the construction or accident arising afterward, that joint is otherwise than perfectly tight, leakage through it will be observable, because the water always stands in it and above it. A further advantage of this location of the joint is that it is never dry, and is thereby not liable to deterioration which may happen when packing in such a joint is alternately wet and dry. It will also be observed that this is the only connection required to this

closet except the connection at the discharge to the sewer.

I claim—

1. In a water closet, the bowl and the siphonic discharge passage thereof, the down limb of the discharge passage being substantially vertical and merging directly in a horizontal passage, said horizontal passage being set off or deflected at substantially a right angle and leading to the final discharge; whereby the outgoing water is twice turned abruptly at a right angle in its course to the final discharge as and for the purpose set forth.

2. In a water closet, the bowl and the siphonic discharge passage and the water supply passages, the down limb of the discharge passage being substantially vertical and merging directly in a horizontal passage, said horizontal passage being set off or deflected at a right angle and leading to the final discharge, the water passage which enters the crown of the siphon being directed toward the bottom of the vertical down limb, substantially as and for the purpose set forth.

3. In a water closet, the bowl and the siphonic discharge passages, and the water jet passages formed integrally; the down-limb of the discharge being turned side-ward from the up-limb, as distinguished from outward, the water supply passage entering in the depression between the up-limb and down-limb entirely below the water line, and with a general downward direction corresponding to

the slope of the up-limb, said passage being divided into three passages, one of which continues down in the interval between the two limbs of the siphon, and thence under the up-limb, discharging upwardly thereinto toward the crown of the trap; another passage extending upwardly to the crown of the siphon and discharging downwardly into the down-limb; and the third passage extending up in the depression between the two limbs and thence over the crown of the trap into the flushing rim: substantially as and for the purpose set forth.

4. In a water closet, the bowl A, and the discharge passage therefrom having the inclined up-limb A²; the vertical down-limb A³, turned side-ward from the up-limb, and the horizontal off-set A⁴ underneath the bowl; and the water jet A⁵, lying in the depression between the two limbs, and having three branches,—A⁶, leading to the bottom of the up-limb; A⁷, leading to the top of the down-limb, and A⁸, leading to the flushing rim; all said bowl, discharge passages and water passages being formed integrally of earthenware: substantially as set forth.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, this 30th day of June, 1892.

FRANK A. WELLS.

Witnesses:

ARNOLD BEHREO,
MATTHEW J. MCKENNA.