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(No Model.)

2 Sheets—Sheet 1.

S. W. LEWIS.
WATER CLOSET AND URINAL.

No. 555,455.

Patented Feb. 25, 1896.

Fig. 1

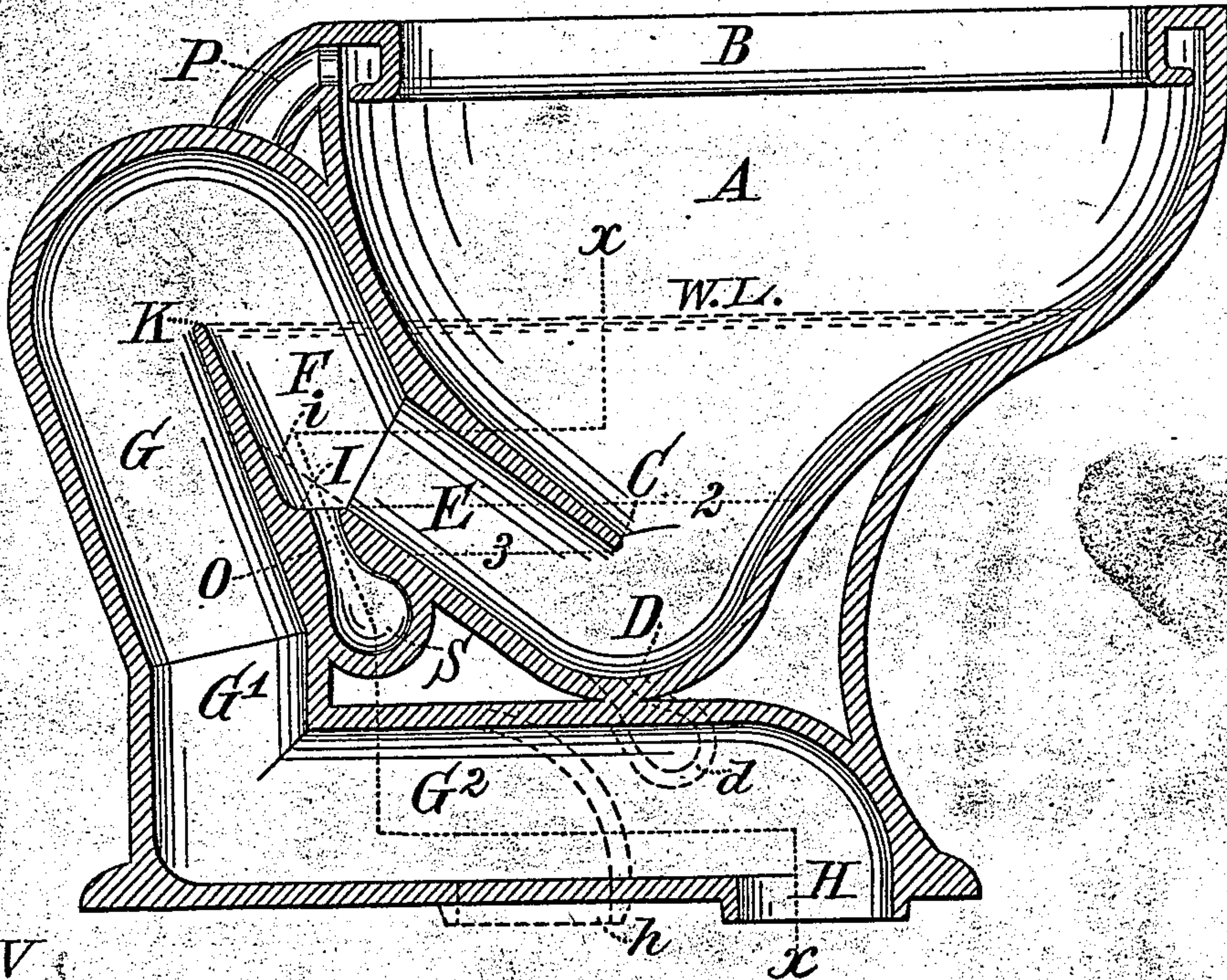


Fig. 2

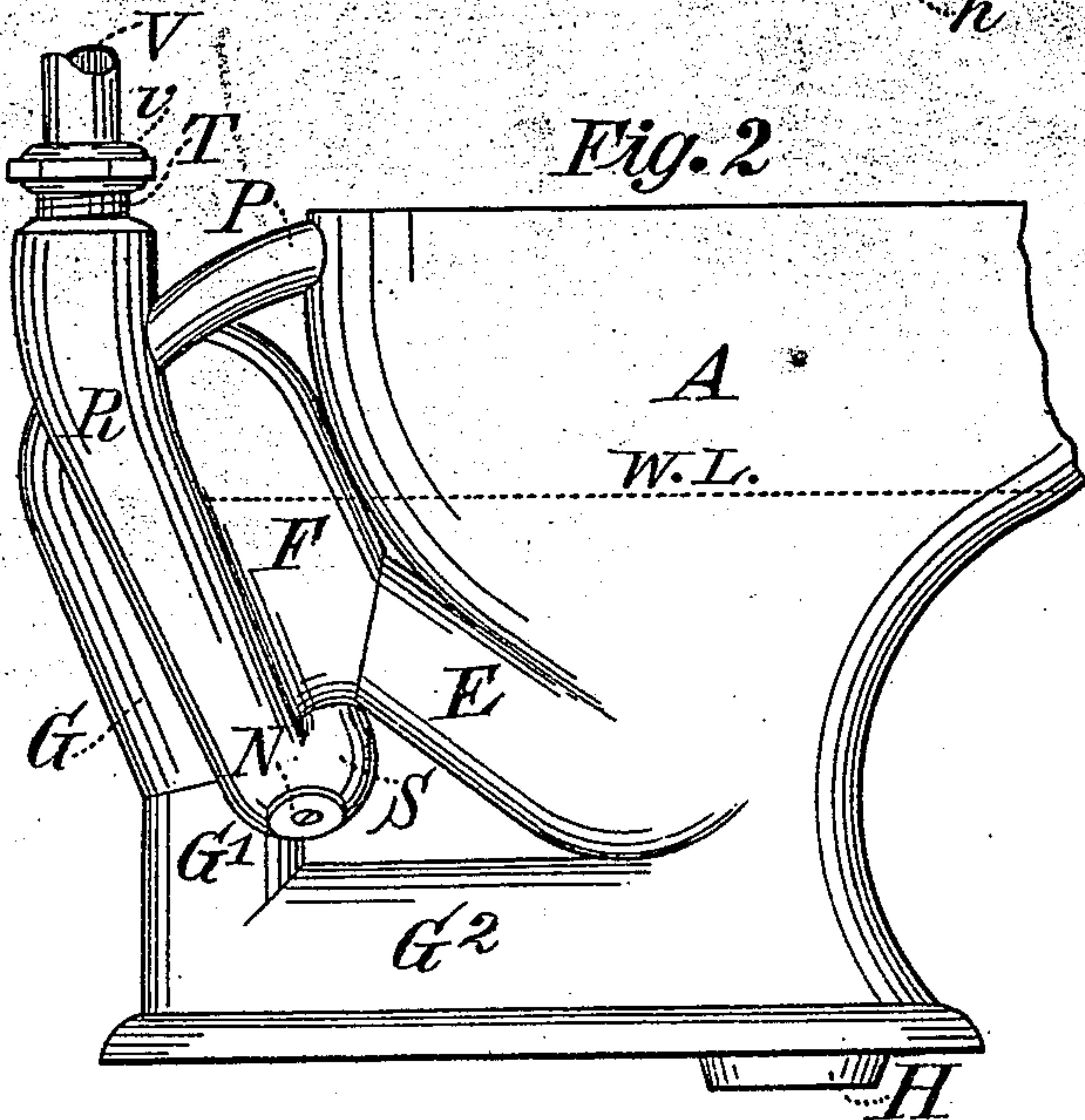
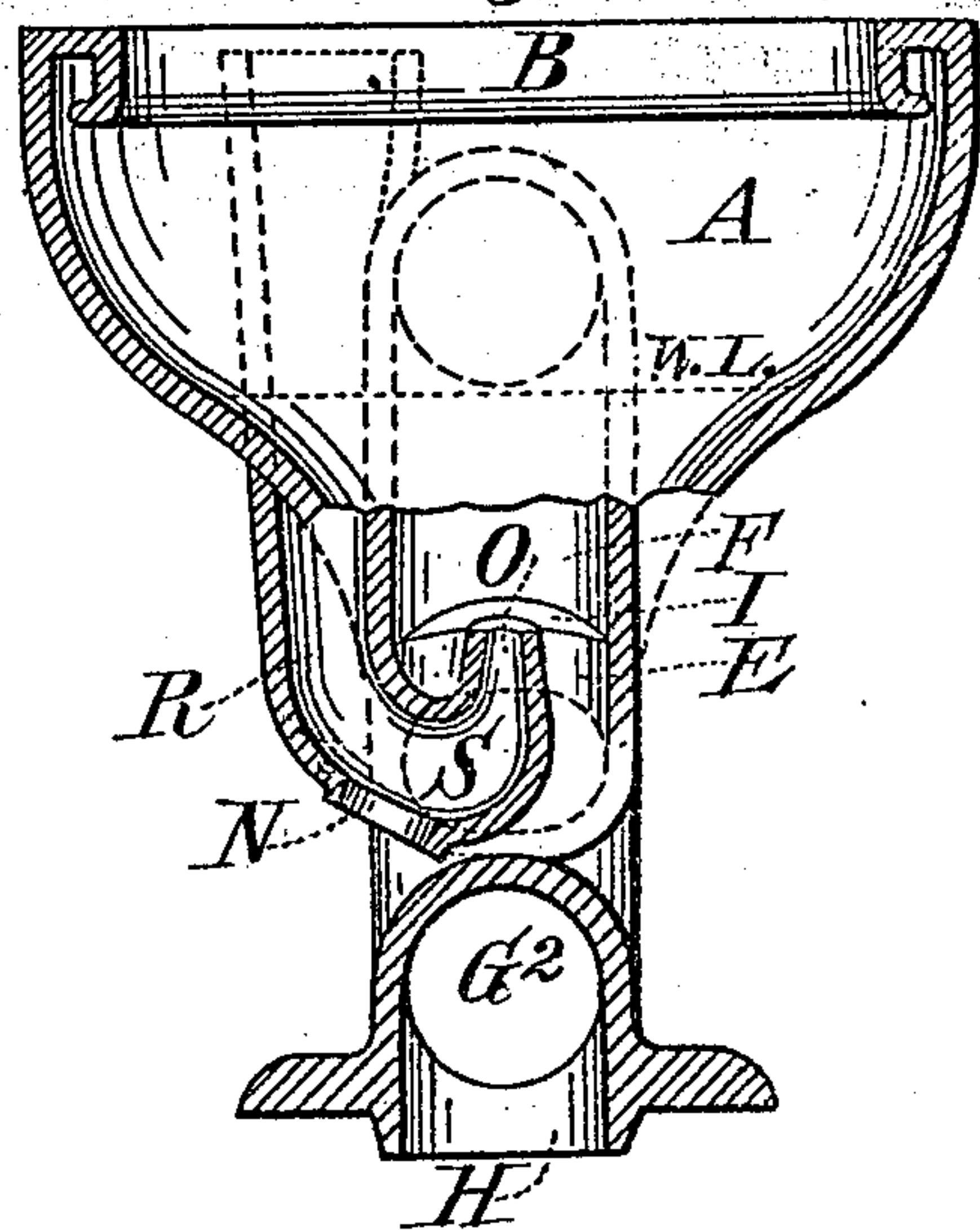


Fig. 3



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Fig. 4

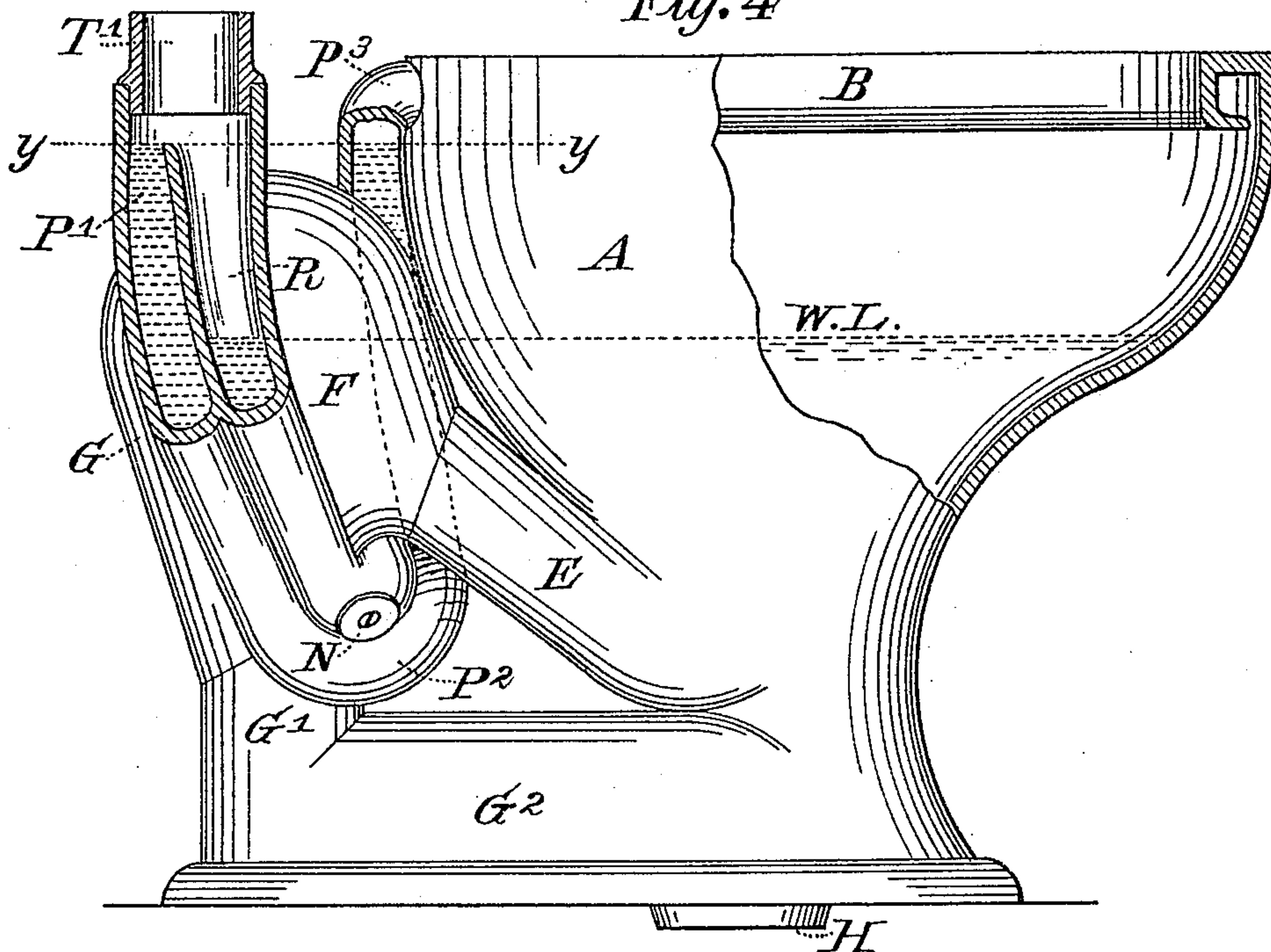


Fig. 5

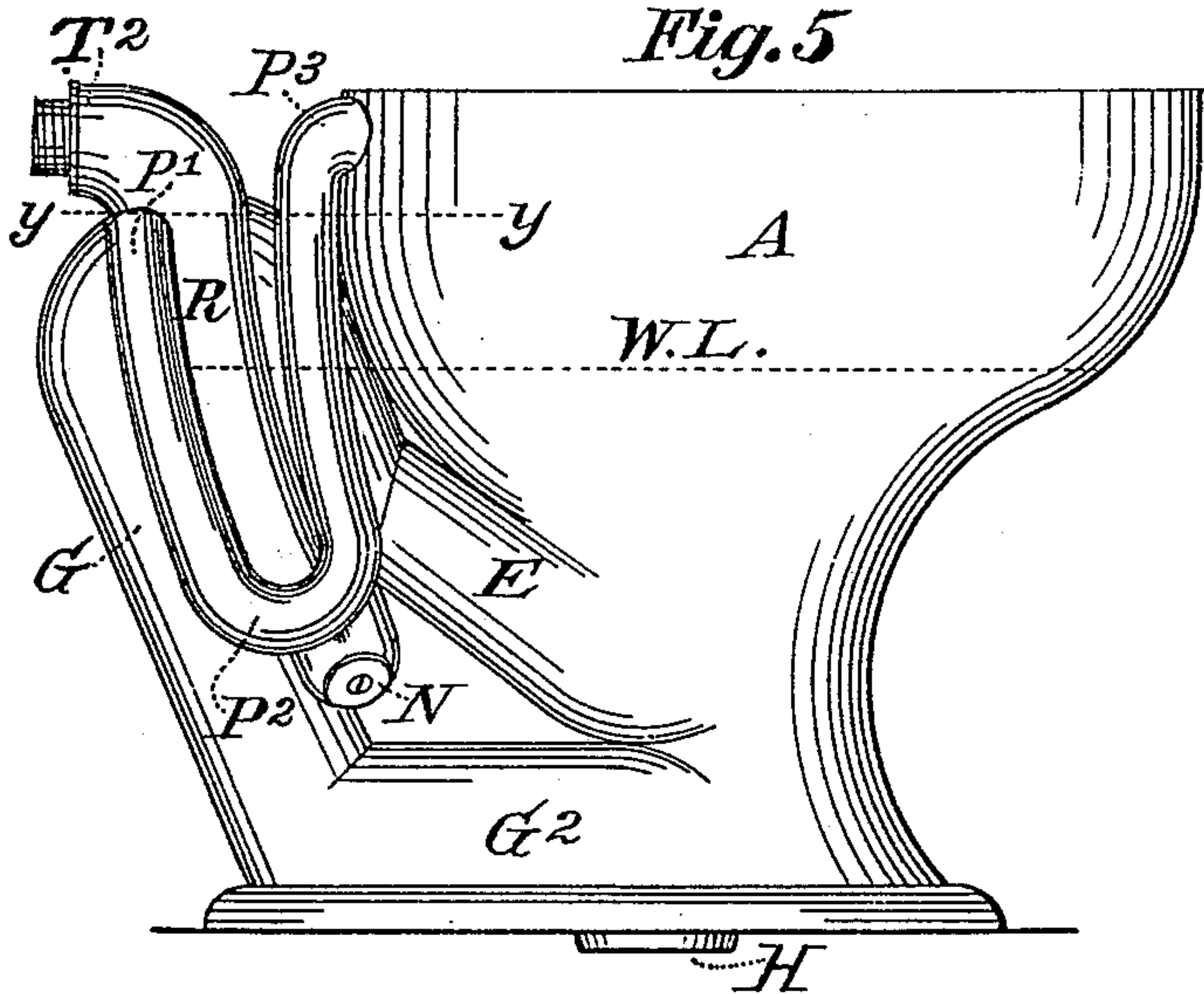
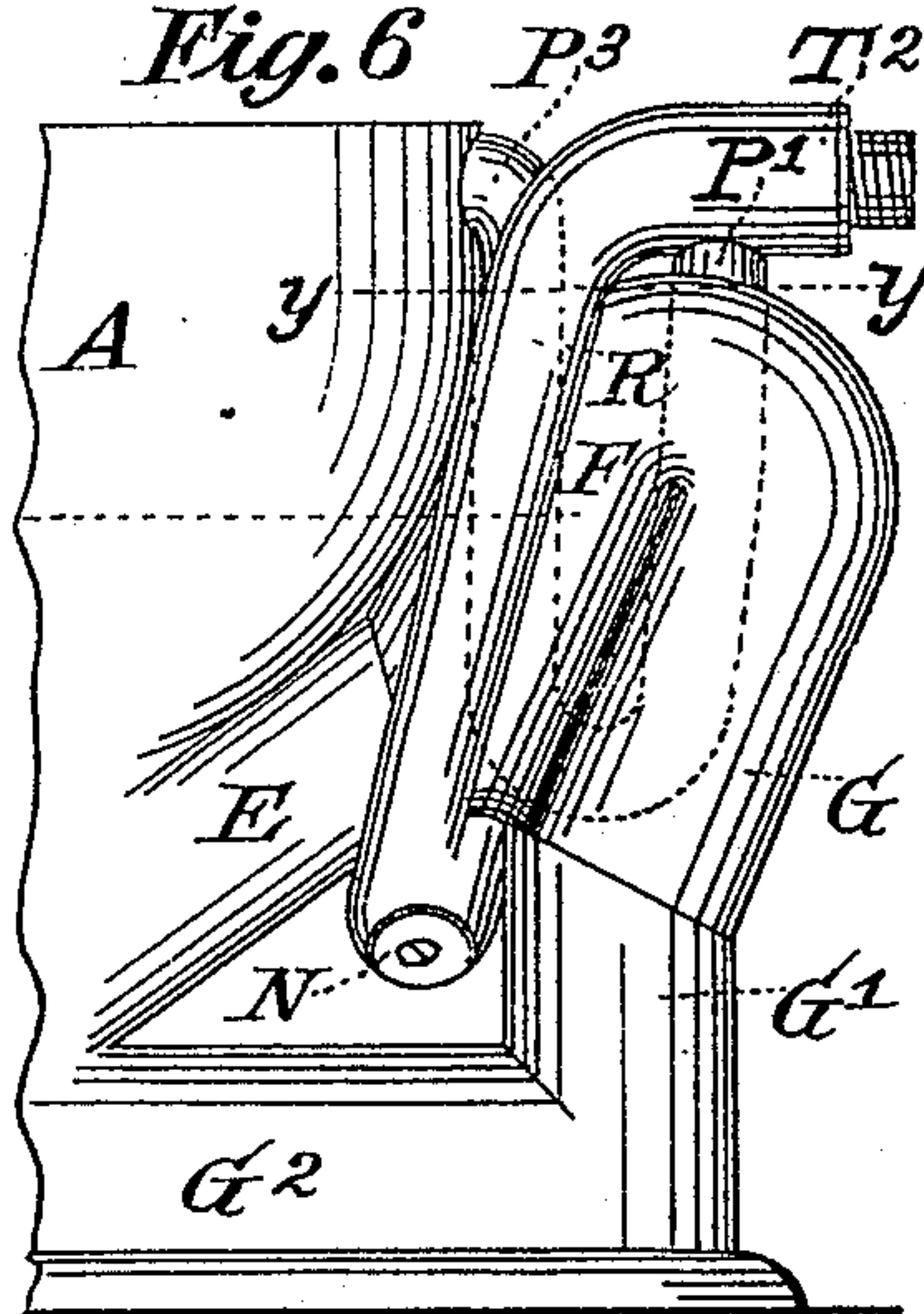


Fig. 6



Witnesses

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UNITED STATES PATENT OFFICE.

SAMUEL WALKER LEWIS, OF BROOKLYN, NEW YORK.

WATER-CLOSET AND URINAL.

SPECIFICATION forming part of Letters Patent No. 555,455, dated February 25, 1896.

Application filed January 2, 1895. Serial No. 533,532. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL WALKER LEWIS, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Water-Closets and Urinals, of which the following is a specification.

My invention relates to what are known as "siphon-jet" water-closets and urinals, in which one or more jets are used, which I will term a "jet-flushing means," and has for its several objects, first, to prevent choking or clogging in the outlet-passage or to confine any such stoppage which may occur within a fixed or limited space that shall always be conveniently accessible; second, to shut off and muffle the noise made by the jet when discharging into the trapped outlet-passage; and by the same means to locate the jet and its supply connection wholly above the bottom of the hopper or its outlet, whereby the siphon or outlet-passage can be extended horizontally under the hopper to connect with the soil-pipe at any desired point without materially altering the proportions of the apparatus; third, to prevent the noise made by the unchecked discharge of air from the flush or supply pipe when driven out at the rim-flushing means of the hopper. I attain these objects by the construction illustrated in the accompanying drawings, in which—

Figure 1, on Sheet 1, is a central vertical section showing details of siphon-outlet trap and location of the jet-flushing means. Fig. 2 is an external view, in side elevation, of the same. Fig. 3 is a vertical cross-section of Fig. 1 on the line $x x$. On Sheet 2, Fig. 4, is a view in side elevation, partly in section, to illustrate one method of supplying the rim-flushing means and excluding the air therefrom. Figs. 5 and 6 are external views, in side elevation, to illustrate modified applications of both jet and rim flushing means.

The same letters of reference indicate identical parts in all the views.

The receiving hopper or bowl A is provided with an upper or rim flushing means, which may be hollow and perforated, as shown at B, or otherwise, and with sloping walls or sides terminating in an outlet into a trapped passage E, F or siphon E F G. The lower

edge of the dividing-wall C forms the seal at the dotted line 3, and the bend of the passage or siphon at K forms the trap, weir or dam which maintains the normal level of water in the hopper A. The upleg E F of the trapped outlet-passage is divided into at least two parts or sections, preferably of unequal cross-sectional areas, the upper part, F, being the largest, and preferably adapted to receive the jet-discharge directly into it. The lower and smaller part or section, E, is preferably arranged below the jet-outlet O and to lead from the hopper-outlet to the larger section, F, at such an angle as to direct the contents of the hopper toward and within or across the line and force of jet-discharge. Furthermore, the deflection or angle E F of the upleg enables me to carry the wall of the hopper straight down and thus materially increase the length of water-surface where most needed in the hopper.

At the junction of said sections E F, I preferably form an offset or ledge I, from which the jet-pipe O discharges, whereby the contents of the hopper A is more easily directed into the larger space F and over the jet-discharge, but the bottom wall of the section E could be extended to intersect the lower wall of section F, as shown by the dotted line i , without changing the elements of the invention, and the jet or jets might be discharged upwardly from the side or sides of said upleg instead of directly underneath. The section E being the smallest part of the trap, what passes through it directed toward the jet-force will easily pass through the larger portions of the trap or passage. Therefore should any large substance be carelessly thrown into the hopper and choke the outlet-passage or siphon such stoppage will be limited to the length of the section E and easily accessible from the hopper-outlet at C D.

I preferably make the outlet-passage in the usual siphon form, as shown at G, G', and G², whereby the tortuous passage thus formed facilitates the priming to produce siphonic action; but said tortuous passage is not an element of nor essential to my invention, and the downleg of the siphon or passage can be modified, as in Fig. 5, or in any suitable way. By elevating the jet flushing means above the bottom D of the hopper I have less re-

sistance to overcome in the initial action when the jet first discharges into the trap. Hence I can operate with a smaller jet, prime the siphon more quickly and secure a more copious downwash on the walls of the hopper. In other words, I increase the force, reduce the jet-waste and increase the rim-flush without increasing the quantity of water used. Furthermore the jet action being wholly beyond the point of seal at C, shut off by the intervening wall C of the hopper and the flow of water up the passage E, its noise is completely muffled and cannot be heard.

Another important advantage of locating the jet and its supply connection above the bottom of the hopper is that the downleg or outlet-passage can be extended horizontally, so as to connect with the soil-pipe at any desired point, which is impossible with the old construction in this class or type of closets, as shown by the dotted lines at *d*, Fig. 1, and this enables me to make my closets with differently-located outlets, whereby they can be substituted for other closets without having to tear up floors or change the location of soil-pipe connections.

In Fig. 2 the rim flushing means, for the purpose of illustration, is shown as supplied through the usual branch at P, but with such construction the air in the pipe V is violently discharged with the water at the rim B, causing a very disagreeable noise, to avoid which I trap the conduit leading to the rim flushing means and also make it longer than the conduit leading to the jet flushing means, whereby the longer conduit causing more friction resistance will deliver the water more quietly at the rim and present more resistance to the escape of air, but to secure the best results the conduit leading to the upper or rim flushing means, should be more deeply trapped than the jet flushing means, and to obtain this result I preferably separate the rim and jet supplies above the normal level of the water in the hopper, as shown by dotted lines *yy*, in Figs. 4, 5 and 6, whereby the normal level of water at *yy* in the rim-conduit is relatively higher and its trap deeper than the normal height and depth of water in the jet-conduit R, which is at the same height as at the dotted line W L in the hopper. Hence in operation the resistance to be overcome in the rim-conduit, which forms the loop P' P² P³, is so much greater that all the air in the supply or flush pipe is easily and noiselessly expelled through the jet outlet or outlets into the trap, when the water having filled the supply or flush pipe and conduits, the increasing pressure, which is then equal in all the conduits, causes the water to also flow freely through the rim flushing means, which overflow completely flushes down the walls of the hopper without any noise other than the slight ripple caused by the water flowing into the outlet at C D. This feature of separate water-sealed supply-conduits of unequal depths of seal I do not

limit to any particular location or formation of jet flushing means, provided the conduit having least depth of seal leads to the jet flushing means and the conduit having greatest depth of seal leads to the rim, whereby the air will pass through the conduit of least depth and resistance and thus escape through the jet flushing means.

In Fig. 4 the supply connection T' is vertical and divided into two conduits, the jet-conduit R leading directly to the jet and its water-line W L being the same as in the hopper. The rim-conduit P' P² P³ passes down on one side of the apparatus and up on the other side, as indicated by dotted lines, its loop forming a deep trap in which the depth of water is indicated by the dotted line *yy*.

In Figs. 5 and 6 the closet is supplied through a horizontal connection T², the rim-conduit leading preferably from the under side of said supply-horn, so that the air may pass over and beyond the entrance to said conduit and thus more easily be forced out through the jet flushing means. In Fig. 5 both jet-conduit R and rim-conduit P' P² P³ are arranged on the same side of the closet. In Fig. 6 the jet-conduit R passes down on one side and the rim-conduit is trapped by a loop on the other side, as indicated by dotted lines from P' to P³. Another modification would be to extend the rim-conduit horizontally from P² on one side, thence around the hopper and up on the opposite side to its outlet at P³.

In all the views I have shown an opening at N in the bend S of the conduit R below the jet, which opening may be closed by a plug or otherwise.

In operation, when the cistern-valve or other source of supply is opened the water flowing into the pipe V drives the air before it through the conduit R and jet-pipe O, which passage, as shown by the construction illustrated in Figs. 4, 5 and 6, offers the least resistance and is the most direct outlet. Thus the compressed air in the supply-pipe assists the initial action of the device, while in the old construction shown at P, Figs. 1 and 2, its force would be wholly lost in a noisy, unchecked discharge at the rim. As soon as the air is expelled from the supply or flush pipe V and said pipe is filled with water, a copious overflow through the more deeply-trapped rim-conduit and down the walls of the hopper takes place simultaneously with the discharge of water from the jet-pipe O, but owing to the elements of construction described, and a proper proportion of the several parts, there is no noise other than the gentle ripple of the water into the outlet C D.

It will be observed that the bend of the conduit R at S is not above the level of the seal, as indicated by the dotted line 3. This is essential that the depth of seal be maintained at least until the water in the hopper recedes to the level of said dotted line 3.

It is evident from the examples given that various modifications will accomplish like results.

Having described my invention, I claim—

1. A water-closet or urinal or the like, provided with a receiving hopper or bowl, a rim or upper flushing means therefor and a supply-conduit to said rim flushing means, a trapped outlet-passage from said hopper, a submerged jet flushing means located entirely above the level of the bottom of said hopper-outlet and discharging upwardly into said trapped passage through the wall thereof beyond the entrance thereto and a separate supply-conduit leading direct to said jet flushing means, whereby the contents of the hopper passing across the line of jet-discharge will be driven by it upward over the trap and the noise of the jet-discharge will be muffled by the wall of the hopper, substantially as described.

2. A water-closet or urinal or the like, provided with a receiving hopper or bowl, a rim or upper flushing means therefor and a supply-conduit to said rim flushing means, a trapped siphon outlet-passage from said hopper forming an upleg and a downleg, a submerged jet flushing means located entirely above the level of the bottom of said hopper-outlet and discharging into said upleg through the wall thereof beyond the entrance thereto and a separate supply-conduit leading direct to said jet flushing means, whereby the contents of the hopper crossing the line of jet-discharge will be driven by it up over the trap and said downleg can be extended beneath the level of the bottom of said hopper and the jet flushing means, substantially as described.

3. A water-closet or urinal or the like, having a receiving hopper or bowl, and a trapped outlet-passage therefrom, a part of the upleg of said passage forming the trap being contracted or of less cross-sectional area than the part of the passage beyond it, whereby any substance which passes through said contracted part cannot choke the passage beyond it, substantially as described.

4. A water-closet and urinal or the like, having a receiving hopper or bowl and a trapped outlet-passage therefrom, the upleg of said trap being divided into two parts of unequal cross-sectional areas the upper part thereof being the largest and the lower part thereof leading from the hopper to said larger part at an angle, whereby any substance which passes through said lower and smaller part cannot choke the trap beyond it, and the water-surface in the hopper can be materially lengthened, substantially as described.

5. A water-closet and urinal or the like, having a receiving-hopper an upper flushing therefor, a trapped outlet-passage therefrom having its upleg divided into two parts of unequal cross-sectional areas the upper part thereof being the largest, and a jet flushing means discharging directly into it, said jet flushing means being located beneath the

overflow-level of said trap and above the level of the bottom of said hopper, substantially as described.

6. A water-closet and urinal or the like, having a receiving hopper or bowl and a trapped outlet-passage therefrom, the upleg of said trap being divided into two parts of unequal cross-sectional areas, the upper part thereof being the largest, and an upwardly-directed jet flushing means discharging into it, the lower part thereof being arranged relatively below said jet flushing discharge and to lead from the hopper to said larger part at an angle, whereby the contents of the hopper will be directed toward or within the line and force of jet-discharge, substantially as described.

7. A water-closet and urinal or the like, having a receiving hopper or bowl and a trapped outlet therefrom, the upleg of said trap being divided into two parts, a submerged jet flushing means discharging into the upper part thereof and the lower part thereof leading from the hopper to said upper part at an angle, whereby the contents of the hopper will be directed toward the line and force of jet-discharge, substantially as described.

8. A water-closet or urinal receptacle or the like, provided with a submerged upwardly-directed jet flushing means and a water-sealed supply-conduit thereto, an upper or rim flushing means and a separate supply-conduit for said rim flushing means which is trapped and water-sealed to a greater depth than the supply-conduit to the jet flushing means, substantially as and for the purpose described.

9. A trapped water-closet and urinal receptacle or the like, provided with a jet flushing means and a water-sealed supply-conduit thereto, an upper or rim flushing means a trapped normally water-sealed conduit for said rim flushing means in which the overflow is higher and the water is thereby maintained at a higher level than the normal level of water in said receptacle and jet-supply conduit, whereby the air in the supply-pipe will be expelled through the jet flushing means, substantially as described.

10. A trapped water-closet and urinal receptacle, provided with a jet flushing means and an upper or rim flushing means and a main supply-conduit therefor normally filled with air and divided above the normal level of water in said receptacle into two water-sealed conduits one of which supplies said jet flushing means and the other conduit being trapped to maintain water at a higher level than the normal water-level in said receptacle and leading to the rim flushing means, substantially as and for the purpose described.

11. A water-closet or urinal-receptacle or the like, provided with a jet flushing means, a rim flushing means and a supply therefor from which lead two separate trapped or water-sealed conduits of unequal depths of seal, the conduit having least depth of seal leading to the jet flushing means, and the conduit having greatest depth of seal leading to the

rim flushing means, whereby any air in the supply meeting less resistance in the trap or seal of least depth will be discharged through the jet flushing means, substantially as described.

12. A water-closet or urinal or the like, having a receiving hopper or bowl, a flushing means therefor and a trapped outlet-passage therefrom, a part of the upleg of said passage forming the trap being contracted or of less cross-sectional area than the part of the passage beyond it, whereby any substance which passes through said contracted part cannot choke the passage beyond it, substantially as described.

13. A water-closet or urinal or the like, provided with a hopper or bowl a rim or upper flushing means therefor, a trapped siphon outlet-passage from said hopper a part of the leg of said passage forming the trap being contracted or of less cross-sectional area than the part of the passage beyond it, and a jet flushing means discharging into said siphon-passage beyond its contracted or smallest part substantially as and for the purpose described.

14. A water-closet or urinal or the like, provided with a receiving hopper or bowl a rim or upper flushing means therefor a supply for said rim flushing means, a trapped outlet-passage from said hopper, a portion of the part of said passage forming the trap being contracted or of less cross-sectional area than the part of the trap or passage beyond it, a submerged jet flushing means discharging into said upleg beyond its contracted or smallest part and a supply-conduit leading to said jet flushing means substantially as and for the purpose described.

15. A water-closet or urinal or the like, provided with a receiving hopper or bowl a rim

or upper flushing means therefor, a trapped outlet-passage from said hopper, a portion of the part of said passage forming the trap being contracted or of less cross-sectional area than the part of the trap or passage beyond it, a submerged jet flushing means located above the level of the bottom of said hopper-outlet and discharging upwardly into said upleg through the wall thereof, whereby any substance which can pass through said contracted space will not obstruct the passage beyond it and the noise of the jet and air discharge will be muffled by the wall between the hopper and its trapped outlet-passage, substantially as described.

16. A water-closet or urinal or the like, provided with a receiving hopper or bowl a rim or upper flushing means therefor, a trapped outlet-passage from said hopper having the offset or ledge I formed in substantially the lower wall of said passage above the highest point of inlet thereto and the jet-pipe O discharging from said ledge, whereby the contents of the hopper passing across said ledge and the line of jet-discharge will be driven up over the trap, substantially as described.

17. The combination of hopper A provided with a suitable rim flushing means, trapped outlet-passage E F, jet-pipe O discharging into said passage above the inlet thereto, trapped supply-conduit R leading directly to said jet-pipe and having the opening N below said jet, and a supply-conduit to said rim flushing means which is trapped to a greater depth than the jet-supply conduit, substantially as and for the purpose described.

SAML. WALKER LEWIS.

Witnesses:

ROBT. STEVENSON,
ARTHUR J. BARRETT.

It is hereby certified that in Letters Patent No. 555,455, granted February 25, 1896, upon the application of Samuel Walker Lewis, of Brooklyn, New York, for an improvement in "Water Closets and Urinals," an error appears in the printed specification requiring correction as follows: In line 128, page 3, the comma after the word "means" should be stricken out, and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 17th day of March, A. D. 1896.

[SEAL.]

JNO. M. REYNOLDS,
Assistant Secretary of the Interior.

Countersigned:

JOHN S. SEYMOUR,
Commissioner of Patents.