(No Model.) 2 Sheets—Sheet 1.

S. H. WRIGHT.

APPARATUS FOR FLUSHING URINALS, &c.

No. 401,321. Patented Apr. 9, 1889.

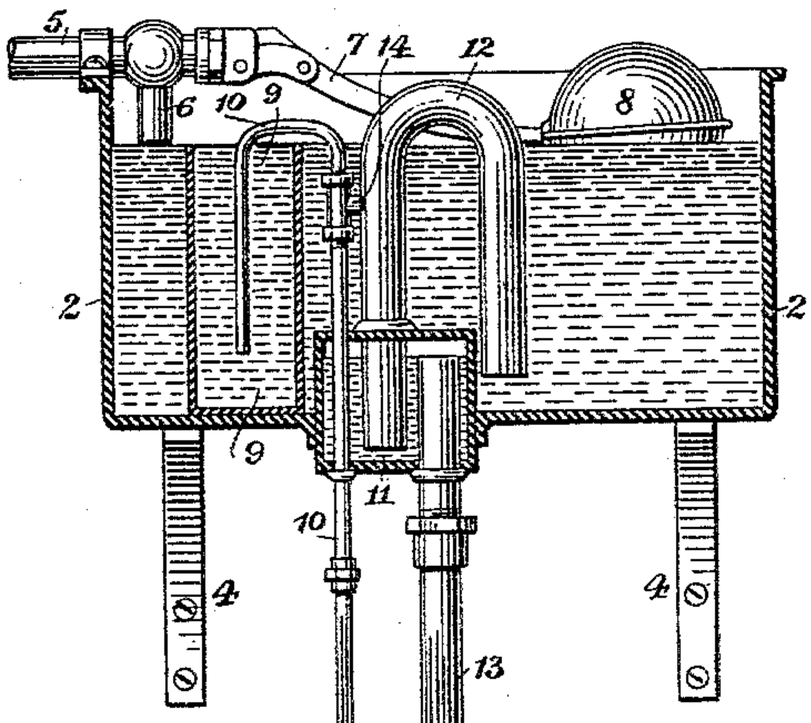


Fig. 1.

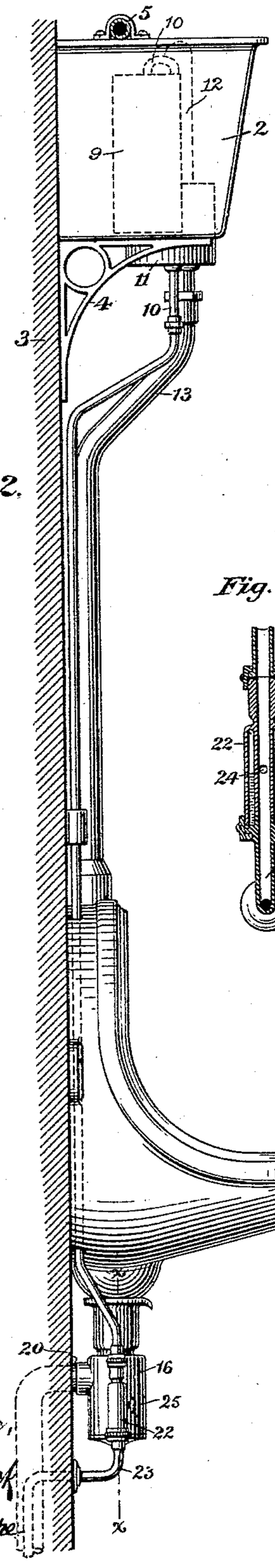
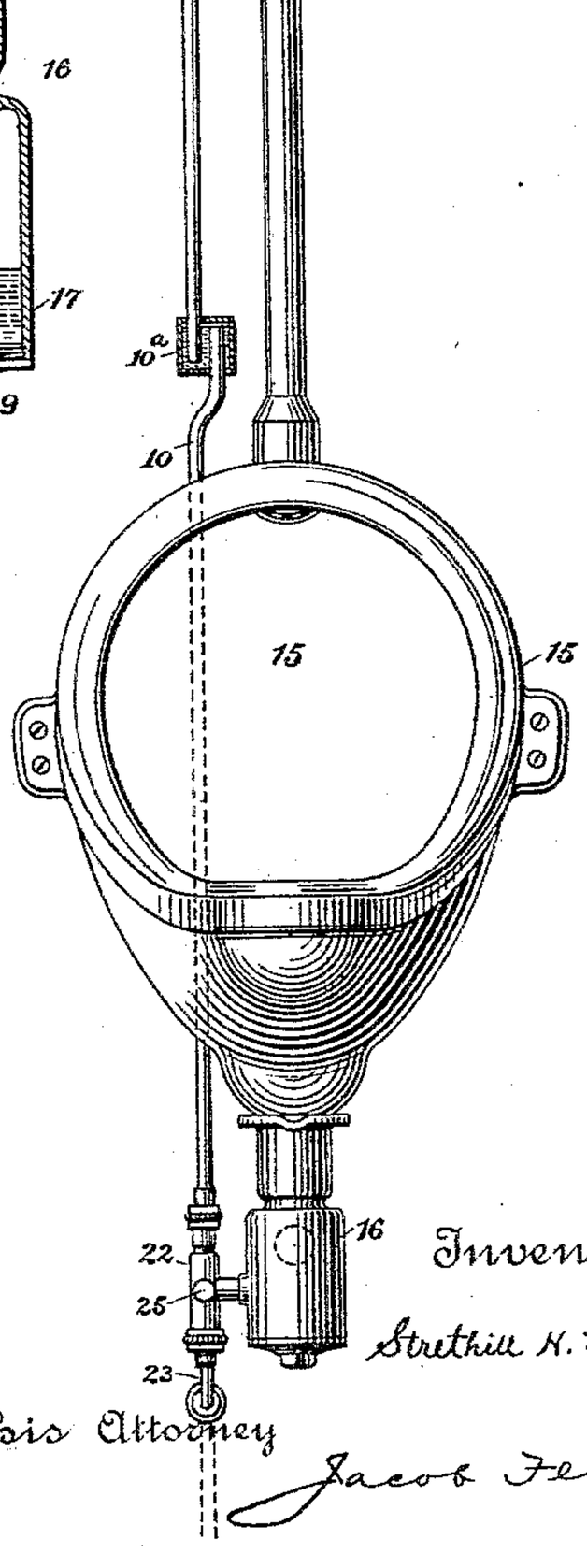


Fig. 2.

Fig. 3.



Witnesses,
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Edward Thorpe

Inventor.
Strethill N. Wright
By his Attorney
Jacob Felbel

(No Model.) 2 Sheets—Sheet 2.

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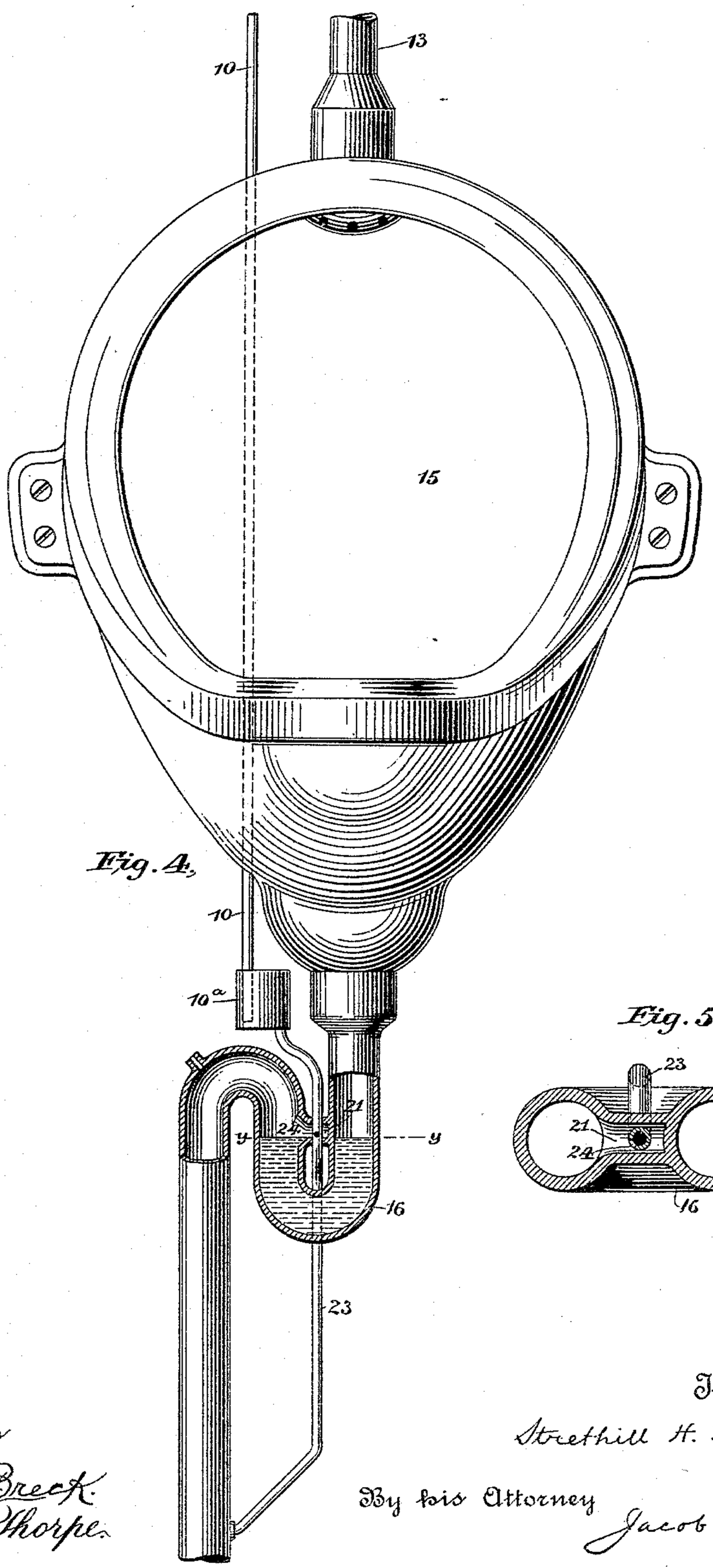

Fig. 4.

Fig. 5.

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UNITED STATES PATENT OFFICE.

STRETHILL H. WRIGHT, OF BIRKENHEAD, COUNTY OF CHESTER, ENGLAND, ASSIGNOR TO THE MEYER-SNIFFEN COMPANY, (LIMITED,) OF NEW YORK, N. Y.

APPARATUS FOR FLUSHING URINALS, &c.

SPECIFICATION forming part of Letters Patent No. 401,321, dated April 9, 1889.

Application filed August 8, 1888. Serial No. 282,245. (No model.) Patented in England January 26, 1887, No. 1,223; in France November 10, 1887, No. 186,900, and in Belgium November 12, 1887, No. 79,524.

To all whom it may concern:

Be it known that I, STRETHILL HARRY WRIGHT, a subject of the Queen of England, and a resident of Birkenhead, in the county of Chester, England, have invented certain new and useful Improvements in Apparatus for Flushing Urinals, &c., of which the following is a specification.

My invention has for its main object to provide an apparatus for flushing urinals and similar vessels, which may be set in operation by the mere act of voiding the urine into the pan or basin; and it consists in the features of construction and combinations and arrangements of parts hereinafter more fully described, and particularly set forth in the appended claims.

My present invention is based on the discovery or invention patented to me in Great Britain, October 29, 1885, No. 13,018, the principle of which may be stated to be that if a regulated volume of water be permitted to flow "part bore" down a pipe communicating with a space or chamber, rarefaction of the air in such space or chamber will be effected to a degree and with a rapidity dependent upon the charge of water which said pipe receives less than its full-bore capacity and the perpendicularity of its fall.

In the drawings accompanying this specification and forming a part thereof, Figure 1 is a front view of an apparatus embodying my invention, the tank or cistern being shown in section. Fig. 2 is a side elevation of the same. Fig. 3 is an enlarged vertical section taken at the line $x\,x$ of Fig. 2. Fig. 4 is a front view of a modification of my invention, and Fig. 5 is a horizontal section taken at the line $y\,y$ of Fig. 4.

In the several views the same part will be found designated by the same numeral of reference.

2 designates a flushing tank or cistern, which may be secured to or supported against a wall, 3, by arms or brackets 4.

5 designates the usual supply-pipe; 6, the supply-cock; 7, the float-lever, and 8 the ball-float.

Within the tank or cistern is provided a cup or well, 9, into which is introduced the shorter leg of a small-bore siphon, 10. An opening is preferably made in the bottom of the cistern for the insertion and securement of a box-like trap, 11, the lower end of which preferably extends or projects beneath the bottom of the cistern. The longer leg of a large-bore flushing-siphon, 12, is fitted within the box or receptacle 11, as is also the upper end of a flushing-pipe, 13, (which may be said to be a continuation of said siphon,) the mouth of the former being located at near the bottom of the box and that of the latter at near the top thereof. The shorter limb of the flushing-siphon 12 is arranged within the main part of the cistern with its mouth preferably slightly below that of the shorter leg of the siphon 10. Preferably the bend of the siphon 10 is placed below that of siphon 12, in order that the exhaust action in siphon 10 may hasten and assist the action of siphon 12. These siphons may, however, be differently arranged; but I have obtained the best results by the relative arrangement described. The siphons 10 and 12 communicate with each other by means of a coupling, 14.

The bore of siphon 10 is preferably smaller at that portion above the coupling, so as to give a part-bore charge to the down-pipe portion. A trap, 10^a, is preferably connected to the down-pipe 10, to prevent the escape of sewer-gas by way of the cistern when emptied.

The lower end of the flushing-pipe 13 is connected in any suitable manner with a urinal pan or basin, 15, which may be supported as shown or otherwise.

Beneath the pan or basin 15 and in open communication therewith is a trap-like contrivance, 16, made, preferably, in one piece and consisting of an inverted cup-like portion, 17, and a pipe-like portion, 18, extending down to near the bottom of the inverted cup-like portion or chamber 17, which is threaded at its lower end and provided with a trap-screw, 19, that forms a bottom to said chamber.

At the rear side of the trap 16 is connected

a waste-pipe, 20, which may, if desired, be connected to a suitable soil or drain pipe. Below the point or locality at which the waste-pipe connects with the trap is a lateral branch or passage-way, 21, leading from the trap into a chamber, 22, formed or provided with a draw or exhaust pipe or passage, 23, whose upper end is connected to the longer leg of the siphon 10, and whose lower end may be connected to the waste or to the soil pipe at any suitable or convenient locality. That portion of said draw pipe or tube which is located within the chamber 22 is provided with an orifice or inlet, 24, of less capacity than the draw-pipe, to regulate the admission of the liquid from the trap and insure a part-bore discharge thereof into the draw-pipe. The chamber 22 is preferably formed with an opening in line with said orifice to obtain access thereto for cleaning purposes, a screw, 25, or other device being provided to keep said opening closed at all other times.

The operation of the apparatus may be described as follows: Assuming the tank and the well to contain their full supplies of water and the traps 11 and 16 and the chamber 22 to be filled to the levels indicated by the dotted lines at Figs. 1 and 3, immediately the urine is voided or passed into the pan or basin it descends through the pipe 18 into the standing liquid in the trap and displaces an equal bulk or quantity, which is forced through the lateral branch or passage-way 21 into the chamber 22. As the liquid in said chamber rises, a regulated quantity passes through the orifice 24 into the draw-pipe, which, being larger in internal diameter or bore than the orifice or inlet, can receive only a part-bore charge—in other words, the draw-pipe will be supplied with a quantity of liquid less than it is capable of conducting or discharging. As soon as liquid begins to descend in said draw-pipe, it carries with it the air in the siphons 10 and 12, and when sufficient air has thus been exhausted the water in the well and in the tank will be caused to rise within the siphons, and the flushing action of the urinal will ensue. The water which is drawn over the bend of the smaller siphon, 10, first will descend through the long leg of siphon 10 and assist in drawing the water over the bend of the larger siphon, 12, which falls into the trap 11 and, forcing out the contents thereof, overflows into the flushing-pipe 13, by which it is conducted full bore to the pan or basin of the urinal to cleanse the same in the usual manner. From the basin the flushing-water discharges rapidly and in large volume into the trap 16, filling the same up to mouth of the waste-pipe into which it enters and passes off to the drain or sewer connections, a small portion of such flushing-water at same time passing off by way of the lateral branch, the chamber, and the draw-pipe. While the siphons are discharging and the water in the tank is being withdrawn the ball-float descends, gradually opening the supply-cock 6 and admitting a fresh supply of water. When the water in the well 9 shall have been exhausted to the mouth of the siphon 10, air will be admitted to said siphon and to the siphon 12 through the connection 14, thus destroying the power of said siphons and checking or interrupting the flushing action. So soon as siphonage ceases, the tank begins to fill again, and when the water has reached the level indicated at Fig. 1, and a portion of it has flowed over into the well and filled it, the supply to the tank is automatically cut off by the action of the float.

The object of the employment of the well or cup is to insure the stoppage of the flushing action, after the flushing-siphon has been "broken," until such time as urine is again voided into the pan or basin. If the well were not employed, the incoming water might close the mouth of the siphon 10 before the contents of the longer leg of said siphon or the contents of the draw-pipe had fully escaped, and thus reactuate the siphons and repeat the flushing operation. By the use of the well and filling it by an overflow from the tank the siphons are left unsealed a longer time and for a sufficient period to permit the escape of all the fluid in motion and the apparatus to resume its normal condition.

Immediately the water overflows into the well the shorter leg of the siphon 10 becomes sealed, and the flushing-siphon 12, being always sealed at its extremities, air will be confined within said siphons and will start or actuate the same again when rarefied or exhausted by means of the liquid flowing part bore down the draw-pipe.

In the modification shown at Figs. 4 and 5 the trap 16 is provided with a lateral passage-way, 21, which communicates with the draw-pipe 23 by means of an opening, 24, in the latter of less capacity or bore than that of the draw-pipe, so as to assure the giving of a part-bore charge. The operation of the modified construction is substantially the same as that of the construction hereinbefore described. The urine voided into the pan will descend into the trap and force a portion of its standing water into the draw-pipe, which descending part bore therein will set in action the siphons 10 and 12 in the manner before explained and cause the pan to be flushed or washed out.

It will be seen that by my invention is provided means for automatically flushing urinals by the mere act of micturition on the part of the user, thus dispensing with the usual cocks or valves and other appliances provided for giving a constant or periodic automatic flush at all times, (which is wasteful and often unnecessary when the urinal is not in actual use,) and also dispensing with all contrivances intended to be actuated by the hand or foot of the user, upon whom, it may be said, little reliance can be placed.

The apparatus, it will be understood, is ca-

pable of many changes in detail construction and in the general arrangement of its parts; and hence I do not wish my invention to be considered as limited to just what is shown and described. An apparatus such as herein shown has been constructed and is now in successful operation.

The means herein described for exhausting the air by the part-bore flow of the liquid and setting in operation the flushing-siphon I designate a "part-bore-exhausting" contrivance or apparatus, and this may be modified, if desired, as described in my aforesaid English patent.

The draw-pipe may be seven thirty-seconds of an inch bore and the orifice or inlet thereto five thirty-seconds of an inch in diameter, thus insuring a part-bore charge to the draw-pipe.

It will be understood, of course, that the flushing action of the cistern may be obtained, when desired, by simply pouring a small quantity of water into the basin or pan.

In some modifications of my invention, where all of the results attained by the structure shown are not desired, the traps, the smaller siphon, the well, and other parts may be omitted without departing from the spirit of my invention, the gist of which will now be set forth in the annexed clauses of the claim.

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

1. The combination of a cistern, a urinal, a flushing-siphon, and a part-bore draw-pipe connecting with the urinal-outlet and with the flushing-siphon, substantially as described.

2. The combination of a cistern provided with two siphons communicating with each other, a urinal, and a part-bore draw-pipe connecting with the urinal-outlet and with the siphons, substantially as described.

3. The combination of a cistern provided with communicating siphons 10 and 12, the bend of the former being arranged below that of the latter, a urinal, and a draw-pipe connecting with the urinal-outlet and with the siphons, substantially as described.

4. The combination of a cistern provided with communicating siphons 10 and 12, the siphon 10 having a smaller bore above the point of connection with the siphon 12, a urinal, and a draw-pipe connecting with the urinal-outlet and with the siphons, substantially as described.

5. The combination of a cistern, two siphons connecting with each other, a well for one of the siphons, a urinal, and a draw-pipe connecting with the urinal and with the siphons, substantially as described.

6. The combination of a cistern, a flushing-siphon, a ball-cock, a urinal, and a part-bore draw-pipe connecting with the urinal-outlet and with the flushing-siphon, substantially as described.

7. The combination of a cistern, two siphons connecting with each other, a ball-cock, a well for one of said siphons, a urinal, and a draw-pipe connecting with the urinal and with the siphons, substantially as described.

8. The combination of a cistern, two siphons communicating with each other, a well for one of said siphons and a trap for the other, a supply-cock, a urinal, and a draw-pipe connecting with the urinal and with the siphons, substantially as described.

9. The combination of a cistern, two siphons communicating with each other, a well for one of said siphons and a trap for the other, a supply-cock, a pan or basin, a trap beneath the same, and a draw-pipe connecting with the urinal and with the siphons, substantially as described.

10. The combination of a cistern, two siphons communicating with each other, a well for one of said siphons and a trap for the other, a supply-cock, a draw-pipe, a pan or basin, and a trap beneath the same having two outlets, one to the draw-pipe and the other to the waste-pipe, substantially as described.

11. The combination of a cistern, two siphons communicating with each other, a well for one and a trap for the other, a supply-cock, a pan or basin, a trap beneath the same, and a part-bore-exhausting apparatus consisting of a draw-pipe, a surrounding chamber, and an inlet from the chamber to the draw-pipe.

12. The combination of a cistern, two siphons, 10 and 12, therein connecting with each other, a well for the siphon 10, a draw-pipe, and a supply-cock to the cistern, substantially as described.

13. The combination of a cistern, two siphons, 10 and 12, the shorter leg of the latter extending below that of the former, a well for the short leg of the siphon 10, a trap for the long leg of the siphon 12, a draw-pipe, and a supply-cock to the cistern, substantially as set forth.

14. The combination of a cistern, a flushing-siphon, a draw-pipe connected therewith, a urinal, a trap beneath the same, a waste-pipe from the trap, and a passage-way from the trap to the draw-pipe, substantially as described.

Signed at Liverpool, in the county of Lancaster, England, this 9th day of July, A. D. 1888.

STRETHILL H. WRIGHT.

Witnesses:

J. B. EMMONDS,

A. WALLACE.