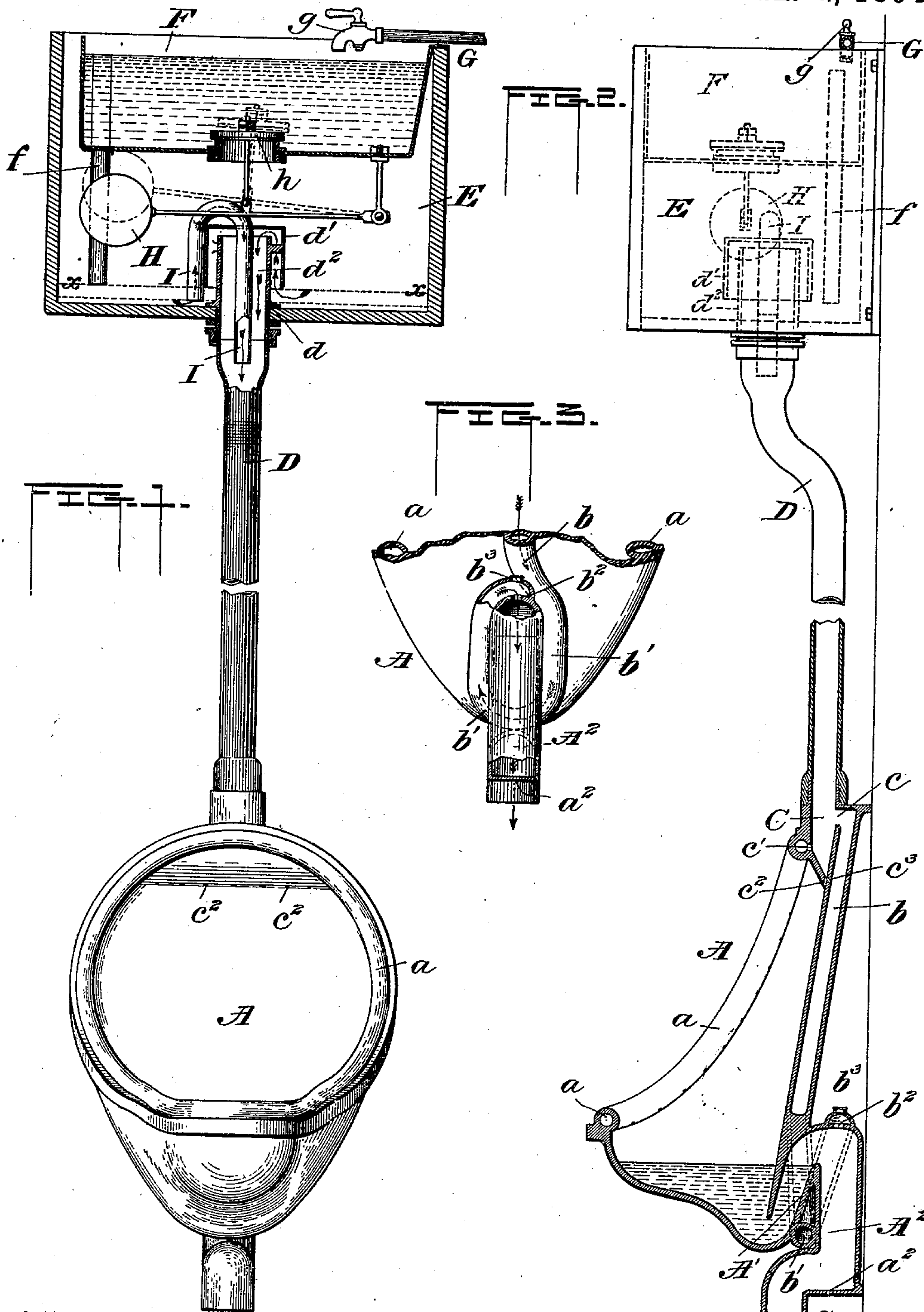


(No Model.)

F. WALLACE.  
URINAL.

No. 512,592.

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# UNITED STATES PATENT OFFICE.

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## URINAL.

SPECIFICATION forming part of Letters Patent No. 512,592, dated January 9, 1894.

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*To all whom it may concern:*

Be it known that I, FRANK WALLACE, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Urinals; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to water closet apparatus, but more particularly to urinals in which a discharge siphon is employed for the purpose of effecting a forcible withdrawal of the contents of the bowl at certain predetermined intervals.

In apparatus of this character heretofore in use employing a so-called siphon discharge the action of the apparatus, instead of being truly siphonic, is such as may be more properly termed a "washout," and is subject to objection on account of the quantity of water required to effect a complete evacuation of the contents of the bowl, and also on account of the difficulty experienced in maintaining a water seal to prevent the escape of sewer gas into the room or building.

The primary object of my invention is to provide efficient means for siphoning out the urinal at intervals and refilling the same, so as to form a perfect and reliable water seal after each evacuation of the bowl, and thereby exclude sewer gas and other foul odors issuing from the sewer pipes.

A further object is to provide means for automatically effecting a discharge from a service tank into a receiving and distributing chamber, and to distribute the water from said chamber so as to effectually discharge the contents of the bowl by siphonic action and subsequently refill the bowl and traps to the desired depth to form a reliable water seal.

With these and other objects in view, the invention consists in certain improved features of construction and combinations of parts all as will be hereinafter more fully described and then particularly pointed out in the claims at the end of this description.

In the accompanying drawings, which form a part of this specification and in which similar letters of reference are used to denote

similar parts, Figure 1 represents a front elevation of an apparatus embodying my invention, the flushing tank being shown in section so as to more clearly illustrate the construction. Fig. 2 represents a side elevation of the same with the urinal proper in section; and Fig. 3 is a detail partly in section looking at the rear of the lower portion of the bowl.

A, denotes the urinal proper the bowl of which may be formed with an inclined flushing rim  $a$ , and with a passage  $b$ , in the rear wall thereof, communicating with the loop  $b'$ , of the jet pipe. At its upper end the passage or pipe  $b$ , communicates with a distributing chamber C, through a port  $c$ ; said chamber being located at the junction of the bowl with the supply pipe D. A port  $c'$ , arranged slightly below the port  $c$ , leads into the flushing rim  $a$ . The capacity of the port  $c$ , is considerably in excess of that of the port  $c'$ , and the bottom of the chamber C, is depressed or inclined downwardly from the front toward the rear wall of the bowl as shown, and perforated as at  $c^2$ ,  $c^2$ , for a purpose to be described. The loop  $b'$ , at the lower end of the passage  $b$ , of the jet pipe, passes underneath the neck of the discharge siphon and thence upwardly to the dome thereof so as to discharge a jet into the long leg of the siphon through a jet orifice  $b^2$ . Above the orifice  $b^2$ , is placed a screw cap  $b^3$ , to permit access to said orifice.

A', denotes the short leg of the discharge siphon and A<sup>2</sup>, the long leg thereof, the latter terminating in a right angled bend so as to provide an impact surface  $a^2$ , substantially at right angles to the direction of the jet descending said leg.

The action of the apparatus as thus far described is as follows:—When the flow from the flushing tank begins, the water rushing down the pipe D, will be abruptly checked by the distributing chamber C, from which a portion of the water will pass down the rear wall of the bowl, through the small perforations  $c^2$ , and through the port  $c'$ , so as to supply the flushing rim, while the main portion passes through the larger port  $c$ , and thence to the dome of the siphon, discharging a jet into the long leg thereof. This jet will drive the air from said leg and create a vacuum therein so as to start the siphon, and by the



splashing of the water caused by striking the impact surface at  $a^2$ , a seal will be formed which will prevent the return of the air until the contents of the bowl have been withdrawn and the siphonic action ceases. At this point, the refilling action begins and is accomplished by means of a greatly reduced supply from the service tank, as will be described, descending in such quantity as to readily pass to the bowl through the port  $c'$ , and small perforations  $c^2$ , without accumulating to such an extent as to rise to the level of the port  $c$ . The latter port is thus prevented from carrying off and thereby wasting water at this stage of the operation, when no siphonic action of the urinal is desired. But it may be found expedient in some cases, to puncture a small hole leading to the pipe  $b$ , as at  $c^3$ , for the purpose of renewing any portion of the seal in the trap or loop  $b'$ , which may be siphoned out by the action of the large siphon of the urinal, but owing to the depth of the trap this is hardly ever necessary.

The urinal as thus constructed may be used in connection with a flushing tank of any desired form, or with tanks such as are ordinarily employed in this class of apparatus. A preferred form, however, is illustrated in the drawings, wherein E, denotes the service tank having in the upper part thereof a tray or receiver F, which is provided with an overflow pipe  $f$ , the lower end of which terminates a short distance above the bottom of the tank E.

G, denotes a supply pipe which is provided with a regulating valve or cock  $g$  by which the supply of water to the receiver may be controlled so as to cause the latter to discharge its entire contents at regular intervals of time.

H, denotes a pivoted float which is connected to the stem of an upwardly opening disk or other suitable valve  $h$ , in the bottom of the receiver. The supply pipe D, connects at its upper end with a pipe section  $d$ , which projects up into the tank E, for a suitable distance and has an inverted cup-piece or cap  $d'$ , placed over the opening thereof with its lower edge or rim supported slightly above the bottom of the tank E, for the purpose of forming a siphon-discharge.

I, denotes a small siphon tube, the long limb of which depends through the cap  $d'$ , into the upper end of the supply pipe D, while the shorter limb is raised slightly above the bottom of the tank E, but on a lower level than the intake of the larger siphon  $d^2$ .

The operation is as follows:—The receiver or tray F, being filled to the depth indicated in Fig. 1, the water therein will flow down the pipe  $f$ , and gradually rising in the tank E, will raise the float H, which, being connected with the valve  $h$ , will lift said valve from its seat, and thereupon the contents of the receiver will descend to the lower tank, submerging and thereby bringing the siphons I, and  $d^2$ , into action. This action will con-

tinue until the contents of both tank and receiver are emptied, with the effect already described in respect to the urinal proper. The siphonic action set up in the urinal will continue until the water in the tank E, falls below the intake of the siphon  $d^2$ , as indicated by the dotted lines  $x-x$  in Fig. 1, whereupon said siphon will cease to act and the operation in the urinal will also cease, except the refilling process, which now begins. The refilling is accomplished by means of the small siphon I, which continues to operate after the larger siphon has stopped; its intake being on a lower level than the intake of the larger siphon. The water remaining in the tank is delivered by the smaller siphon in a greatly reduced volume and descending slowly to the distributing chamber is readily carried off through the small perforations  $c^2$ , and the port  $c'$ , leading to the flushing rim on a lower level than the port leading to the siphon-discharge, and the latter port is thereby prevented from carrying off and wasting the water. The trap in the bottom of the bowl is thus re-filled with clean water to the depth indicated in Fig. 2, so as to form a perfect water seal which will prevent sewer gas and other unwholesome odors rising in the discharge pipe, from entering the room or building. A similar water seal will also be formed in the loop  $b'$ , of the pipe  $b$ , by the water remaining in the loop. But in the event of siphoning out the water in the latter trap by the action of the urinal, any portion of the seal thus broken may be renewed through the perforation  $c^3$ , leading from the distributing chamber to the pipe  $b$ , as described.

A plurality of urinals of the described construction may be so connected with a flushing tank of the necessary capacity as to flush the entire combination at each operation; a main supply pipe connecting with the flushing tank being provided with a series of branches leading to the respective urinals.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination with the bowl provided with an inclined flushing rim and the supply pipe leading thereto, of a distributing chamber located at the junction of the supply pipe and bowl, and provided with discharge ports of different sizes leading into the jet pipe and flushing rim and located one above the other; the lower and smaller port discharging into the flushing rim, a jet pipe located behind the rear wall of the bowl and communicating with the distributing chamber through the larger port of the latter above said smaller port, and a siphon discharge pipe the long leg of which communicates with said jet pipe, so as to discharge a jet directly into said leg, whereby a siphonic action is insured and the refilling of the bowl is accomplished after such action ceases, substantially as described.

2. The combination with the bowl provided with an inclined flushing rim and the supply



pipe leading thereto, of a distributing chamber located at the junction of the supply pipe and bowl, and provided with ports of different sizes leading into the jet pipe and flushing rim and located one above the other; the lower and smaller port discharging into the flushing rim, a jet pipe located behind the rear wall of the bowl and communicating with the distributing chamber through the larger port of the latter above said smaller port, and a siphon discharge pipe the long leg of which communicates with said jet pipe, so as to discharge a jet directly into said leg; said discharge chamber having bottom perforations leading into said jet pipe and bowl, whereby the refilling and sealing of the traps of the siphon are insured, substantially as described.

3. In combination with the bowl having the

siphon discharge and inclined flushing rim, the single supply pipe communicating with said bowl, the distributing chamber located at the junction of said supply pipe and bowl and communicating with said rim and with a passage leading to said siphon discharge, and the tank and means for automatically controlling the discharge therefrom into said single supply pipe, consisting essentially of the main and refilling siphons, the reservoir with overflow and suitable valve therein, and the float adapted to raise said valve, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK WALLACE.

Witnesses:

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TENNEY ROSS.