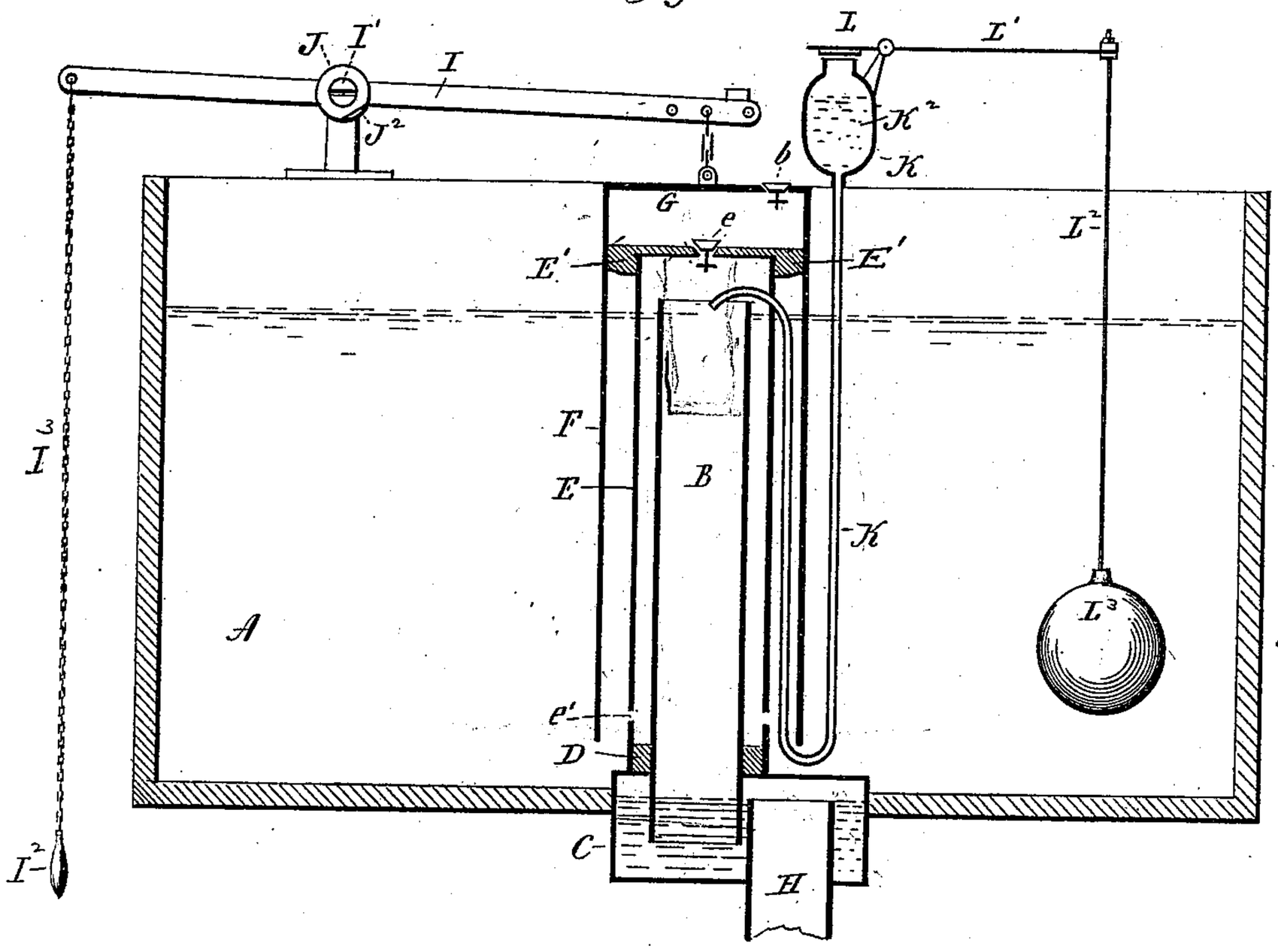
(No Model.) 2 Sheets—Sheet 1.

R. MORGAN & J. MENZIES.

SIPHON FOR WATER CLOSETS.

No. 488,794. Patented Dec. 27, 1892.

Fig. 1.



Witnesses.
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(No Model.) 2 Sheets—Sheet 2.

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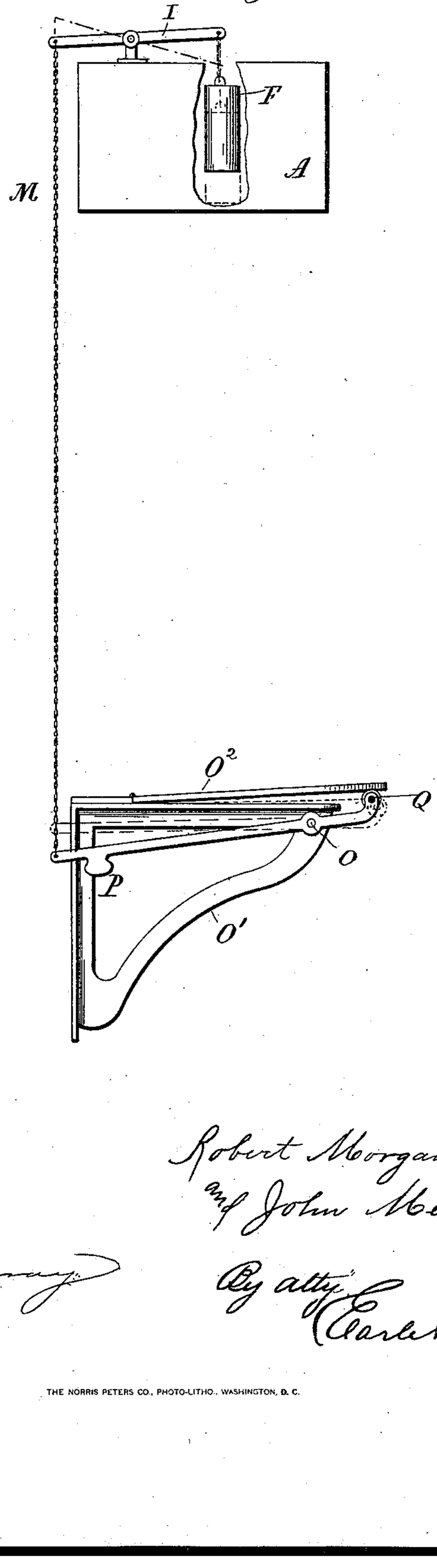
Fig. 2



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UNITED STATES PATENT OFFICE.

ROBERT MORGAN AND JOHN MENZIES, OF NEW HAVEN, CONNECTICUT.

SIPHON FOR WATER-CLOSETS.

SPECIFICATION forming part of Letters Patent No. 488,794, dated December 27, 1892.

Application filed July 25, 1892. Serial No. 441,142. (No model.)

To all whom it may concern:

Be it known that we, ROBERT MORGAN and JOHN MENZIES, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Siphons for Water-Closets; and we do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1 a view partly in elevation and partly in vertical section of a siphon and tank constructed in accordance with our invention and showing also our improved noiseless after-fill attachment, and Fig. 2, a view showing our improved siphon as connected with the closet-seat for operation thereby.

Our invention relates to an improvement in siphons primarily designed for water-closets, but also applicable for use in other situations, the object being to produce a simple, effective and durable siphon in which there is no opening in the bottom of the tank in which it is located, but only at a point above the level of the water therein when the same is filled, whereby leakage from the tank is made impossible. A further object of our invention is to combine with such a siphon a noiseless attachment for after-filling.

With these ends in view, our invention consists in certain details of construction and combinations of parts as will be hereinafter described and pointed out in the claims.

Herein we have described the invention as applied to a water-closet. The tank A is of ordinary construction, and filled by a supply-cock, controlled by a float-ball, neither of which are shown herein.

Our improved siphon comprises in part an inner pipe B, extending at its upper end just above the level of the water in the tank when the same is filled, and extending at its lower end through the bottom of the tank into a trap C, the said pipe being secured in a fixed position by being screwed into a centrally perforated head D, consisting as shown of a casting secured to the bottom of the tank, with which, however, it may be made integral when the same is of cast iron. This pipe A has the functions of the long leg of an ordinary siphon. An outer pipe E, set over the pipe B, and enough longer than the same to form an annular space between them, is secured at its lower end to the said casting D, and extended at its upper end above the upper end of the said pipe B, its upper end being provided with a cap E′, screwed onto it, and furnished with a vertically movable check-valve *e*, in its upper face. This pipe E, which corresponds to the short leg of an ordinary siphon, is closed at its lower end, which, however, is provided with a series of inlet-openings *e′*. The cap E′ which is screwed onto the upper end of the pipe E, is adapted in size and construction to form a joint between its edge and the inner wall of a cylindrical plunger F, closed at its upper end, which is furnished with a vertically movable valve *b*, the lower end of the said plunger extending downward almost to the bottom of the pipe E. The joint formed between the cap E′ and the plunger F need only be tight enough to effect sufficient rarefication of the air in the pipe B to so far reduce the pressure therein below the pressure of the atmosphere upon the water in the tank as to start the siphon. A vacuum chamber G, is thus formed between the closed upper end of the plunger and the upper face of the cap E′. A flush-pipe H leading to the water-closet extends into the trap C, before mentioned. As herein shown, the plunger is raised and lowered by means of a lever I, pivoted in a bearing I′, and having a handle I^2, connected with it by a cord I^3. As herein shown, that object is attained by fixing to the lever a disk J, having a square face which engages with an incline J^2 formed upon the bearing I′.

With such a siphon as described, we employ a noiseless after-fill attachment, operating on the principle of the device described in the application filed by us June 20, 1892 and serially numbered 437,306 for an improvement in water-closets. As herein shown this device has a long air pipe K, connected at one end to the air-retarding chamber K′, and passing vertically downward therefrom, thence passing under the lower edge of the plunger F, and upward between the same and the outer pipe E, and through an opening formed there-

in just under the cap B′, and terminating over the upper end of the inner pipe B. The air-retarding chamber K, is filled with a body of retarding material K^2, which may be powdered charcoal, quartz, or a fibrous substance, or anything that will break up and retard the passage of air through the chamber. As herein shown the chamber is provided at its upper end with a hinged valve L, having a stem L′, connected by a float-stem L^2, with a float L^3. When the float is employed the valve L, will be opened to admit air into the air-retarding chamber F, when the water has been drawn off to a predetermined level, but if desired the float and valve may be dispensed with and the air allowed to pass into the air-retarding chamber all of the time, the idea being in that case that the air will pass through the chamber so gradually that it will not break the siphon until the same has accomplished its work. When the hollow plunger is operated by means of a handle I^2, the plunger is normally in its depressed condition, as shown. Now if the handle be pulled and the plunger momentarily lifted, such a rarefication of the air in the vacuum chamber will take place that the valve *e* in the cap E′ will open, and permit some of the air in the pipe B, which is sealed at its lower end by its immersion in the trap C, to be drawn up into the vacuum chamber, whereby the pressure of the atmosphere is so much less within the pipe B, than upon the surface of the water in the tank, that the siphon will be at once started, the water passing into the pipe E, through the perforations *e′* therein, and raising and flowing over the top of the pipe B, and thence through the same into the trap C, from which it overflows into the flush pipe H. The discharge of water thus set in motion will continue until sufficient air is supplied to the pipe B, through the air-pipe K to break the siphon. During the operation of the siphon as thus described, the valve *e* in the cap E′ will be kept closed by the downward suction of air.

It will be understood that to start the siphon it is only necessary to lift the plunger momentarily by the handle I^2, which is then let go, whereby the plunger is allowed to settle back to its original position, the valve *b* in its upper end at such time opening to allow the escape of surplus air.

In case our improved device is not operated by a handle, as shown, but by the closet-seat and devices applied thereto, the normal condition of the plunger will be reversed or lifted. Then when the seat is pressed down the plunger will be allowed to take its depressed position in which it is shown in the drawings, and which is its normal position when the handle and pull are employed. Then when the seat is relieved of pressure, the plunger is lifted, with the effect of rarefying the air in the vacuum chamber, and thus starting the siphon as before described. Such an arrangement is shown by Fig. 2 of the drawings, in which the lever I, is connected by a wire M, with an operating-lever N, hung near its outer end on a pivot O, to the bracket O′ of the closet-seat O^2, and having its inner end furnished with a weight P, and its outer end provided with an anti-friction roller Q, upon which the said closet-seat rests. In this figure the full lines show the normal position of the plunger F, while the broken lines show the depressed position it takes when there is pressure on the seat. This figure is not designed to show the entire mechanism, but only to illustrate the point in question.

Our improved after-fill attachment breaks the siphon so gradually that the sucking noise generally occurring when siphons are broken is reduced to a mere whiff, as fully described in our application on file as above referred to. We would therefore have it understood that we do not limit ourselves to the exact construction herein shown and described, but hold ourselves at liberty to make such changes and alterations therein as fairly fall within the spirit and scope of our invention.

Having fully described our invention, what we claim as new and desire to secure by Letters Patent is:—

The combination with a vertically movable cylindrical plunger having its lower end open, and its upper end closed, and provided with an air-valve; of a fixed outer pipe inclosed by the said plunger, having its lower end closed and provided with inlet openings, a cap applied to the upper end of the said pipe, made larger than the same to form a joint with the plunger and provided with an air-valve; a fixed inner pipe located within the said outer pipe than which it is smaller, and extending above the level of the water in the tank when the same is filled; a trap into which the lower end of the inner pipe extends, a flush pipe leading from the said trap, an air-pipe leading into the space between the upper ends of the outer and inner pipes, and means of controlling the passage of air through the said air-pipe, substantially as described, and whereby the air in the inner pipe is rarefied for starting the siphon by raising the plunger.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

ROBERT MORGAN.
JOHN MENZIES.

Witnesses:
FRED. C. EARLE,
GEO. D. SEYMOUR.