

W. M. & J. SMEATON.
Water-Closet Valve Mechanism.
No. 222,088. Patented Nov. 25, 1879.

Fig. 2.

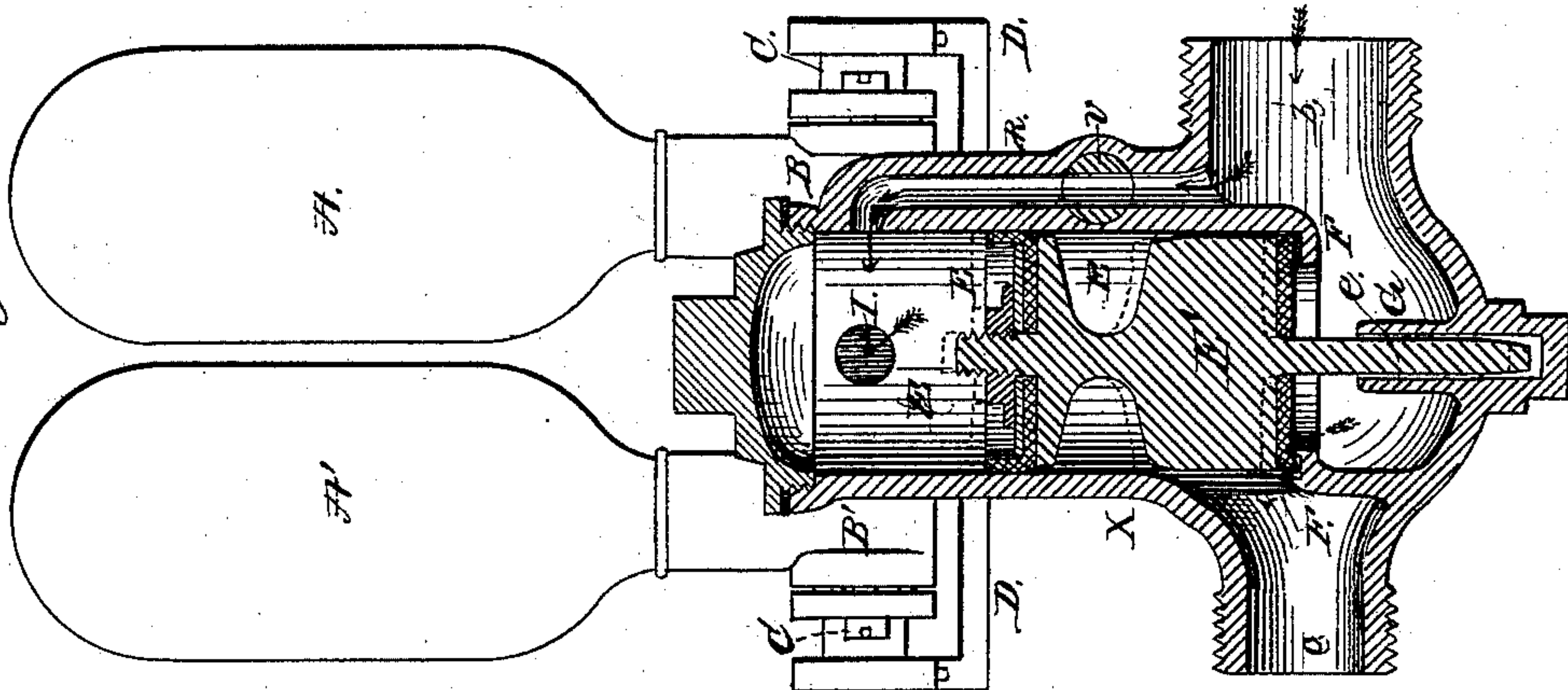
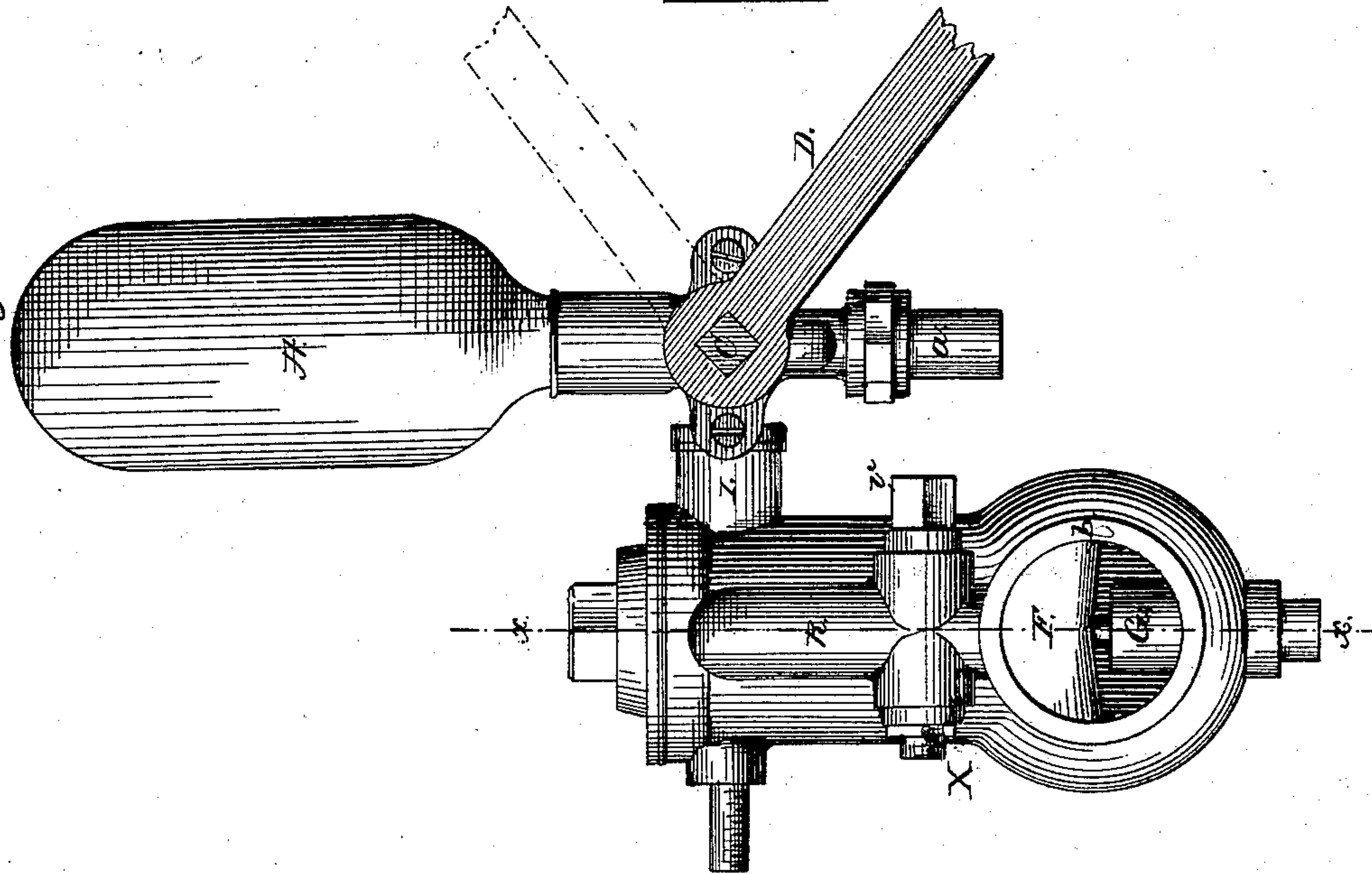


Fig. 1.



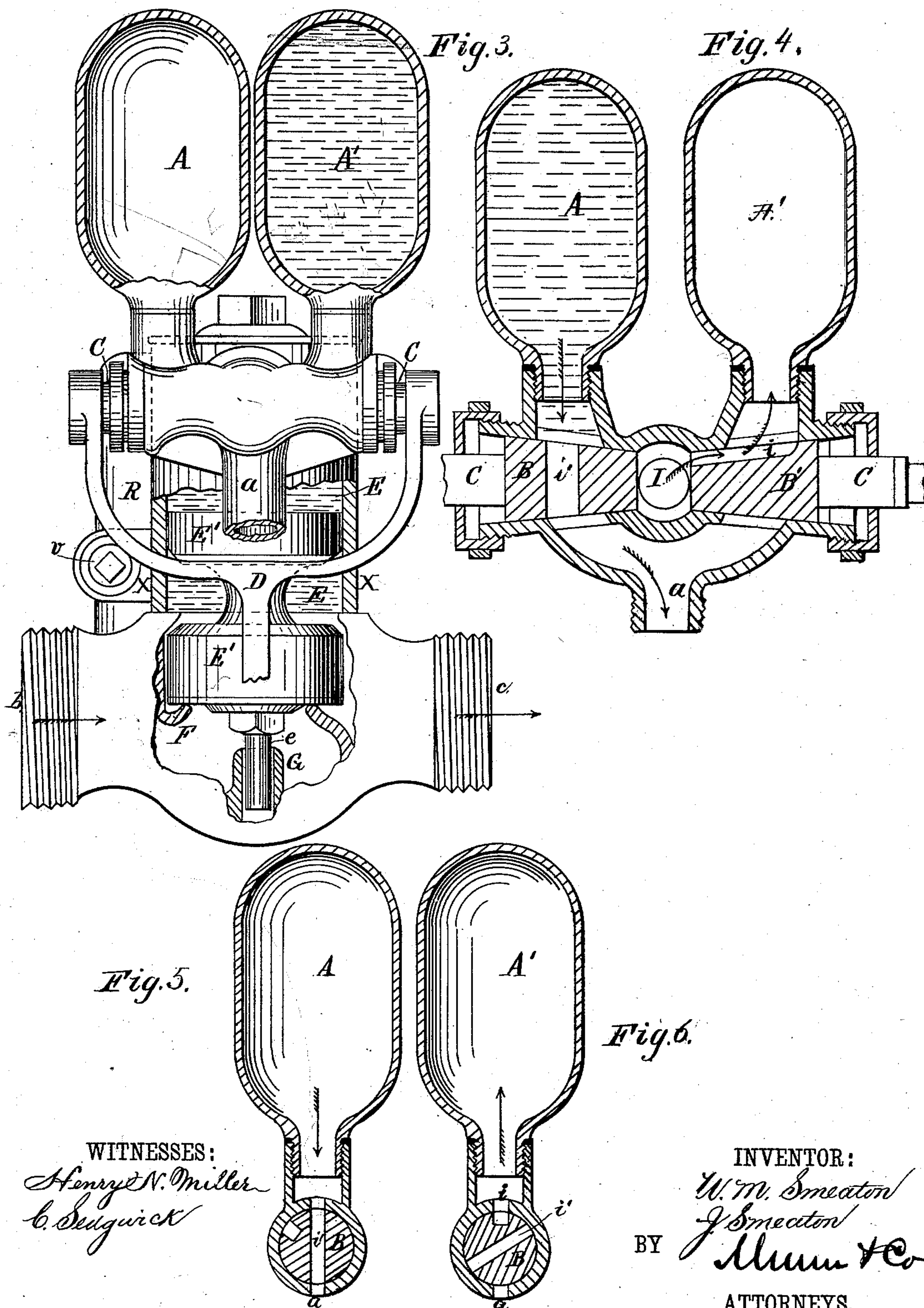
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WILLIAM M. SMEATON AND JOHN SMEATON, OF NEWCASTLE STREET,
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IMPROVEMENT IN WATER-CLOSET VALVE MECHANISMS.

Specification forming part of Letters Patent No. 222,088, dated November 25, 1879; application filed July 9, 1879.

To all whom it may concern:

Be it known that we, WILLIAM M. SMEATON and JOHN SMEATON, of Newcastle street, Strand, Middlesex county, England, have invented a new and useful Improvement in Water-Closet Valve Mechanisms; and we do hereby declare that the following is a full, clear, and exact description of the same.

Our invention relates to improved valve mechanism, adapted to be brought into operation by a pull or handle for the purpose of regulating the amount and preventing the waste of the water supplied to the bowl of a water-closet, to flush and cleanse it during or subsequent to use.

The principal feature of the invention consists in utilizing hydrostatic pressure to control the action of the main valve, upon which the admission of water for flushing the bowl depends. In other words, we connect with the chamber of such main valve two small supplementary water-chambers, one of which is full or being filled when the other is empty or discharging. The weight of the water in one of said supplementary chambers is normally on the main or flushing valve when the handle or lever of the valve mechanism is depressed. But when the said lever is raised for the purpose of flushing the closet-bowl the main valve is relieved of such weight, and the water from the supply-pipe being also simultaneously set in motion to fill the supplementary chamber, which is empty, the impetus or momentum of the water, acting freely on the under side of the valve, but not on its upper side, overcomes its gravity and inertia, and momentarily raises it, so that a sufficient quantity of water passes into pipe *c* to flush the bowl. The valve then slowly closes as the previously-empty supplementary chamber fills and again comes to rest on its seat, thus cutting off the discharge into the bowl. When the handle or valve-lever is forced down the valve again rises and the bowl is flushed as before.

We show in accompanying drawings, forming part of this specification, different views of the valve mechanism, a closet-bowl and

water-supply pipe being omitted, since their connection with and arrangement in relation to such mechanism will be well understood from the description following.

Figure 1 is a side elevation of the valve mechanism. Fig. 2 is a rear sectional elevation on line *xx*, Fig. 1. Fig. 3 is a rear elevation with parts broken away. Fig. 4 is a vertical central section of the supplementary water-chambers and their valves. Figs. 5 and 6 are vertical sections of the two chambers in planes at right angles to the plane of section in Fig. 4.

X indicates the shell or case of the main or flushing valve *E'*, and *b c* the respective induction and eduction water-ways, to which the supply and discharge pipes (not shown) are in practice to be attached. The supplementary water-chambers *A A* are placed above or higher than the valve-case X, and connected with the upper portion thereof by means of a tube, *I*, having lateral and pendent tubular extensions, as shown in Figs. 3 and 4. The induction and eduction of chambers *A* and *A'* are controlled by tapered valves or plugs *B B'*, respectively, Fig. 4. Each of said valves has a longitudinal induction-passage, *i*, and a transverse eduction-passage, *i'*. The valves *B B'* are rotated (within the limits of a quarter of a circle) by means of a bifurcated lever, *D*, whose arms are attached to the spindles *C* of the respective valves, so that both are operated simultaneously by raising or depressing said lever.

The valves are placed with their passages *i i'* in such relation to each other that when the induction-passage *i* of one valve *B* (or *B'*) is open, the like passage of the other will be closed and its eduction-passage *i'* open, as shown in Fig. 4, and vice versa, so that one chamber, *A'*, may be filling while the other, *A*, is discharging. When the valve mechanism is not in action, the pressure of the weight of water in the supplementary chamber *A*, which is filled, is on the main valve *E'*, since there is then open communication between the two valve-chambers through tube *I* and one of the valves *B*.

The main valve E' is constructed with two heads, the upper one being packed to adapt it to fit the shell X closely, and the other constituting the part which rests normally on the valve-seat F. A stem, e, projects from the lower part of the valve and enters a socket, G, for the purpose of guiding and steadying the valve in its vertical movements.

One side of the valve-case X has a tubular enlargement, R, (Figs. 1 and 2,) by which communication is established between the induction-pipe or water-way b and the upper portion of the valve-chamber E. This passage R is always open, but the ingress of water to chamber E from the supply-pipe b is limited or controlled by means of a cock, v.

To put said mechanism in condition for operation, the water-supply pipe proper is attached at b and the bowl-pipe at c, and a small pipe leading to the bowl is attached at a, Fig. 4. The arm or lever D is also weighted, and the pull of the water-closet is provided with a lug or projecting part (not shown) that takes under said lever, so that when the pull is drawn up the lever will be raised, as shown in dotted lines, Fig. 1. At that time one of the supplementary chambers, A', is empty, and the other, A, is in communication through its passage i and the tube I with the main valve-chamber E. The raising of the lever D rotates both valves B B', and opens the discharge-passage i' of one valve, B, and induction-passage i of the other valve, B'. Thus, communication is cut off between the chamber A and valve-chamber E, and opened between the latter and a supplementary chamber, A', at the same instant. Hence, the valve E' is relieved of the pressure of the weight of water in one supplementary chamber, A, and a current is simultaneously set up from supply-pipe at b, through passage R, tube I, and valve B', to fill the empty chamber A'. Such current sets the whole body of water in the supply-pipe in motion, and suddenly increases the pressure on the lower side of the valve E' at the moment the weight of water in the filled chamber A is removed from it; and thus the gravity of the main valve is overcome by the impetus or momentum of the water flowing along the supply-pipe. The valve remains

elevated a moment, and the bowl thus receives its first flush, but the empty chamber A' being soon filled, the pressure on the upper side of the valve E' is restored, and hence the gravity of the latter carries it down to its seat again. The depression of the lever D, however, produces a second operation precisely like that above described—that is to say, the contents of the now filled supplementary chamber, A', are discharged and the other chamber, A, is opened and filled from supply-pipe b, so that the main valve E' is again relieved of pressure and rises as before, thus giving the after-flush.

It will be understood that the contents of the supplementary chambers A A' discharge through the pipe attached at a into the bowl of the water-closet, preliminary to the flushing of the same, and thus assist in rendering the latter operation effective for its purpose.

What we claim is—

1. In a valve mechanism for water-closets, the combination with the main or flushing valve that is closed by the water-pressure of supplementary water-chambers and valves therefor, which allow said chambers to be alternately filled and discharged, and a passage leading from the supply to that part of the main-valve chamber which is above the valve, and a lever adapted to be operated by the pull of the water-closet, substantially as shown and described, whereby the main valve is momentarily opened upon removal of the pressure of the water contained in one of the supplementary-chambers, as specified.

2. The combination of the bifurcated lever D, valves B B', having induction and eduction passages, the tube I, main valve E' and case X, the side passage R, having valve v, and the induction and eduction water-ways b c, substantially as shown and described, to operate as specified.

The above specification signed by us.

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