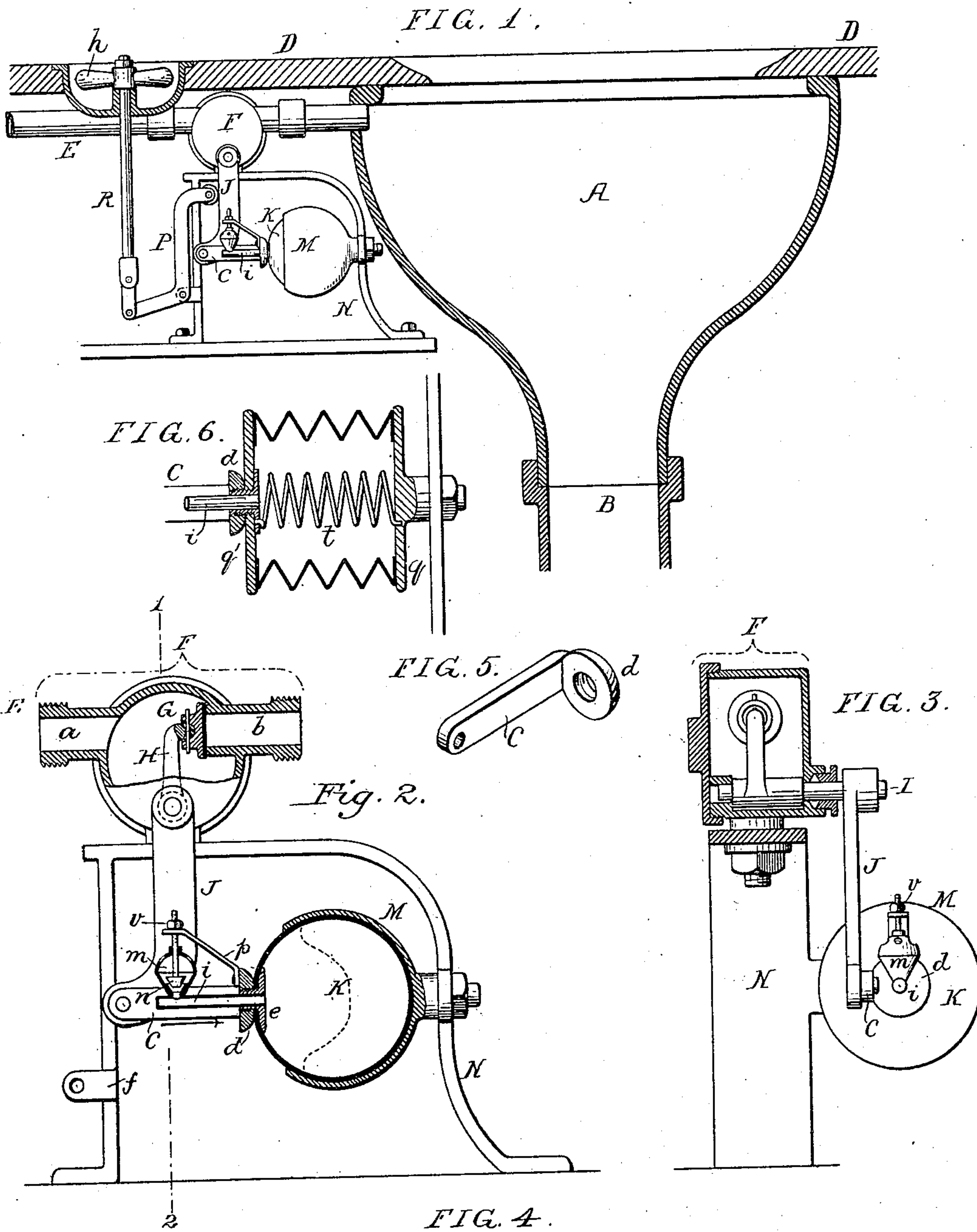


(Model.)

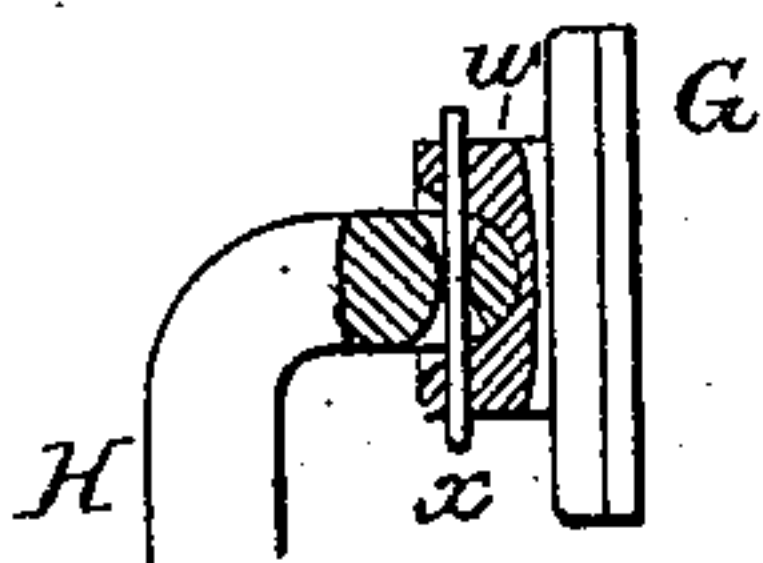
J. H. SPENCER.

Mechanism for Operating the Valves of Water Closets.
No. 238,453. Patented March 1, 1881.



Witnesses:

Harry Smith
James F. Tobin.



Inventor:
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UNITED STATES PATENT OFFICE.

JAMES H. SPENCER, OF PHILADELPHIA, PENNSYLVANIA.

MECHANISM FOR OPERATING THE VALVES OF WATER-CLOSETS.

SPECIFICATION forming part of Letters Patent No. 238,453, dated March 1, 1881.

Application filed December 20, 1880. (Model.)

To all whom it may concern:

Be it known that I, JAMES H. SPENCER, M. D., a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Mechanism for Operating the Valves of Water-Closets, of which the following is a specification.

My invention consists of mechanism, fully described hereinafter, for the purpose of admitting water to the basins of water-closets, and especially for causing a delay in the closing of the valve for thus admitting the water after the said valve has been released.

In the accompanying drawings, Figure 1 is a vertical section of a water-closet casing and seat, and an exterior view of my improved apparatus; Fig. 2, an enlarged view, partly in section, of valve-chest, valve, air-receptacle, and appliances connected therewith; Fig. 3, a vertical section on the line 1 2, Fig. 2; Fig. 4, part of Fig. 2 drawn to an enlarged scale; Fig. 5, a detached view of another part of Fig. 2, and Fig. 6 a modified form of air-receptacle.

A represents the usual basin of the water-closet, B part of the soil-pipe, D the seat, and E the pipe through which water is admitted to the basin. The continuity of this pipe is interrupted by a valve-chest, F, Fig. 2, having an inlet-branch, *a*, and outlet-branch, *b*, the latter projecting into the interior of the chest, and its end serving as a seat for the valve G, which is loosely connected, in the manner explained hereinafter, to the upper end of an arm, H, secured to the valve-spindle I, which is mainly contained within the chest, but a portion of which projects through a stuffing-box on the same. To this projecting portion of the spindle is secured an arm, J, connected at its lower end to a rod, C, on which, between a projection, *d*, and a washer, *e*, is confined a portion of the hollow elastic sphere K, of rubber, the greater portion of the latter being contained within a metallic cup, which is made in the form of a hollow segment of a sphere, to accord with the hollow elastic sphere, and which is secured to a frame, N.

It may be here remarked that the entire apparatus is self-contained, the valve-chest, cup, and all the appliances connected therewith being carried by the frame N, so that the applicability of my invention to any water-closet may be facilitated.

To a projection, *f*, on the frame is pivoted a bell-crank lever, P, the long arm of which carries a roller for bearing against the arm J of the valve-spindle, the short arm of the lever being connected to a rod, R, which is furnished at the top with a handle, *h*, located in the usual position for manipulation. A tube, *i*, secured to the washer *e*, forms a communication between the interior of the hollow elastic sphere and a small valve-chest, *m*, which contains a valve, *n*, the spindle of the latter being preferably suspended from an arm, *p*, by means of nut *v*, by turning which the valve may be brought nearer to or farther from its seat, the said arm *p* being carried by the rod C. On raising the rod R the bell-crank lever P, acting on the arm J, will so move the latter as to open the valve G, and at the same time force the rod C in the direction of the arrow, thereby compressing the hollow elastic sphere K, as shown by dotted lines, Fig. 2. A portion of the air will thus be expelled from the sphere K through the tube *i* and through the perforations at the top of the small valve-chest *m*. As soon as the rod R is released the elastic hollow sphere will attempt to resume its former expanded condition; but this effort is retarded by the contracted passage between the valve *n* and its seat, through which passage a limited supply of air enters the sphere, and during the time which elapses between the releasing of the rod R and the recovery by the sphere of its normal condition the valve G will be more or less open, and the flow of water into the basin will continue. The time during which this flow of water is continued will depend upon the adjustment of the valve *n*. The nearer it is to its seat the longer will be the time taken for the sphere to recover its normal condition and the longer will the flow of water into the basin continue.

Instead of serving both as an inlet and discharge tube, the tube *i* may have an inlet of such a size as to insure a reasonable delay in the restoration of the sphere to its normal condition after compression, the sphere K having a separate valved opening through which air can be discharged freely from the sphere, but cannot enter the same.

The manner of connecting the arm H to the valve G will be best understood by reference to Fig. 4, where it will be observed that the

said arm is bent at its upper end, and that the bent end is rounded and fits into a concave recess of a socket, *w*, secured to the back of the valve, a pin, *x*, passing through the socket
 5 and through an orifice in the end of the arm, this orifice being enlarged above and below, so that while the valve is connected to and moves with the arm it will be self-accommodating to its seat.

10 One side of the valve-chest *F* is shown in Fig. 3 of the drawings as being removable, so that access to the valve and its seat may be had by removing the said side or cover.

Other air-receptacles which can be contracted and which are self-expanding will suggest
 15 themselves as substitutes for the hollow elastic sphere. For instance, the bellows-like structure shown in Fig. 6 may be substituted for the hollow elastic sphere, this structure consisting of
 20 a fixed disk, *q*, and movable disk *q'*, against which the rod *C* acts, and to which the tube *i* and its valve-chest are connected, a spring, *t*, tending to force the disk *q'* outward.

I claim as my invention—

25 1. The combination of the water-pipe *E* of a water-closet, a valve-chest, and a valve for permitting and obstructing the flow of water through the said pipe with a self-expanding

air-receptacle having an opening or openings for the reception and expulsion of air, and
 30 with mechanism through the medium of which the valve may be opened and the receptacle contracted by hand, and through which the valve may be closed by automatic expansion
 35 of the said air-receptacle, all substantially as set forth.

2. The combination of the pipe *E*, its valve-chest, and valve with the air-receptacle and intervening mechanism, substantially as described, and with a valve for regulating the
 40 admission of air to the said receptacle, all substantially as specified.

3. The combination of the arm *H*, bent at its upper end, with a valve, *G*, having a socket, *w*, adapted to the rounded end of the arm, and
 45 with a pin, *x*, passing through the socket and through the within-described opening in the arm, all substantially as described.

In testimony whereof I have signed my name to this specification in presence of two sub-
 50 scribing witnesses.

JAS. H. SPENCER.

Witnesses:

HARRY SMITH,
 HUBERT HOWSON.