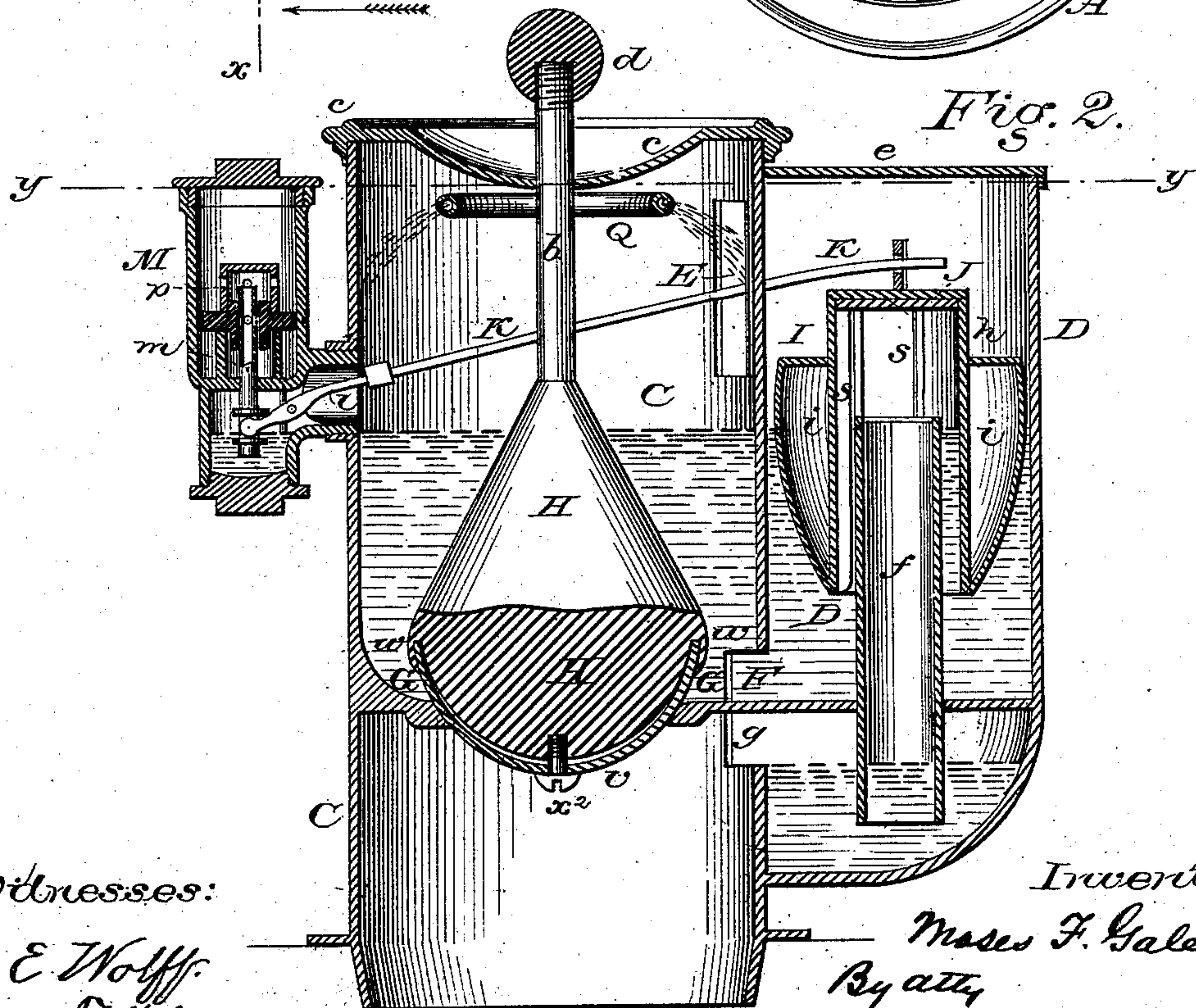
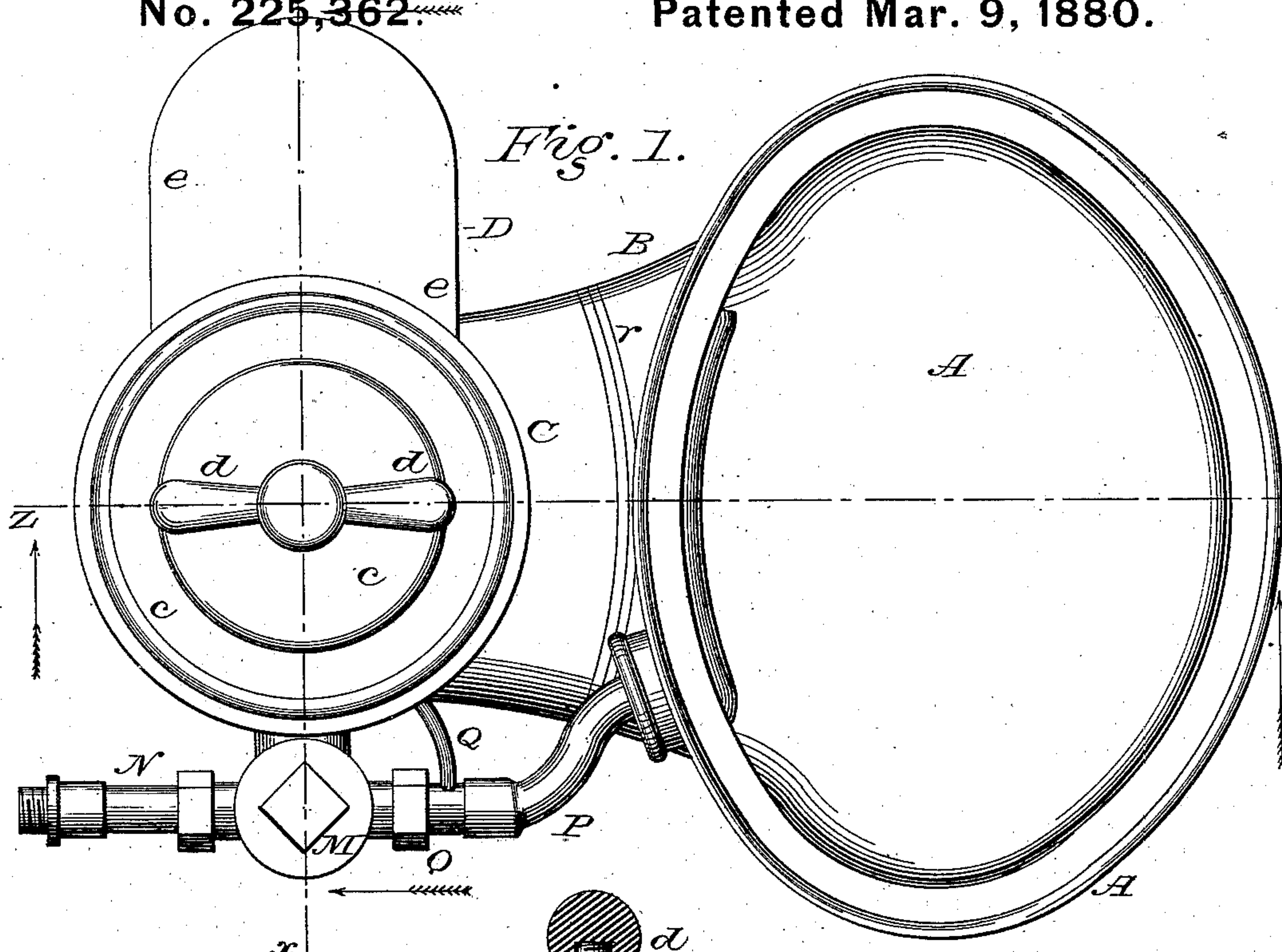


M. F. GALE.  
Water-Closet.

No. 225,362.

Patented Mar. 9, 1880.



Witnesses:

*E. Wolff.*  
*Jacob Felbel.*

Inventor:

*Moses F. Gale*  
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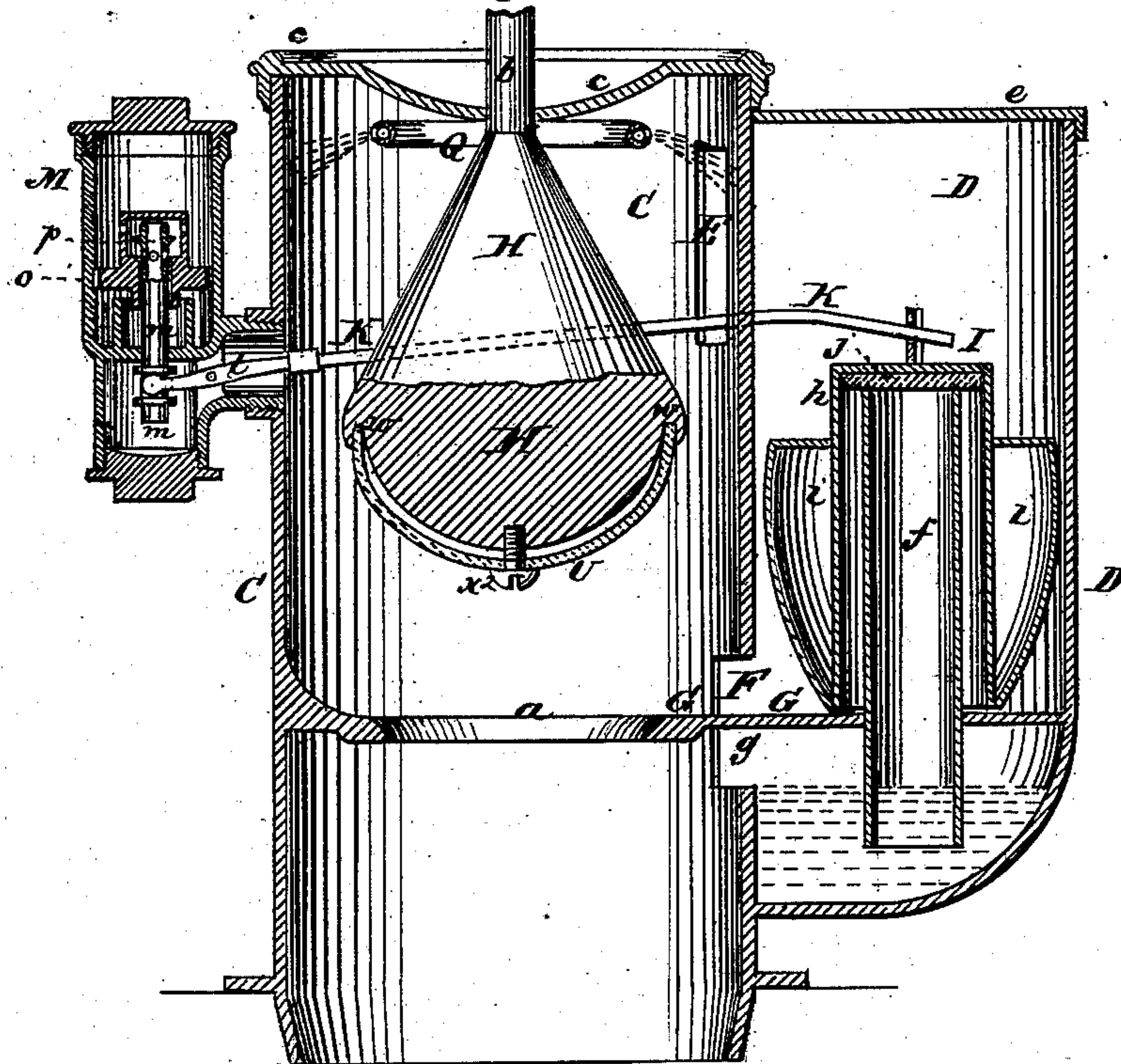


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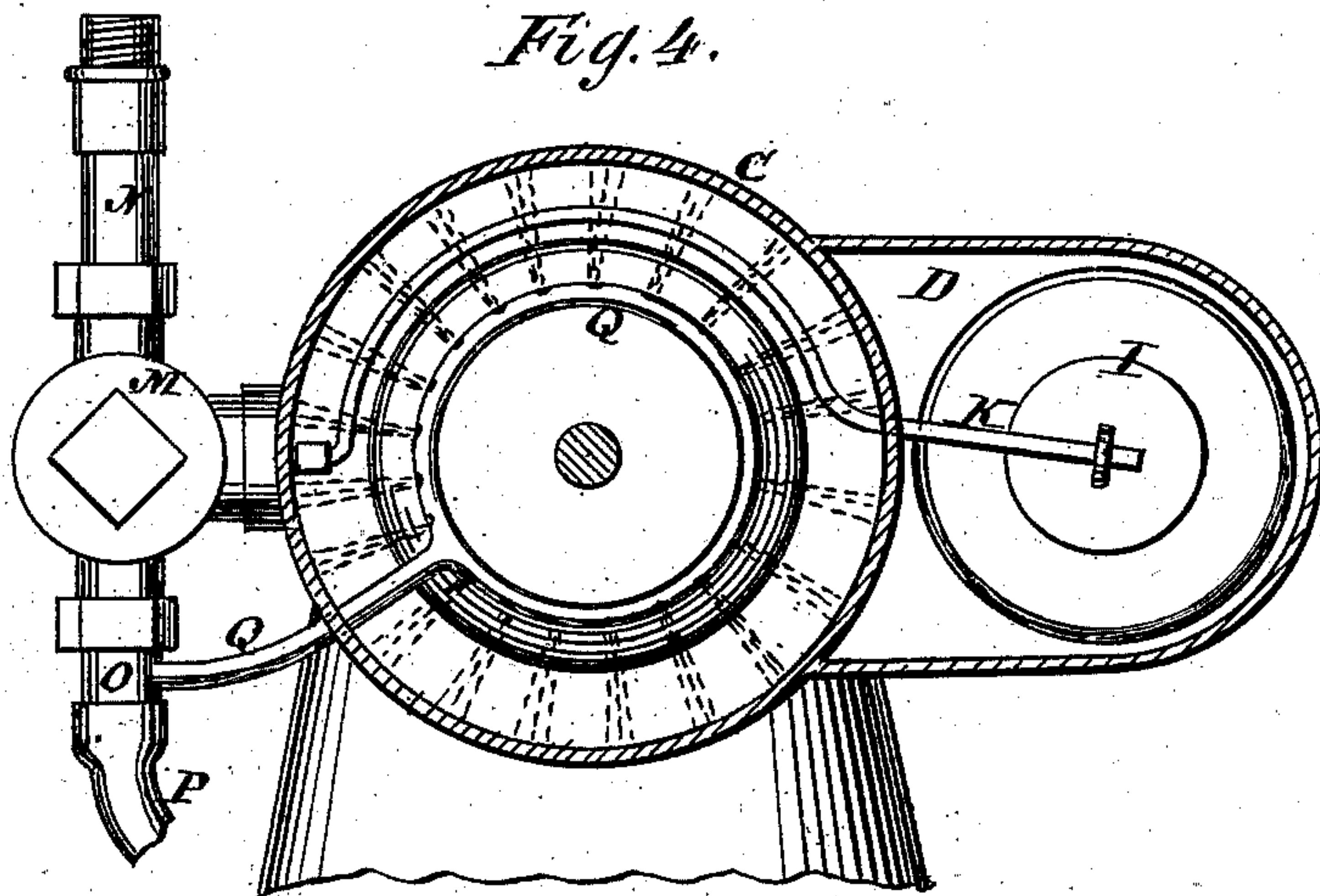
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*Fig. 3.*



*Fig. 4.*



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E. Wolff.  
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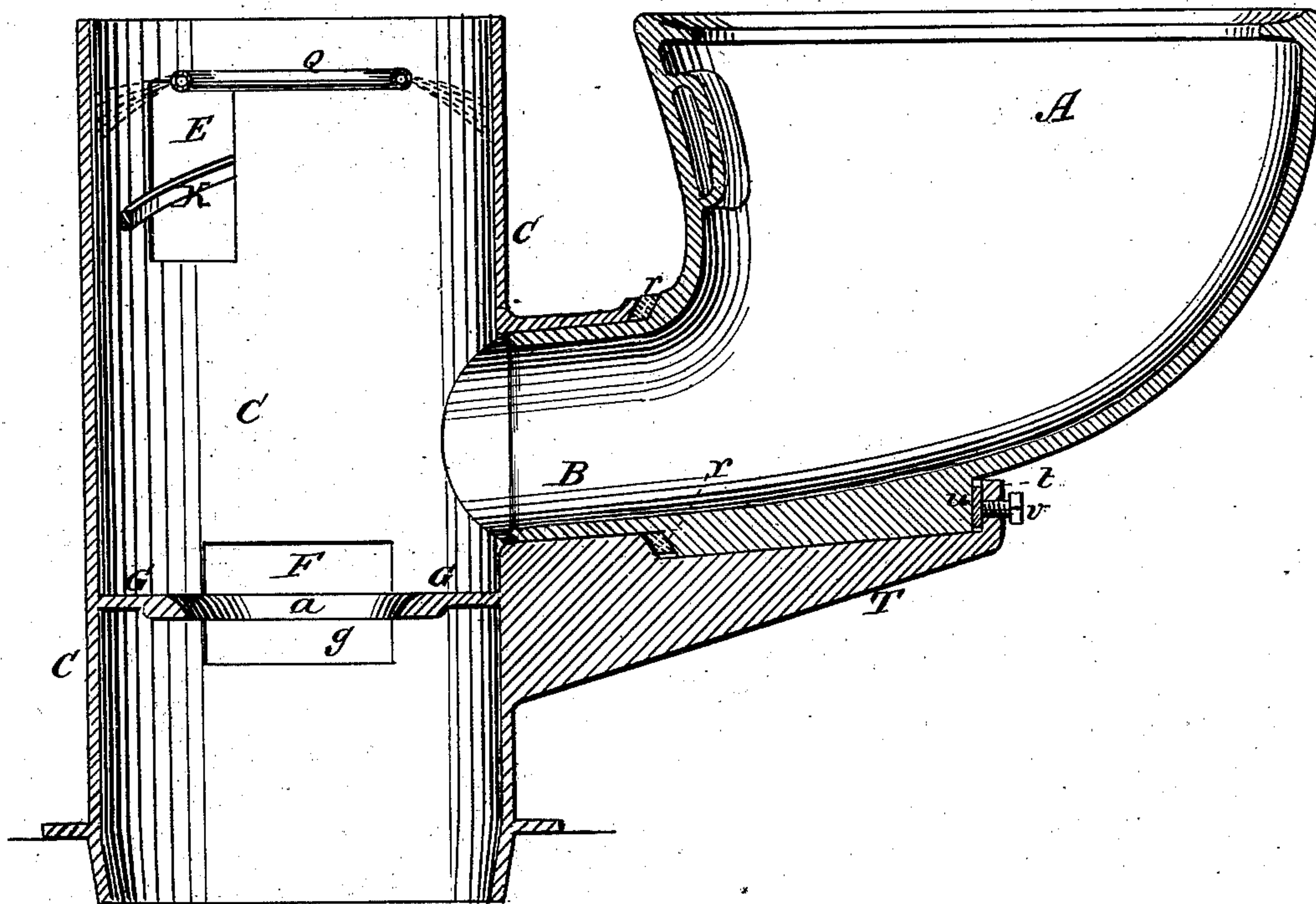
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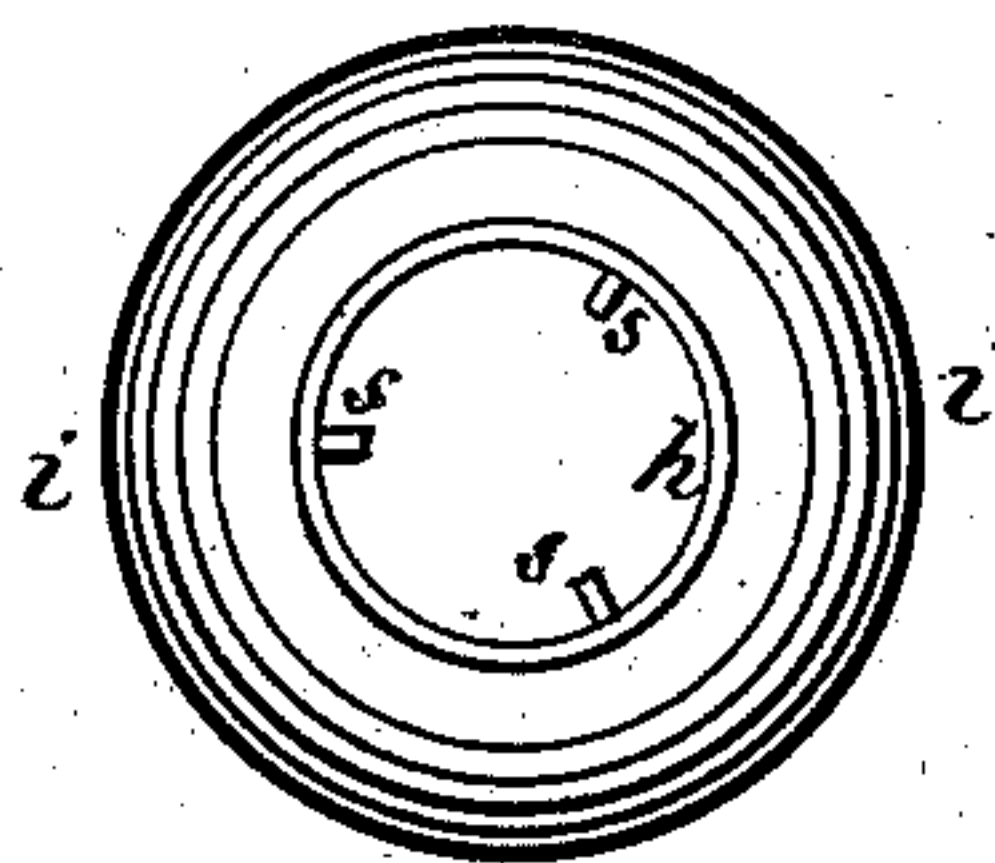
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*Fig. 5.*



*Fig. 6.*



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# UNITED STATES PATENT OFFICE.

MOSES F. GALE, OF BROOKLYN, NEW YORK.

## WATER-CLOSET.

SPECIFICATION forming part of Letters Patent No. 225,362, dated March 9, 1880.

Application filed October 30, 1878.

*To all whom it may concern:*

Be it known that I, MOSES F. GALE, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Water-Closets; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

My invention relates to certain new and useful improvements in that kind of water-closets in which the contents of the bowl are discharged through a side opening communicating, as usual, with the vertical exit or discharge-pipe of the closet.

Previous to my invention closets of this kind have been made in a variety of forms and under various modifications of detail structure; but in all of such contrivances with which I am familiar the constructions have been such as to render the closet more or less defective in practical operation in some one or more particulars, noticeable among which are these, viz: imperfection in the discharge of the bowl's contents; insufficiency in the flushing or after-wash; liability in the course of ordinary use of an escapement into the apartment of sewer-gas; liability to become fouled in some interior portion or portions, and emit bad odors in consequence thereof, and lack of durability in the joint of union between the porcelain or earthen bowl and the metal socket-like portion of the fixture, and a consequent liability, after the closet has been in use some time, of leakage at this point.

To overcome in a great measure or wholly most or all of these defects, and provide a water-closet of the kind mentioned combining in its manufacture and use simplicity and cheapness of structure with durability and perfection of operation, are the main objects of my invention, which, to these ends, consists, first, in the use, in connection with the overflow-pipe or passage-way of the closet, of means for automatically closing up efficiently (or sealing up) such pipe or passage-way in the event of the absence from the closet of the water designed to trap this pipe or passage-way, all as will be hereinafter more fully explained; secondly, in combining the float-like sealing device of the overflow with the water-supply valve of the closet, so that said float-

like device will operate also to perform the usual functions of a float to open and close the water-supply, all as will be hereinafter more fully explained; thirdly, in combining with the two chambers an overflow-pipe extending above and below the floor of one of said chambers and trapped at both of its ends; fourthly, in a novel mode of uniting the bowl and metallic socket-like portion of the apparatus, whereby a greater perfection and durability of union of these parts are effected.

To enable those skilled in the art to make and use my invention, I will now proceed to more fully describe the construction and operation of a water-closet embracing the several features of it, referring by letters to the accompanying drawings, making part of this specification, and in which—

Figure 1 is a top view of such a water-closet; Fig. 2, a vertical section at the line *xx* of Fig. 1, the plane of section being viewed in the direction indicated by the arrow in Fig. 1; Fig. 3, a similar vertical section, but with the discharge-valve and other movable parts in the positions in which they would be at the time of emptying the bowl by the lifting of the pull-up handle; Fig. 4, a partial horizontal section of the apparatus at the line *yy* of Fig. 2; Fig. 5, a vertical section at the line *zz* of Fig. 1, with the discharge valve or plunger removed, and the plane of section viewed in the direction indicated by the arrow at Fig. 1; and Fig. 6, a detail bottom view of the sealing-float device detached from the apparatus.

In the several figures the same part will be found designated by the same letter of reference.

A is the bowl, the downwardly-inclined outlet or pipe-like throat portion of which, B, is united by a closely-packed joint, as will be presently described, to the side opening of the usual vertical limb or portion C of the water-closet, which portion C is supposed, in practice, to be arranged immediately over and to be closely united at its lower end with the upper part of the ordinary siphon-trap of the soil-pipe, in the usual manner.

On one side of the receptacle or upper part of the pipe-like portion C is a sort of auxiliary receptacle, D, communicating therewith at E and at F, for purposes to be presently explained, and beneath the point of communica-



tion between A and C—that is, just below the throat or outlet B of the bowl—is located a horizontal partition or floor, G, which extends across both C and D, and in which is a circular opening, at *a*, through which the contents of the bowl and the communicating receptacles C and D are emptied or discharged when the discharge-valve or plunger H is lifted. This discharge-valve H, as shown, is about hemispherical at its lower portion, from which part it extends upward in about a conical form, and, as seen, is seated, when in its normal condition, in the hole *a* in the floor G, just above referred to. Said discharge-valve is provided with a stem or rod, *b*, which extends upward and through a hole in the top plate or cover, *c*, of the valve-chamber C, and is provided at its upper end with a suitable handle, *d*.

The auxiliary receptacle D is provided also, as shown, with a cover at *e*, and arranged (about centrally) within this receptacle D is a vertical overflow-pipe, *f*, the top or upper end of which is designed to be just about at, or very slightly above, the level at which it is designed to maintain water in the bowl A and receptacles C and D, and the lower portion of which, passing through floor G, (with a tight joint,) is projected downward into that part of receptacle or case D which is located below the said floor G. This lower compartment or portion of case D communicates, through an orifice at *g*, with that part of case C which is below the floor G, and forms a trap to the lower end of the overflow-pipe *f*, as plainly illustrated in the drawings.

Arranged to move up and down over and around the upper part of the overflow-pipe *f* is a float-like device, *l*, composed, as seen, of a thimble-like portion, *h*, provided with vertical guiding-ribs *s*, (to keep it concentric to the pipe *f*,) and with a surrounding air-vessel, *i*, to give it buoyancy. This float-like device, it will be seen, forms a trap to the open upper end of pipe *f*, since no gases which might ascend into said pipe could escape therefrom without first descending within the thimble-like portion of float *l*, and through the body of water resting inside of said thimble, and then ascending through the mass of water surrounding the portion *i* of said float-like device.

The under surface of the top of the thimble-like portion of float *l* is provided, by preference, with a packing or seat washer at *j*, for purposes to be presently explained, and to the top of said float *l* is connected one end of a bent rod or arm, *K*, the other end of which is coupled or connected to the outer end of the lever *l* of the water-supply-valve mechanism. This mechanism is, by preference, made as shown; and it consists, when so made, of a valve-chamber, M, having suitable branch pipes N and O for the ingress and egress, respectively, of the water-supply, and provided with a valve of peculiar construction, arranged within said chamber M, and operated from without the chamber through the medium of a stem, *m*, and

by the lever *l*, before mentioned. This valve is duplex, being composed of a main portion, *o*, and an auxiliary part, *p*, arranged and operating as will be presently explained.

P is the eduction pipe or tube leading from branch O of the valve-chamber M to the bowl A, and through which the proper amount of water is supplied, in the most approved manner, to the bowl A, to flush it and give the requisite supply of water and after-wash; and Q is a spray-pipe, arranged as shown, and communicating with the eduction-pipe P, or, if desired, with the egress branch pipe O of the valve-chamber M. This spray-pipe Q has its ring-like portion perforated, so as to effect the ejection of numerous jets of water about radially against the interior of the walls of the chamber or receptacle C, as illustrated in the drawings.

The bowl A is of such form at its lowermost part and about its throat, as clearly seen at Fig. 5, and the casting with which it is combined and by which it is supported is so made, as shown, that not only does the throat B of the bowl A set into the side socket or opening of the casting of chamber C, as usual, but these united parts have tapering shoulders, opposing each other, and between which is an interposed rubber or other packing-ring, *r*, which perfects a tight joint between the parts when they shall be forced and held toward each other.

To effect the enforcement and retention of the bowl and socket together properly, I have the horizontal seat portion T formed with a vertical flange at *t*, through which pass several set-screws, *v*, the ends of which bear against a shoe-piece or metal plate set flush against the shoulder *u* of the bowl, and by the use of these set-screws the throat of the bowl may be forced into the socket or branch pipe of C to any desirable extent to make and maintain a perfectly watertight joint between the parts.

As will be best seen by reference to Figs. 2 and 3, the discharge-valve H is made or cast, of metal or other suitable material, in about the form shown, with an annular groove at *w*, into which is snugly fitted the upper circular edge of a nearly or quite (hollow) hemispherical rubber packing device, U, which is held securely to the casting H (and in its seat at *w*) preferably by a central screw, *x*<sup>2</sup>; and it will be observed that the degree of convexity of the bottom of the casting or body of valve H so varies from that of the concavity of the upper surface of the rubber device U as to leave quite an air-space between these adjacent surfaces of these two devices.

The objects and effects of this structure are these: that not only will there be more certainty of a perfect joint between the valve and its seat under ordinary circumstances, in consequence of the greater degree of elasticity thus afforded to all parts of the seating-surface of the valve, but the valve will be perfectly seated—that is, will make a close union with the seat—even in the event of the accidental lodgment between the valve and its



seat of paper or other obstructing or interposed material, because, there being a considerable air-cushion all round back of the rubber packing device U, this device will yield at one or more points to a very considerable extent, (displacing the air behind it,) and thus render the valve capable of fitting itself over and around protruding matter resting on the valve-seat at one or more points.

The valve mechanism through which water is supplied to the closet is composed, as shown, of the chamber and duplex valve before alluded to, and has its valve opened and closed by the float I and its connecting arm or lever.

The hole or communication at E between the receptacles C and D is made for the free passage and movement of the arm K, and is so located, as will be seen, above the contemplated level of the water in the bowl and other receptacles that no floating matter or objects can pass on the surface of the water from C into D and render liable any clogging of the float device by such floating matter. The other opening, F, between C and D is located, as seen, just over the floor G, and so as to permit a perfectly free discharge of the water in D simultaneously with the emptying of receptacle C and bowl A every time the discharge-valve H is lifted up.

A few words will suffice, after the foregoing specifications of construction and parts, to make clear the general operation of the apparatus.

After use of the closet the pull-up handle is raised, as usual, which effects the lifting of the valve H clear up off its seat, and permits a sudden discharge or emptying of the mass of water contained in the bowl A and receptacles C and D, together with all excrementitious matter deposited in the bowl. At the same time the float-like device I drops until it rests on the top end of overflow-pipe *f*, which is thus closed by the packed surface or seat for said pipe end, formed at *j*, to insure the prevention of the passage upward through said pipe *f* of any sewer-gas; but the descent of the float I, through the medium of its arm K, connected to lever *l* of the water-supply mechanism, causes said lever *l* to first slightly lift the stem *n* of the auxiliary valve *p*, and then, through the intervention of said auxiliary valve, to lift the main valve *o*, opening it and permitting a full inflow of water to the branch O, and thence, through tube P, to the bowl A of the closet.

The valve H, which is supposed to be allowed to descend immediately or soon after having been lifted, is reseated while the fresh supply of water is rushing into the bowl; and this supply of water continues until a quantity shall have entered into the bowl A and communicating receptacles C and D sufficient to fill all these parts up to the former and desired level of water, when, by the floating upward to its original (and normal) position of the float I, the water-supply will be cut off by the closing of the valves *o* and *p* thus effected.

Any superfluity of water in the closet, either from leakage of the supply-valve or from the depositing of liquid or other matter into the bowl, will overflow through the pipe *f*, though no floating matter deposited in the bowl can well get into this pipe, or even into the receptacle D, since the only communication between the latter and chamber C below the water-level is down at the point F.

Every time any overflow occurs the trap at the bottom of pipe *f* is replenished, of course, with water, and so long as a sufficiency of water remains in this trap the said pipe *f* is double-trapped.

Of course, while the closet is supplied with water, as designed, any escape of gases from the sewer is nearly or quite impossible, since, besides the usual trap where the closet-pipe connects with soil-pipe, the overflow-pipe is double-trapped, the bowl is trapped by its contents, and the discharge-valve H, by reason of its novel structure, is more than usually capable of being closely seated, to prevent escape downward of the water or passage upward of gases.

Should the closet from any cause be left without any water in any part of it the passage up through it of any gas will be impossible, because the main communication between the closet and soil-pipe will be effectually sealed by the valve H, while at the same time the overflow will be sealed up by the descent (by gravity) of the valve-like float device I down onto the top end of the pipe *f*, in the manner already explained.

It will be understood from the foregoing explanations, taken together with the drawings, that in my improved water-closet are overcome, partially or wholly, serious defects hitherto found to exist, in practical use, in side-discharge closets as heretofore made, and in practicing my invention the judgment of the manufacturer is, of course, to be exercised in the selection of materials and proportioning of the parts to gain the greatest degree of perfection in the article to be made.

The forms of parts and many of the details of structure in the closet shown may, of course, be changed more or less without departing from the gist of my invention, and some one or more of the described features of improvement may be, with more or less advantages, used separately from the others in water-closet apparatus.

I therefore wish to be understood as desiring to secure by Letters Patent each and every one of the several separable features of invention under any desirable mode of carrying out my invention in the various forms in which it may be practiced.

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

1. In combination with the usual stationary overflow-pipe *f* of a water-closet, and the chambers C and D, communicating as described, and provided with the floor G, the valvular sealing device I, adapted to be seated



at such time as there shall be an absence of water in the chamber D, and allowing any extra supply of water to immediately overflow to keep the seal at the lower extremity of pipe *f* supplied, while any excess is discharged at *g*, as described.

2. The combination, with the water-supply mechanism and the float-like device I, of the overflow-pipe, so that the one float in the combination both operates the supply-valve and acts in conjunction with the overflow, as set forth.

3. In combination with the chambers C and D, communicating as described, and provided with a floor, G, the overflow-pipe *f*, extending above and below said floor and trapped at both of its ends, as and for the purposes specified.

4. Means, substantially such as shown and described, for effecting and maintaining a water-tight union between the throat of the bowl and the cast-metal portions of the closet, with which the bowl is combined, consisting, essentially, of a tapering shoulder on each part, with an interposed elastic packing, and means for forcing and holding these parts in position, as described.

In testimony whereof I have hereunto placed my hand and seal this 18th day of October, 1878.

M. F. GALE. [L. S.]

In presence of—

JACOB FELBEL,  
J. N. MCINTIRE.