

No. 610,683.

Patented Sept. 13, 1898.

P. LIEBIG.
FLUSHING APPARATUS.

(Application filed Jan. 8, 1897.)

(No Model.)

Fig. 2.

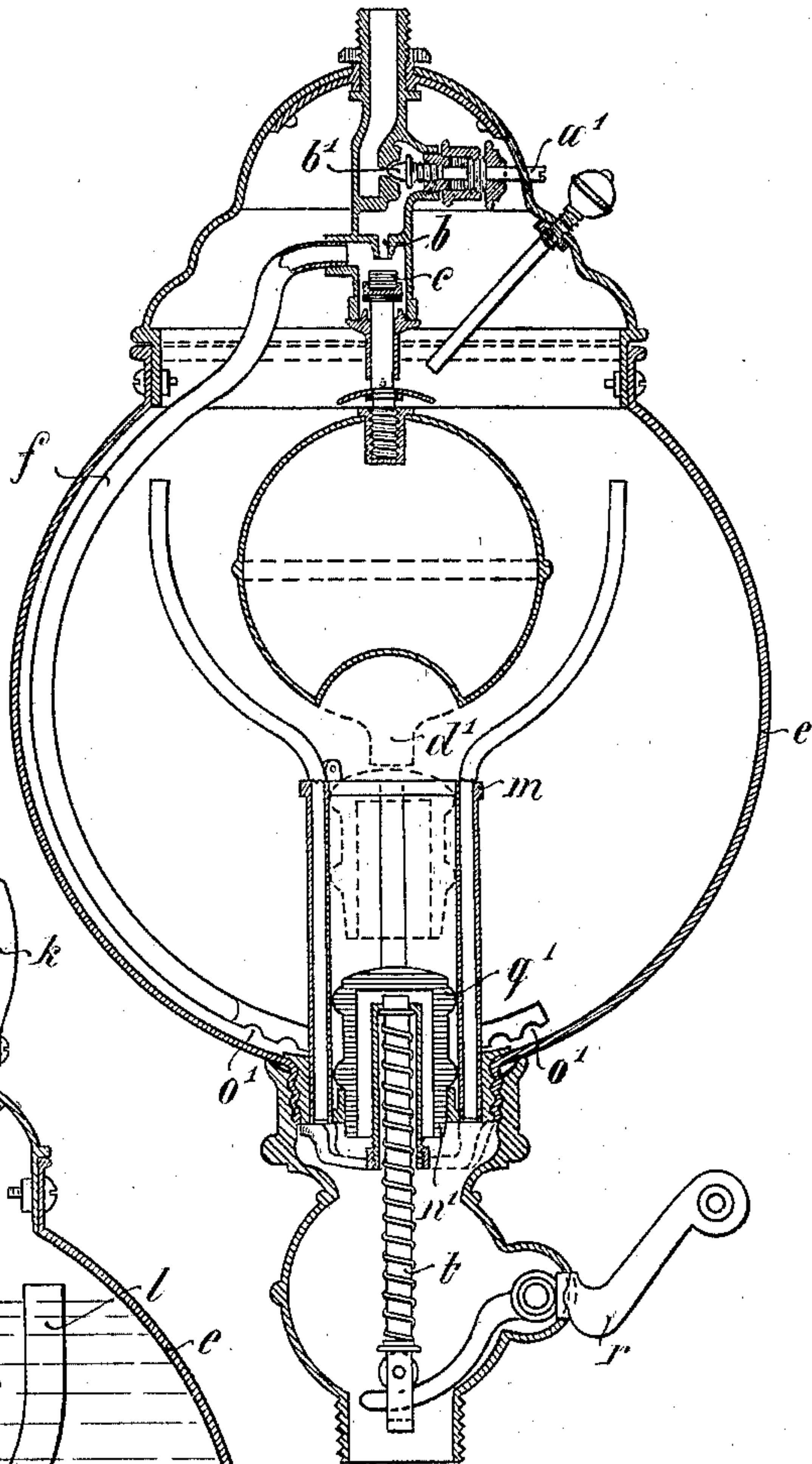


Fig. 1.

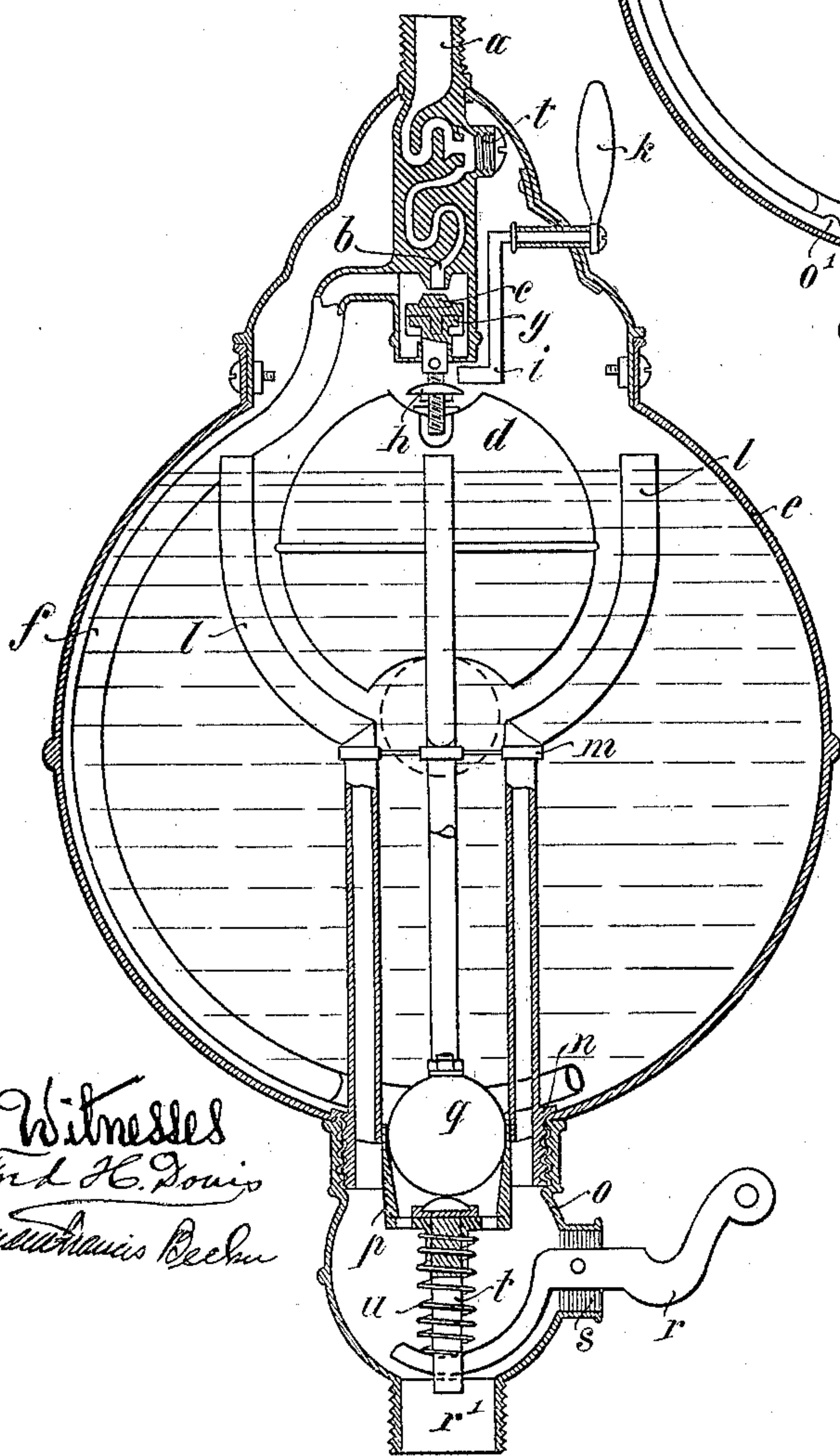
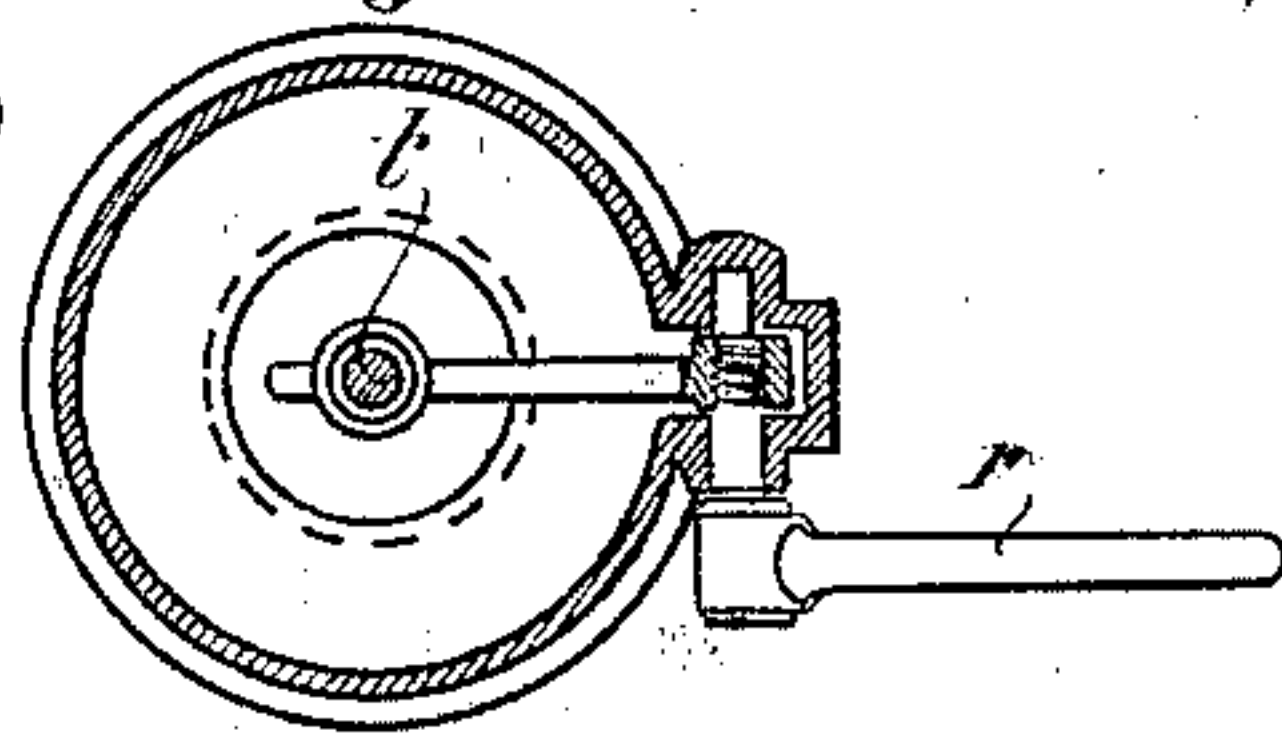


Fig. 3.



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UNITED STATES PATENT OFFICE.

PETER LIEBIG, OF FRANKFORT-ON-THE-MAIN, GERMANY, ASSIGNOR TO
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FLUSHING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 610,683, dated September 13, 1898.

Application filed January 6, 1897. Serial No. 618,169. (No model.) Patented in Germany August 21, 1895, No. 88,902; in France May 5, 1896, No. 256,094, and in Switzerland May 21, 1897, No. 14,586.

To all whom it may concern:

Be it known that I, PETER LIEBIG, of Frankfort-on-the-Main, in the German Empire, have invented a new and useful Flushing Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention forms the subject-matter of German Patent No. 88,902, dated August 21, 1895; French Patent No. 256,094, dated May 5, 1896, and Swiss Patent No. 14,586, dated May 21, 1897.

The object of the present invention is a flushing apparatus wherein a quiet inflow of the water into the vessel in question and a quick and powerful outflow of the flushing-water is produced. Further arrangements are made to obtain an absolutely secure working of this apparatus.

In the annexed drawings, Figure 1 shows one and Fig. 2 another form of this apparatus, both figures being in section. Fig. 3 is a section of Fig. 2.

The arrangement of the construction shown in Fig. 1 is as follows: The upper part *a* may be connected to any existing water-main. The water is led through a winding passage to the opening *b*, which may be closed by a valve *c*. In consequence of the said winding passage a great part of the power contained in the water is absorbed. The valve *c* carries a float *d*, whereby the opening *b* is closed automatically when the water in the reservoir has risen sufficiently to lift the float *d*. A special characteristic feature of this new flushing apparatus is that the reservoir has a spherical form. From the opening *b* the water passes through the tube *f* to the bottom of the reservoir, where it is brought into a whirling motion. By this means all noise in the inflow of the water, as experience has proved, is avoided.

In winter it is necessary for the purpose of avoiding the freezing up of the flushing apparatus to keep the valve-cone always open to a greater or less degree. For this purpose the valve-spindle *g* is provided with a nut *h*, over which a stop *i* may be placed by turning the lever *k*. The float *d* may be raised more

or less by screwing the nut *h* in one direction 50 or the other. In the middle of the reservoir overflow-tubes *l* are arranged diametrically opposite to one another, whose upper ends are held by a piece *m*, the lower ends having end pieces *n* fastened to reservoir *e*. At 55 *n* the valve *o* is arranged, which, like the reservoir, is spherical in form. A conical box *p* is here arranged as a valve-seat, and a ball *q*, whose specific gravity is less than that of the water, forms the valve. This ball is made of 60 cork or similar material and provided with a rubber covering. The lever *r* is arranged for opening the valve, which for the purpose of insuring a quiet working works in a rubber bed *s* and is normally pressed down by 65 a spring *u*. At the end of the lever *r* is a small rod *t*, by which the ball *q* can be pressed upward. At the bottom of the valve-body *o* the outflow-opening *r'* is arranged, provided with a screw-thread or with flanges for the purpose of permitting the fixing of a tube thereto. 70

The working of this new flushing apparatus is as follows: In case the reservoir *e* is perfectly emptied the float *d* will sink and the ball *q* will reach its lowest position. In this 75 position of the float fresh water enters the reservoir and the ball *q* will be pressed tighter upon its seat; but when the water has risen to a certain height the float *d* rises and the opening *b* is closed. If now the lever *r* is lowered, the bolt *t* will lift the ball *q*, so that water may pass underneath the same, whereby ball *q* will rise to the position shown in dotted lines, Fig. 1. Now the water with a powerful whirling motion rushes out of the reservoir *e*, whereby a good flushing is effected. 85 When the reservoir is emptied sufficiently to allow the float *d* to sink, the level of the water will still quickly fall, because the water enters much slower, in consequence of the winding nature of the entrance-tube and the proportionally small opening *b*, than it flows out at *p*. Finally when the reservoir *e* is perfectly emptied the ball *q* will again rest upon its seat and the water in the reservoir *e* will 95 again rise till the latter is filled and the opening *b* is shut.

Beneath the inlet *a* a throttle-valve may be

arranged to adjust the apparatus according to the water-pressure in the feeding-pipes.

In Fig. 2 another form of execution of this apparatus is represented, wherein the following alterations or additions are made: The entrance, which previously consisted of a winding passage, is much simpler in this form of construction, besides which there is an arrangement of a stuffing-box with adjusting-screw a' , as shown in the drawings. This screw a' has a cone b at one end to stop the outflow. The power of the entering water is diminished by this cone, and the water therefore enters quietly. The principal object of this arrangement is to regulate the inflowing water independently of the water-pressure in the feeding-tubes. By the adjustment of this screw a' , which is of easy access, a regular filling of the reservoir is effected. The water passes from the opening b through tube f , which has its outlet in the under part of the spherical reservoir. The end of the tube is closed, but its sides perforated with a number of holes o' in such a way that the water issues spray-like and quietly into the reservoir e . The valve, instead of having a spherical form, is in this case a hollow rubber body q' . It has a conical end piece n' , provided with two guiding projections for the purpose of reducing the friction to a minimum without impairing the guiding. This rubber body is made of molded Para rubber and is therefore extremely light. As soon as the lever r is lifted the rubber body q' rises, and because filled with air the water cannot enter, as in diving-bells. It therefore remains in its raised position till the reservoir is quite empty. The mode of actuating this modification is the same as described above.

To the ring m an eye is fastened at both

sides, so that in rising the body is prevented by means of pins from getting out of position.

For the purpose of preventing the inflow of more water than is necessary should the chain be pulled too long the float can be formed as shown in dotted lines at d' . When the lever r is actuated, the rod t , with the rubber body q' , is raised. The float shuts up the opening b by means of the valve c , and therefore no more water is able to enter into the reservoir, no matter how long the chain be pulled. With this modified form of float the piece m and the guiding-pin are not required, because the rubber body is held in position by the float. The lever r in this construction is not provided with a rubber bed to work in, as in the first form of construction, but a bolt is used which is made to fit its bearing accurately.

The apparatus is fastened in the simplest manner by means of a double-angled piece attached to the reservoir e , connected in any suitable way to a wall.

What I claim, and desire to secure by Letters Patent of the United States, is—

In combination in a flushing-tank, a discharge-passage leading therefrom, a buoyant body closing the said discharge-opening, and normally held therein by the superposed water, mechanical means for displacing the said body at will, to cause flushing, and a plurality of overflow-pipes l , forming guides for the rise and fall of the said buoyant body, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

PETER LIEBIG.

Witnesses:

DEAN B. MASON,
FRANK H. MASON.