

(No Model.)

R. MURPHY & C. W. ATKINSON.
FLUSHING DEVICE FOR URINALS.

No. 401,575.

Patented Apr. 16, 1889.

FIG. I.

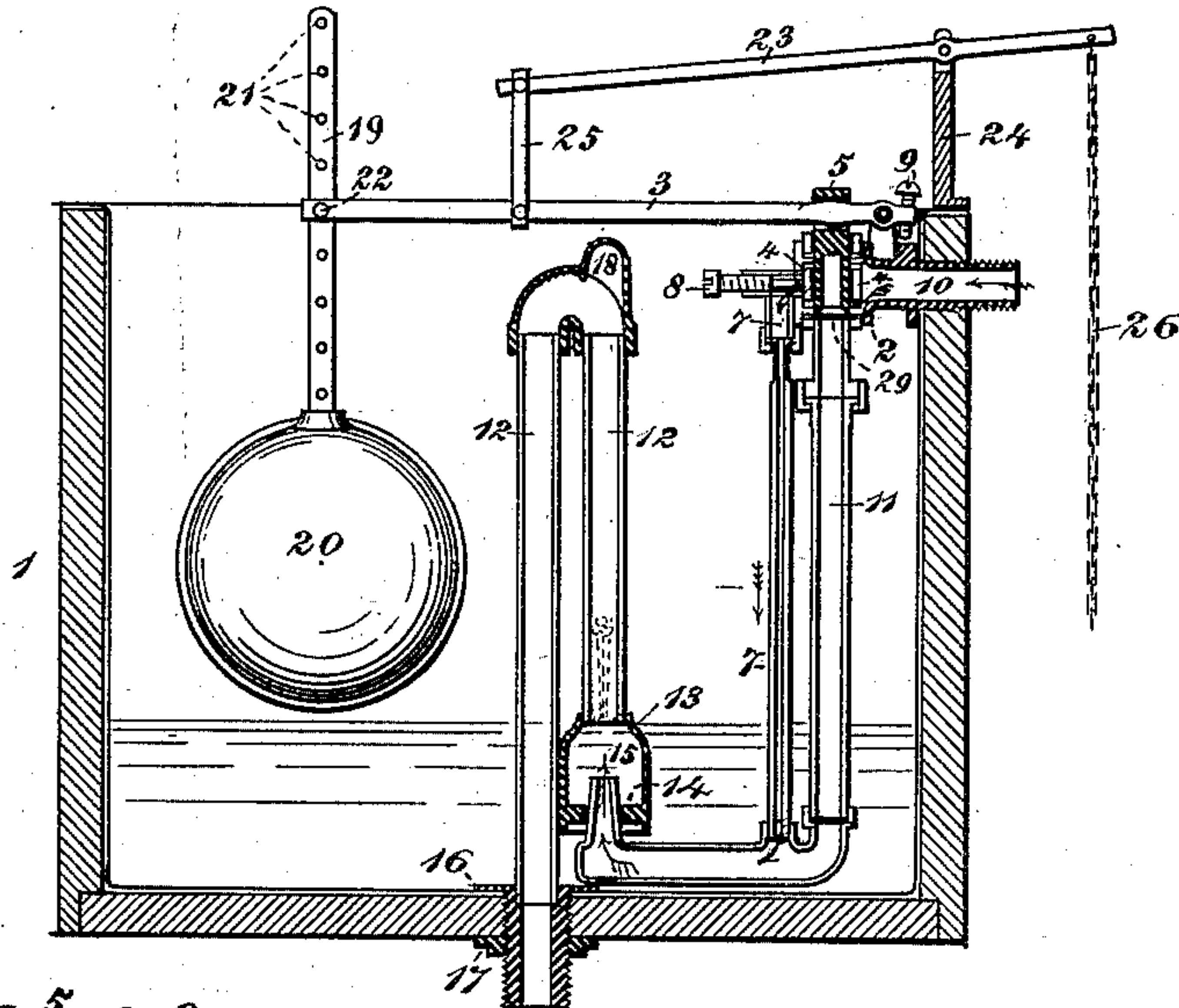


FIG. III.

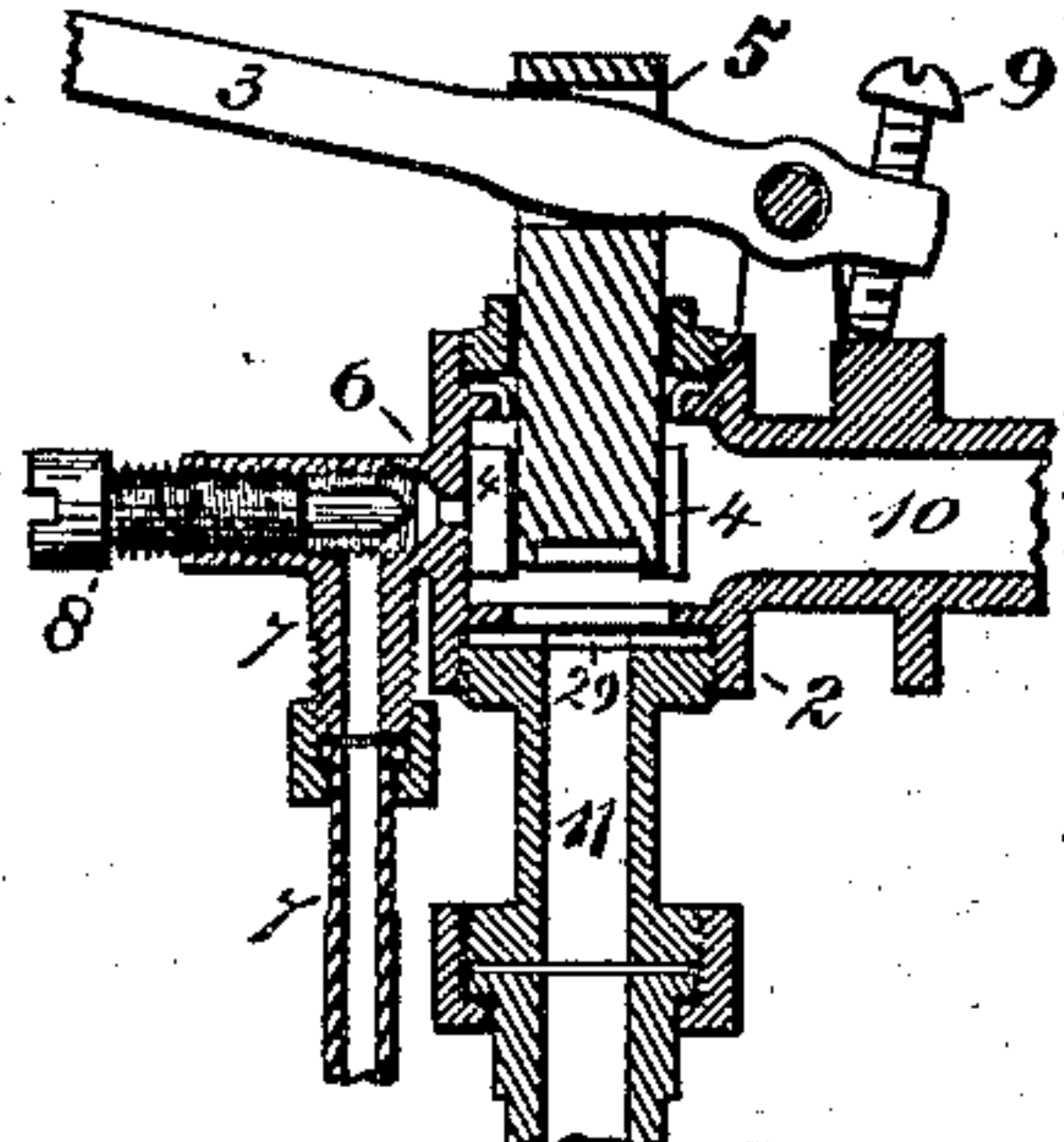


FIG. IV.

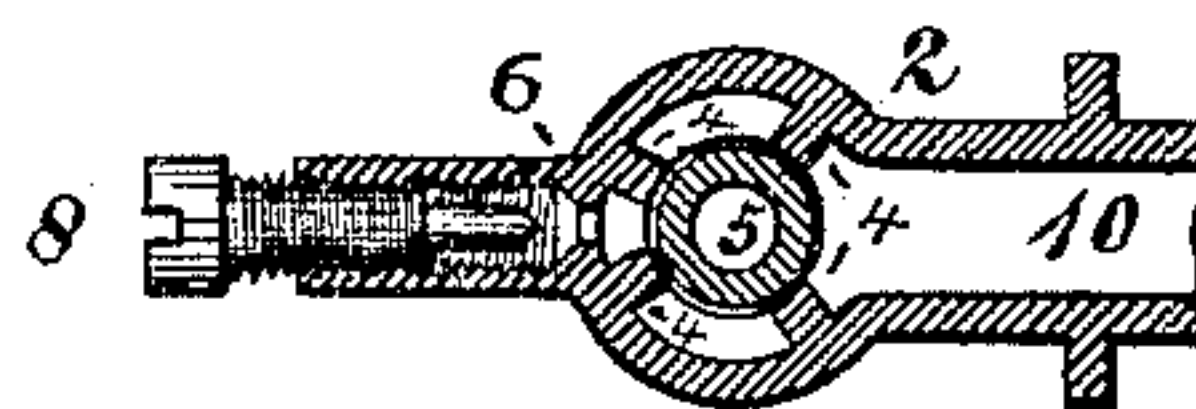


FIG. II.

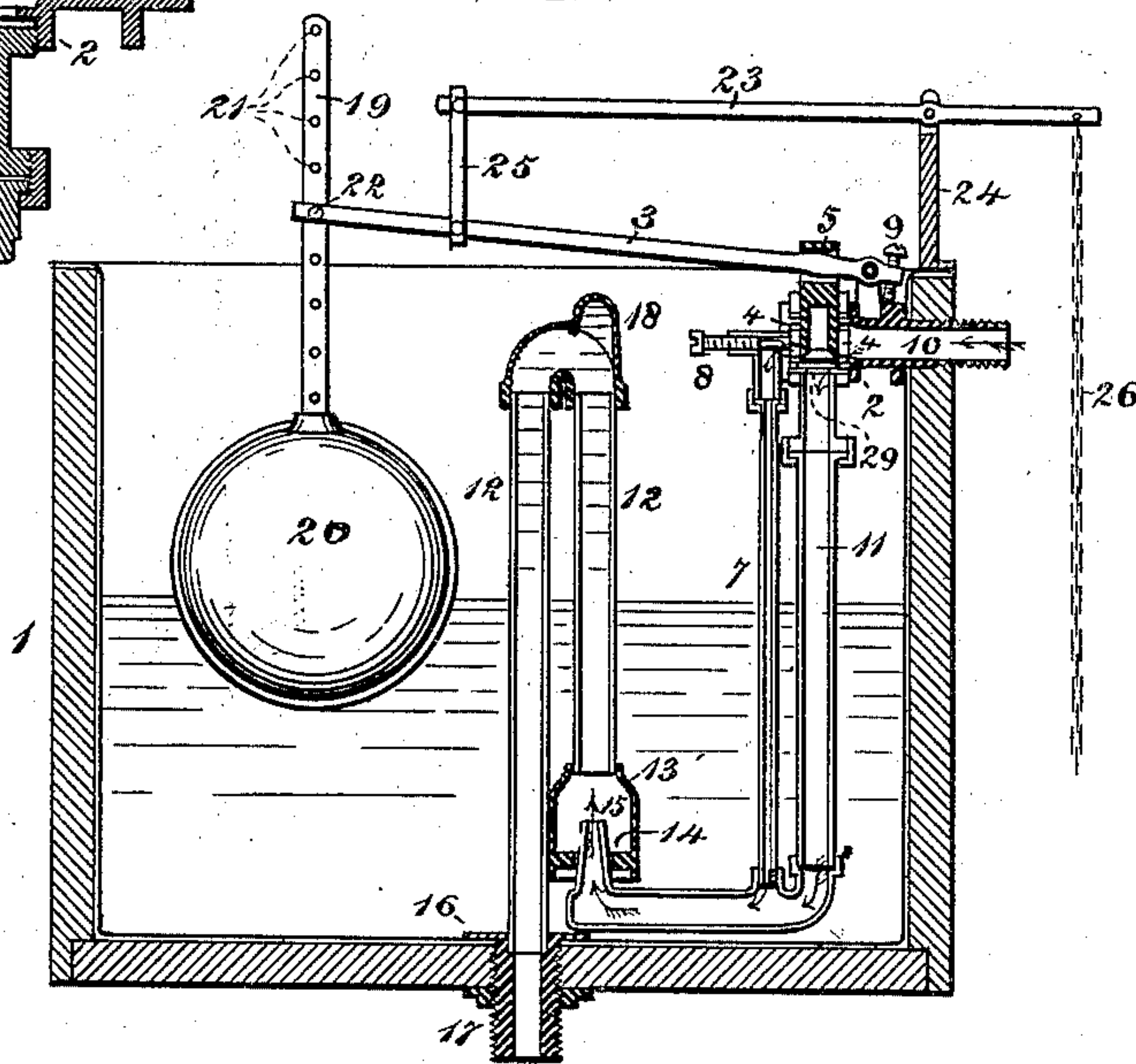
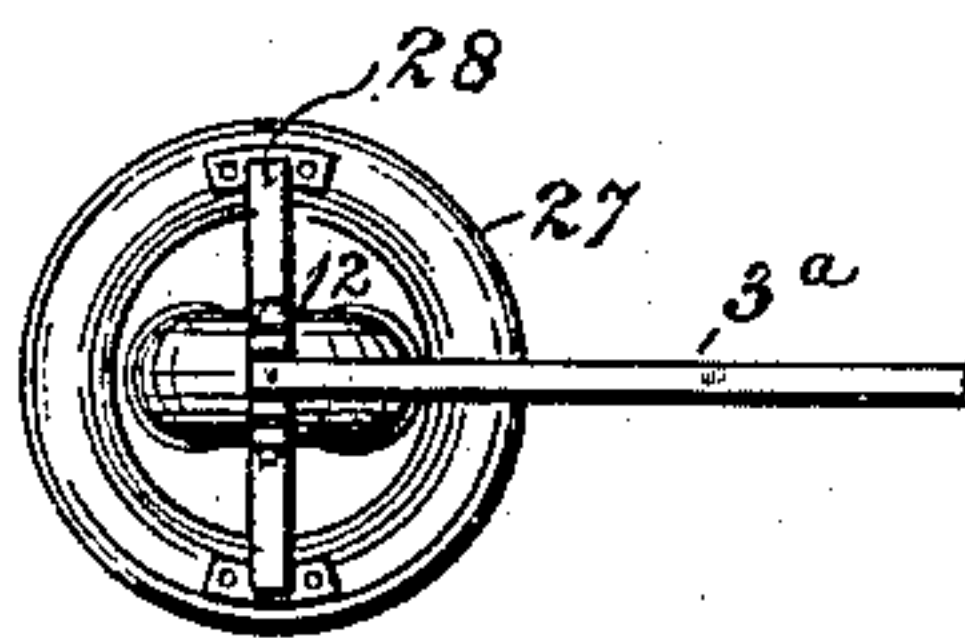


FIG. V.



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UNITED STATES PATENT OFFICE.

RICHARD MURPHY AND CHARLES W. ATKINSON, OF CINCINNATI, OHIO.

FLUSHING DEVICE FOR URINALS.

SPECIFICATION forming part of Letters Patent No. 401,575, dated April 16, 1889.

Application filed October 4, 1888. Serial No. 287,138. (No model.)

To all whom it may concern:

Be it known that we, RICHARD MURPHY and CHARLES W. ATKINSON, both of Cincinnati, Hamilton county, Ohio, have jointly invented a new and useful Improvement in Flushing Devices for Urinals, of which the following is a specification.

Our invention, although specially designed for urinals, is also applicable to water-closets, and is capable of being operated either automatically or manually.

Our improvements have for their objects, first, to lessen the gurgling noise which occurs ordinarily when the flushing-tank is being emptied; second, to provide means whereby flushing can be accomplished either automatically or at the discretion of the operator; third, provisions which secure various automatic flushing at various intervals.

In order to accomplish the above-stated results, our device is so constructed that the raising of the ball or float by the water will, instead of operating to cut off the water-supply, operate momentarily to admit a larger supply of water, thereby (by means hereinafter described) "siphoning out" the water in bulk, instead of depending on the ordinary overflow, which allows a small portion only of the water to escape.

In the accompanying drawings, Figure I is a longitudinal vertical section showing the normal or inactive condition of our flushing device. Fig. II represents the same in operation. Fig. III is an enlarged section of the ball-cock. Fig. IV is a central horizontal section of the ball-cock. Fig. V shows the method of application of an ordinary ring-float to our device.

1 may represent a suitable elevated reservoir or tank, into one side of which is screwed a ball-cock, 2.

3 represents a lever of the second class. The ball-cock is provided with lugs 4, which serve to guide the plunger 5, and yet are not so long as to prevent the water from flowing both above and beneath them to the port or opening 6, through which the water escapes to the by-pass 7. A set-screw, 8, is capable of being screwed toward or away from the said port 6 to enable discretionary regulation of water-supply to the said by-pass. The lever 3 has upon

one end a set-screw, 9, for any desired discretionary limitation of the sweep of said lever. This provision is, further, for preventing the lever from getting so high as to bind when the water enters from the service-pipe with unusually great force.

The main supply-pipe 11 and the by-pass 7 join near the bottom of the tank. A siphon, 12, has upon one end an enlarged mouth-piece, 13, whose perforated cross-bar 14 receives and holds the siphon-jet 15 of the main supply-pipe. The object of this enlarged mouth-piece is to compensate for the space taken up by the said siphon-jet. The other end of the siphon passes through the tank-floor, to which it is rigidly secured by plate 16 and washer 17. This end projects slightly beyond the tank-bottom, in order that a flushing-pipe may be connected thereto.

The siphon may be surmounted by a chamber or chambered extension, 18, for purposes hereinafter set forth.

The stem 19 of the ball or float 20 is provided with perforations 21. A screw, 22, by engaging in the lever and the said stem-perforations, is capable of holding the float to any desired adjustment. A lever, 23, which fulcrums at 24, is so connected with the lever 3 by means of the rod 25 that any one may by pulling upon the chain 26 open the ball-cock, and thus give a force-wash.

In the modification shown in Fig. V, 27 represents a "ring-float," which surrounds the siphon, and is controlled by the lever 3 and the arm 28, which projects sufficiently far above the top of the siphon to prevent it (at the float's lowest position) from colliding with said siphon.

Our above-described flushing device operates as follows: The water entering by the service-pipe passes, as aforesaid, over the lugs or projections 4 (the plunger 5 being caused to press firmly against its seat 29 by the gravitation of the float 20) and through the port or opening 6 into the by-pass 7, down which it flows into the main supply-pipe 11, whence it escapes through the siphon-jet 15. The lower portion of the main supply-pipe is continually "trapped" or filled with water, so that water entering same from by-pass is thereby prevented from making any noise.

Now the ball 20 will, of course, not float until there is a sufficient amount of water in the tank to buoy up the ball and overcome its weight and that of its attachments and the
 5 adhesion of the plunger to its seat. When the water has reached this point, it will force the ball (and consequently the plunger) suddenly upward, which will turn on full pressure from the service-pipe into the main supply-pipe 11. The water thus violently ejected
 10 from the supply-jet 15 will partially impinge against the crown of the chambered extension 18, and thence will fall back and pass to the siphon-jet 15 of the siphon, and thus rapidly
 15 fill the same, while the remaining water will be deflected by the arched crown of the U-coupling into the other limb of the siphon, from which it will expel the air and will consequently cause immediate siphoning of
 20 water out of the tank until the siphon begins to "draw air" from the water sinking below the level at which it buoys the float, which latter has, of course, in the meantime descended, thereby reseating the plunger in
 25 readiness for a repetition of the above-described movements.

The represented enlarging of the mouth-piece not only serves to hold and to guide the siphon-jet, as aforementioned, but also (by its
 30 construction) causes the siphoning to cease a little before the surface of the water has sunk to the plane of the entrance of the mouth-piece. This partial stoppage of siphoning is assisted by the orifice 13, which allows a pre-
 35 mature admission of a small amount of air into the siphon.

By adjusting the float upon its lever and the set-screw 8 to or from the port 6 no less than four different kinds of washes or flushes
 40 may be obtained. Thus, first, by nearly closing the port with the set-screw and by setting the float at a point within near proximity to the tank-floor slight washes at long intervals (of an hour or more) may be obtained; second,
 45 or, by keeping the float at the same adjustment and such adjustment of the set-screw as to allow more water to enter the by-pass small washes at short intervals (at any periods less than an hour) may be obtained;
 50 third, by nearly closing the port and setting the float at a lower perforation in the stem larger washes may be obtained at longer intervals; fourth, lastly, by opening the port and setting the float to a considerable elevation in the tank very copious washes at short
 55 intervals may be obtained.

By completely closing the port with the set-screw the flushing mechanism can be for the time being rendered inoperative.

The chambered extension 18 operates to receive the "spurt" from the siphon-jet when there is a very copious flow through the port, and in this way prevents water from being deflected around the curved wall of the U-shaped coupling into the long leg of the siphon.
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A great practical advantage of the above-described arrangement, especially with turbid or muddy water, is that the port or opening 6 and the by-pass 7 are frequently scoured or
 70 cleaned by the sudden rush of water through them consequent on the sudden closure of the ball-cock.

We claim as new and of our invention—

1. In a flushing device for urinals, the combination of the automatic and the manual means for discharging water from the tank, consisting substantially of the following elements, to wit: a ball-cock, 2, having a plunger, 5, which is guided by lugs 4, and port 6, which
 75 operates at regulatable intervals of time to admit for a short space of time a spurt of water through main supply-pipe 11 into the siphon 12, for the purpose specified, a lever, 23, for manual operations of said ball-cock, a
 80 siphon, 12, the siphon-jet 15, a by-pass, 7, through which passes the normal supply, and a set-screw, 8, for controlling the flow into said by-pass, and a stem, 19, provided with perforations 21, as and for the purposes set forth.
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2. In a flushing device for urinals, water-closets, &c., a siphon having its longer arm passing through and secured to the tank-floor and having upon the shorter arm an enlarged
 95 mouth-piece which is provided at its upper end with a small orifice for the purposes set forth, said enlarged mouth-piece also carrying a perforated cross-bar which receives the siphon-jet of the main supply-pipe, and a chambered
 100 projection in the U-shaped coupling for receiving jets of water from the siphon-jet, as and for the purpose set forth.

In testimony of which invention we hereunto set our hands.

RICHARD MURPHY.
 CHARLES W. ATKINSON.

Attest:

N. ROCKHOLD,
 G. H. KNIGHT.