

W. J. FROST.

BALL COCK.

APPLICATION FILED MAY 2, 1908.

938,470.

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Fig. 1.

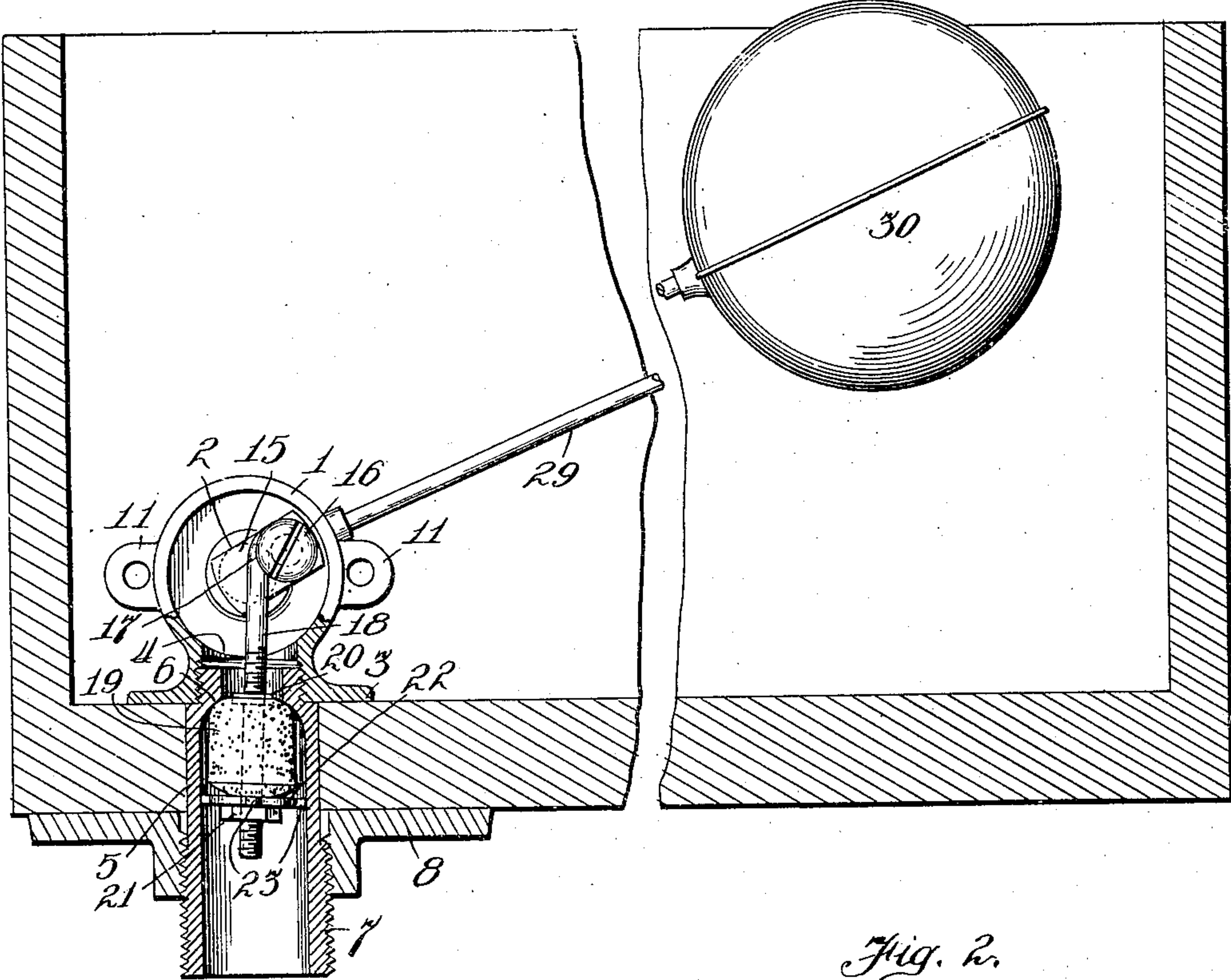


Fig. 2.

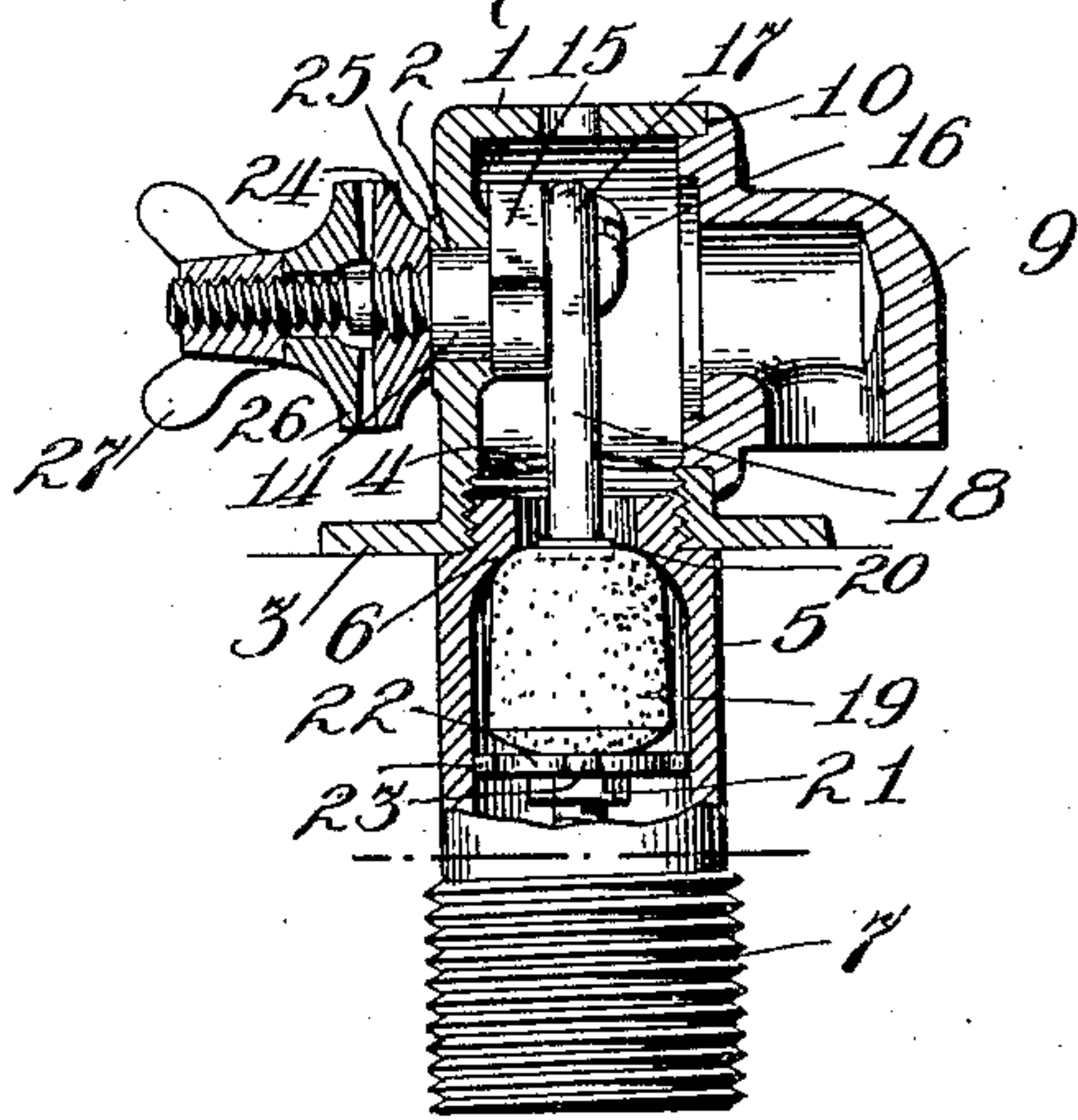


Fig. 3.

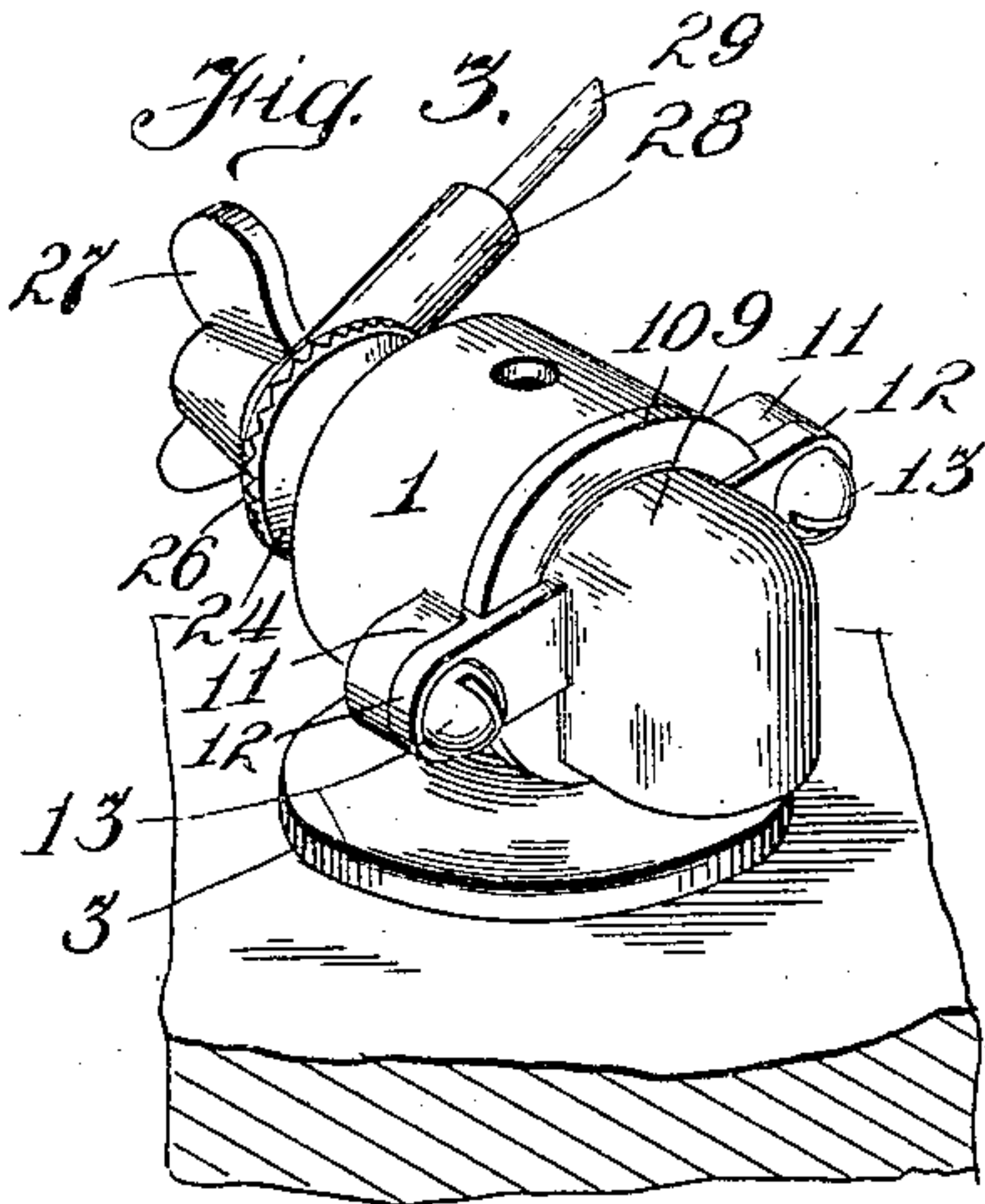
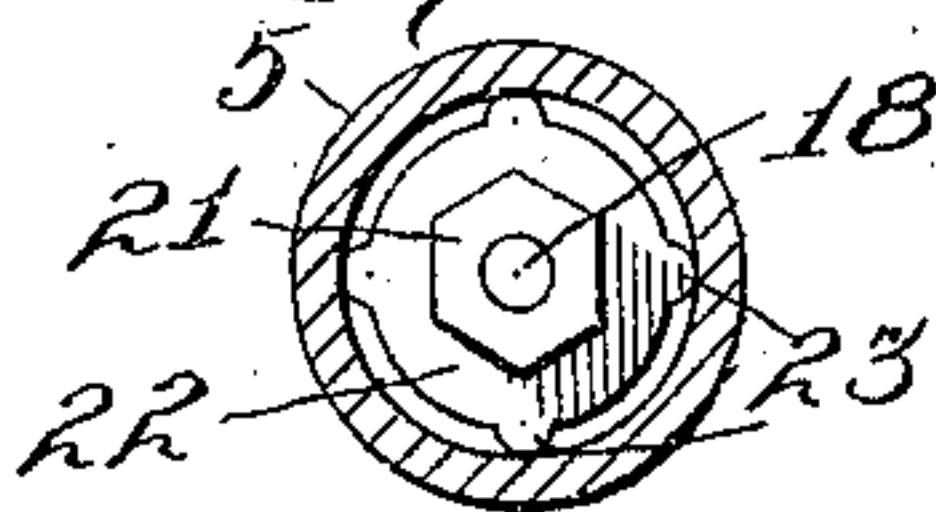


Fig. 4.



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# UNITED STATES PATENT OFFICE.

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BALL-COCK.

938,470.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, WALTER J. FROST, a citizen of the United States, residing at Kenosha, in the county of Kenosha and State of Wisconsin, have invented certain new and useful Improvements in Ball-Cocks, of which the following is a specification.

This invention relates to improvements in ball cocks, and it has among its salient objects to provide a construction in which the parts are so organized that the valve member closes against its seat in the same direction in which the pressure of the incoming water is exerted; to provide a construction in which the valve mechanism proper is of what is known as the Fuller type, *i. e.* so organized that the valve plug is mounted on one end of a stem, the other end of which is directly connected with a pitman wrist or other eccentrically located wrist, which in oscillating carries the valve to and from its seat positively; to provide in a mechanism of the character last above mentioned such a construction and arrangement that the operative mechanism is housed in an extremely simple and comparatively small casing, so disposed with reference to the valve seat that a direct connection is provided between the moving and moved members; to provide a construction which is extremely compact and so organized that it can be conveniently used either as a bottom inlet, as a side inlet or as an elevated standing-free inlet; to provide a construction in which by reason of the fact that the pressure of the incoming water aids in closing the valve, a small float but slightly lighter than the water may be used; to provide a construction which affords most convenient and reliable means for adjusting the several parts for different conditions; to provide a construction so organized as to be comparatively noiseless, and in general to provide a simple and improved device of the character referred to.

To the above ends the invention consists in the matters hereinafter described, and more particularly pointed out in the appended claims.

The invention will be readily understood from the following description, reference being had to the accompanying drawing, in which—

Figure 1 is a sectional view taken vertically and axially through the main body of

the valve construction and through the tank in which the latter is located, parts of the tank and stem of the float being broken out to reduce the size of the figure; Fig. 2 is a vertical sectional view of the valve or ball cock mechanism taken at right angles to that shown in Fig. 1; Fig. 3 is a perspective view of the device detached and looking at the discharge side of the same. Fig. 4 is a horizontal sectional detail taken through the lower part of the tubular extension shown in Fig. 2 and looking upwardly.

In said drawing 1 designates a casing, which is interiorly cylindric, open at one end, closed at the other except for a central journal aperture 2, and provided at its lower side with a base flange 3 adapted to rest against the bottom or side wall of the tank, depending upon in which position the valve is placed. Through the lower side of the cylindric casing is formed an inlet aperture 4, interiorly threaded and receiving the correspondingly threaded upper end of a tubular extension 5. The interior of the tubular extension 5 is contracted near its upper end to provide an annular valve seat 6, and the lower end portion is threaded, as indicated at 7, to receive a clamping washer 8 threaded thereupon and cooperating with the flange 3 to hold the device in position. One end of the cylindric casing 1 is closed by a detachable spout member 9, which is preferably rabbeted, as indicated at 10, to fit partly within and partly against the end wall of the casing, and in itself so formed internally as to constitute a downwardly opening discharge spout. At each side the casing 1 is provided with outstanding ears, as 11, and similarly the spout member is provided with outstanding ears 12 which register with the ears 11; clamping screws 13 being inserted loosely through the ears 12 and threaded into the ears 11.

Journalled to extend through the back or closed end wall of the main casing is a crank shaft 14, which accurately fits the journal aperture 2 and is provided at its inner end with a rigid crank arm 15 (preferably formed integrally with the crank shaft) and carrying a screw-stud or wrist 16 with which is connected the eye-portion 17 of a valve stem 18. The valve stem projects downwardly into the tubular extension 5 and carries an elastic valve plug 19. The part of the stem which extends through the valve member is threaded, and nuts thread-



ed upon the same at each end of the valve body, as 20 and 21, serve to confine the valve plug in suitably adjusted position relatively to the valve seat. Between the lower nut 21 and the valve body is interposed a guide washer 22, the main body of which is of less diameter than the interior of the tubular extension and is provided with radial guide projections or star points 23 which engage the interior of the extension and keep the valve body substantially centered.

Upon the crank shaft 14 is fixed one member 24 of an adjusting ratchet; the inner face of said member being arranged to rest against a shoulder 25 formed upon the crank shaft substantially flush with the outer end face of the casing so that the washer member serves to confine the shaft against endwise movement in one direction while the crank arm itself serves to prevent movement of the shaft in the opposite direction. The member 24 is shown as threaded upon the shaft but may be fixed thereon in any other suitable manner.

26 designates a cooperating ratchet member which slips loosely upon the threaded external portion of the crank shaft; the meeting faces of the two members 24 and 26 being provided with interfitting teeth or ratchets, which, when the parts are held against each other, lock them rigidly together as regards rotative movement. Upon the end of the crank shaft is threaded a thumb-nut 27 which performs the function of so locking the ratchet members together in any desired angular relation to each other. The member 26 is provided with a socket-arm 28 extending radially therefrom, within which is fixed the stem 29 of a hollow ball or other suitable float 30.

It will be obvious that the angular position of the float stem and float relatively to the crank-arm may be adjusted at will. These parts will, of course, be so adjusted that when the water level has risen to the desired height in the tank, carrying with it the float 30, the crank-arm will assume a position which holds the valve plug closed against its seat; such position being indicated clearly in Fig. 1 of the drawing. As the water is let out of the tank for flushing purposes (the means for discharging the tank form no part of the present invention, and being not shown) the float descends, and in so doing forces downwardly the valve plug and opens the valve. Thereupon the water will flow in through the valve or ball cock, filling the interior of the chamber and discharging downwardly out through the spout member 9. The extremely small cylindric chamber which contains the operative mechanism, its location in direct alinement and immediate communication with the inlet port, and the short downturned outlet directly communicating with this compara-

tively small valve chamber insure an almost noiseless operation of the device; there being little or no opportunity for gurgling with its incidental noise.

The device embodies the desirable adjustability and positiveness of action of the Fuller type of valves, enabling the device to be adjusted to compensate for wear and deformation of the valve plug with the greatest facility, and it is to be noted that the parts are so constructed as to be capable of manufacture at an extremely low cost. That is to say, the form of construction is such that it may be readily cast or formed of drawn metal parts; the cylindric sides and circular end of the main casing are concentric with the journal aperture there-through so that these parts may be most conveniently turned or dressed off; the receiving end of the discharge spout is bored concentric with the rabbet 10 at the periphery of this member so that these parts may be conveniently machined, and the construction throughout is well designed to be manufactured at a minimum cost, and at the same time secure a most durable and effective construction.

No change whatever in the construction is necessary to adapt it for use as an inlet through the side wall of a flushing tank and where it is desired to use it as a standing-free elevated inlet, this is accomplished by simply mounting it upon the upper end of a pipe which extends through the bottom wall of the flushing tank and rises to the desired height.

I claim as my invention:

1. In a ball cock, a generally cylindrical casing open at one end and provided with an enlarged base support and having a lateral discharge outlet, a tubular inlet extension connected to said base support, a rock shaft journaled to extend through the end wall of the main casing opposite the discharge outlet, at or approximately at right angles to the longitudinal axis of said tubular extension, a crank upon said rock shaft within the casing, an annular valve seat controlling the passage through said tubular extension, a valve stem connected with the crank of the rock shaft, a valve plug upon said stem cooperating with said annular valve seat, and a stemmed float connected with the rock shaft externally of the casing and extending radially therefrom.

2. In a ball cock, a casing comprising a main chamber having a base support and a lateral discharge opening, a tubular inlet extension connected to said base support, a rock shaft journaled to extend through the opposite end wall of said casing, at or approximately at right angles to the longitudinal axis of said tubular extension, a crank upon said rock shaft within the casing, an annular valve seat controlling the



passage through said tubular extension, a valve stem connected with the crank of the rock shaft, a valve plug upon said stem co-operating with said annular valve seat, and  
5 a stemmed float operatively connected with the rock shaft externally of the casing and extending radially therefrom.

3. In a ball cock, the combination with a cylindrical casing forming a main chamber  
10 and having a lateral discharge outlet, a tubular inlet extension connected to said casing, a rock shaft journaled to extend through the opposite end wall of said casing at or approximately at right angles to the longi-  
15 tudinal axis of said tubular extension, a stemmed float operatively connected with the external end of said rock shaft, a valve stem operatively connected with the internal end of said rock shaft and extending through  
20 the valve port and tubular extension, and a valve plug carried by said stem and co-operating with said valve seat.

4. In a ball cock, a generally cylindrical casing open at one end and provided with

an enlarged base support internally screw 25 threaded, an end closure member detachably secured to the open end of said main chamber and having a lateral discharge spout, a tubular inlet extension telescoping within said base support, a rock shaft journaled to  
30 extend through the end wall of the main casing opposite the discharge spout, at or approximately at right angles to the longitudinal axis of said tubular extension, a  
35 crank upon said rock shaft within the casing, an annular valve seat controlling the passage through said tubular extension, a valve stem connected with the crank of the rock shaft, a valve plug upon said stem co-  
40 operating with said annular valve seat, and a stemmed float connected with the rock shaft externally of the casing and extending radially therefrom.

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Witnesses:

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