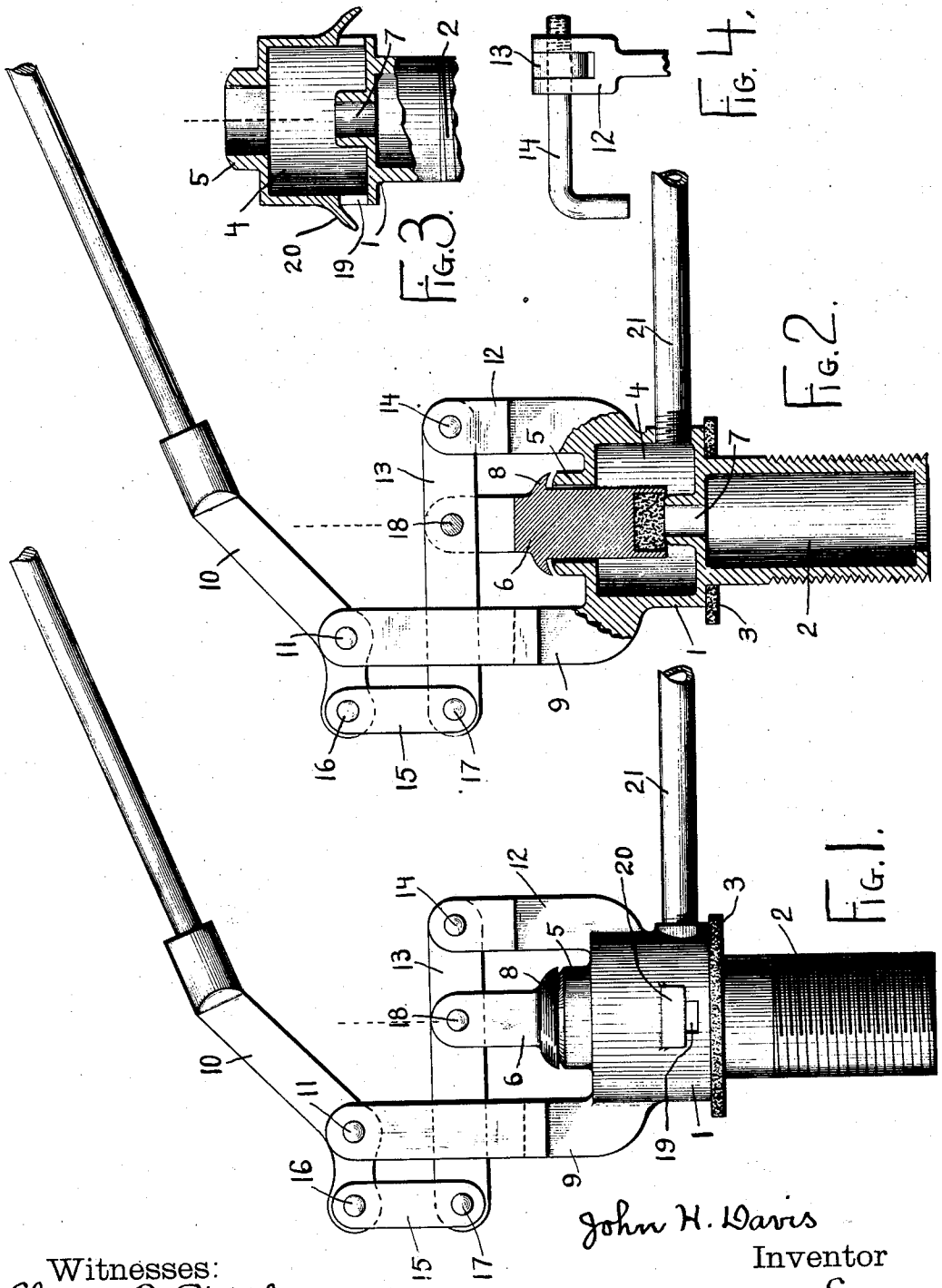
No. 874,575. PATENTED DEC. 24, 1907.

J. H. DAVIS.

BALL COCK.

APPLICATION FILED AUG. 10, 1905.



Witnesses:
Elmer R. Shipley
M. S. Belden.

John H. Davis
Inventor
by James W. See.
Attorney

UNITED STATES PATENT OFFICE.

JOHN H. DAVIS, OF HAMILTON, OHIO, ASSIGNOR TO THE SANITARY MANUFACTURING COMPANY, OF HAMILTON, OHIO.

BALL-COCK.

No. 874,575. Specification of Letters Patent. Patented Dec. 24, 1907.

Application filed August 10, 1905. Serial No. 273,509.

To all whom it may concern:

Be it known that I, JOHN H. DAVIS, a citizen of the United States, residing at Hamilton, Butler county, Ohio, (post-office address No. 229 North Ninth street, Hamilton, Ohio,) have invented certain new and useful Improvements in Ball-Cocks, of which the following is a specification.

This invention, relating to that class of float-controlled supply valves employed in connection with tanks and generally known as "ball cocks" aims to improve such cocks by better adapting them for use with water of a kind liable to clog metal valve-parts working in contact, and to secure ready removability of the working parts. The cock is of that type employing a compound lever system between the float and the valve proper.

The improvements will be readily understood from the following description taken in connection with the accompanying drawing in which:—

Figure 1 is a side elevation of my improved ball cock: Fig. 2 a vertical section of the same: Fig. 3 a vertical section through the valve chamber in a plane at right angles to the plane of the section shown in Fig. 2: and Fig. 4 a front elevation of one of the lever-joints.

In the drawing:—1, indicates the valve-body, being a casting adapted to seat upon the floor of a tank, as usual: 2, the inlet nose thereto, adapted, as usual, to go through a hole in the floor of the tank and have the supply pipe coupled to it below the tank: 3, the usual gasket to be clamped between the valve-body and the floor of the tank: 4, the valve-chamber, within the valve-body 1: 5, the roof of the valve-chamber, the same being provided with an upwardly projecting central boss having a circular aperture: 6, the valve proper, being a cylindrical plug of markedly smaller diameter than said circular aperture, through which it extends without contact and having its lower end faced with rubber or analogous material, the upper end of the valve proper being bifurcated: 7, the inlet to the valve-chamber, the same being formed by a central aperture extending through a boss extending upwardly from the floor of the valve-chamber, the annular top of this boss forming the valve-seat against which the lower end of the valve proper seats: 8, an umbrella flange surrounding the valve proper above the roof boss through which it projects, this flange coming as closely down to the top of the boss as is consistent with the proper seating of the valve in its original condition and in such condition as is liable to result from continued use: 9, a bifurcated arm projecting rigidly up from the valve-body, parallel with the axis of the valve proper, and to a point some distance above the latter: 10, the float lever, pivoted in the upper end of arm 9, the long arm of this float lever projecting over but at all times free from the valve proper, and being adapted to carry the usual float, the short arm of this float lever projecting outwardly from arm 9: 11, the pivot connecting the float lever with arm 9: 12, a bifurcated arm projecting rigidly upward from the valve body at a point diametrically opposite arm 9: 13, a secondary lever having one end pivoted to the arm 12, and an intermediate point pivoted to the bifurcated upper end of the valve proper, the longer arm of this secondary lever projecting through the bifurcation of arm 9, below the pivot 11 in the latter, and to a point outwardly beyond arm 9 so that its outer end is below the outwardly projecting short arm of the float lever: 14, the pivot connecting secondary lever 13 with arm 12: 15, a link connecting the end of the long arm of the secondary lever with the end of the short arm of the float lever and having such length that the secondary lever will be substantially horizontal when the valve is closed: 16, the pivot uniting the upper end of link 15 with the float lever: 17, the pivot uniting the lower end of the link with the secondary lever: 18, the pivot uniting the secondary lever with the valve proper: 19, outlet ports in the base of the wall of the valve-chamber: 20, deflecting shields projecting outwardly from the valve-body over these ports: and 21, a small pipe leading outwardly from the valve chamber.

In the drawing the valve is seen in closed position, in which position it is held by the action of the float through the medium of the compound leverage. The pressure is directly downward axially upon the valve proper, its body being entirely free from contact with and having considerable clearance on all sides from the wall of the aperture in the roof of the valve chamber, the secondary lever centering it and preventing its displacement. The degree of looseness where the valve

proper passes through the roof of the valve chamber should be in excess of any looseness at pivot 14, plus the versed sine of the arc through which the pivot 18 moves as the valve proper rises and falls. The result is that the valve proper when seated is held without guiding contact with the roof of the valve chamber. The clearance between valve 6 and the aperture in the top of the casing permits a flow of water from the casing at this point which is ample to carry away sediment which tends to deposit and would otherwise clog the valve and prevent its free movement. This rush of water between the valve and boss 5 occurs at every opening of the valve. Umbrella flange 8 deflects water issuing from the top of the casing downward into the tank. Valve 6 while very loose in the casing is positively guided by its pivotal connection at 18 with lever 13 and on this account and because of other features of construction the valve is noiseless in operation.

The upper end of the valve proper, when the valve is either open or closed, is supported by the secondary lever 13 bridging the space between the arms 9 and 12 and guided sidewise in the bifurcations of those arms. The valve proper is thus supported in all directions at its upper end through the medium of the secondary lever.

In Fig. 4 the form of pivot 14 is shown, the pivot being removable by being unscrewed from arm 12, the bend in the outer end of the pivot forming a convenient handle for turning it. The pivots 11 and 14 are to be of the removable type indicated in Fig. 4 and it is preferable that pivot 18 be also of this type. By removing pivots 11 and 14, all of the moving parts may be removed upwardly for inspection or repair, it not being necessary to remove the valve body from the tank.

Pipe 21, serves, in the usual manner, in connection with the reseal if the ball cock is used in connection with a closet requiring such feature. This pipe may serve in the usual way to discharge resealing water into the flush pipe while the flush valve is open.

When the valve is open and the supply water is discharging into the tank through ports 19 the low-down location of those ports insures a complete washing out of the valve chamber, thus preventing the accumulation of foreign matters at the face of the valve seat.

When the valve is open the valve plug hangs as a freely suspended structure, hanging by pivot 18. The engagement of the upper end of the plug with lever 13 is such that the upper end of the valve can shift in neither direction, being prevented from shifting endwise of the lever by the fitting of pivot 18 in both the lever and the valve plug, while it is prevented from shifting in the other direction by the straddling of the lever by the upper end of the valve plug. While the valve is thus open water entering the valve chamber has two outlets, the main one being through ports 19 disposed below the level of the roof of the valve chamber while the secondary outlet is upward through the roof of the valve chamber around the valve plug. While the water is flowing past the open valve there is thus a low washing effect at the valve-seat and also a high level washing effect where the plug passes through the chamber roof. The valve is in practice found capable of perfect practical results, as to performance and maintenance, under peculiarly bad water conditions where other valves have given very serious trouble. The upward rush of water through the roof of the valve chamber around the valve plug is prevented from spouting upward by reason of the presence of the umbrella flange. This flange is disposed some distance above the top of the roof hole through which the valve-plug works so as to give at all times a free outlet sidewise to the water passing upwardly around the plug.

I claim as my invention:—

In a ball cock, a valve chamber having a supply inlet and valve seat in its base and an opening concentric therewith in its roof and having a discharge outlet sidewise in its base, a valve-plug with its foot resting upon and closing said valve-seat and having its body projecting through the opening in the roof free of contact therewith, an umbrella flange carried by the valve plug above the annular discharge opening within the roof opening around the valve-plug so as to permit free sidewise discharge of the water passing upwardly through said annular opening, a lever mounted on a fixed pivot and crossing the valve plug at its upper end and having sidewise engagement therewith so that the valve plug may not shift sidewise relative to the lever, and a pivot engaging and fitting the lever and upper end of the valve plug in such manner as to prevent the shifting of the upper end of the valve plug endwise of the lever, combined substantially as set forth, whereby when the valve plug is raised it is freely suspended by its upper end and whereby the flowing water is given a low side outlet at the valve-seat and an upward and sidewise outlet above the valve chamber.

JOHN H. DAVIS.

Witnesses:
JAMES W. SEE,
M. S. BELDEN.