T. BONROE.

BALL COCK FOR WATER CLOSET CISTERNS.

APPLICATION FILED APR. 27, 1908.

960,801.

Patented June 7, 1910.

2 SHEETS—SHEET 1.

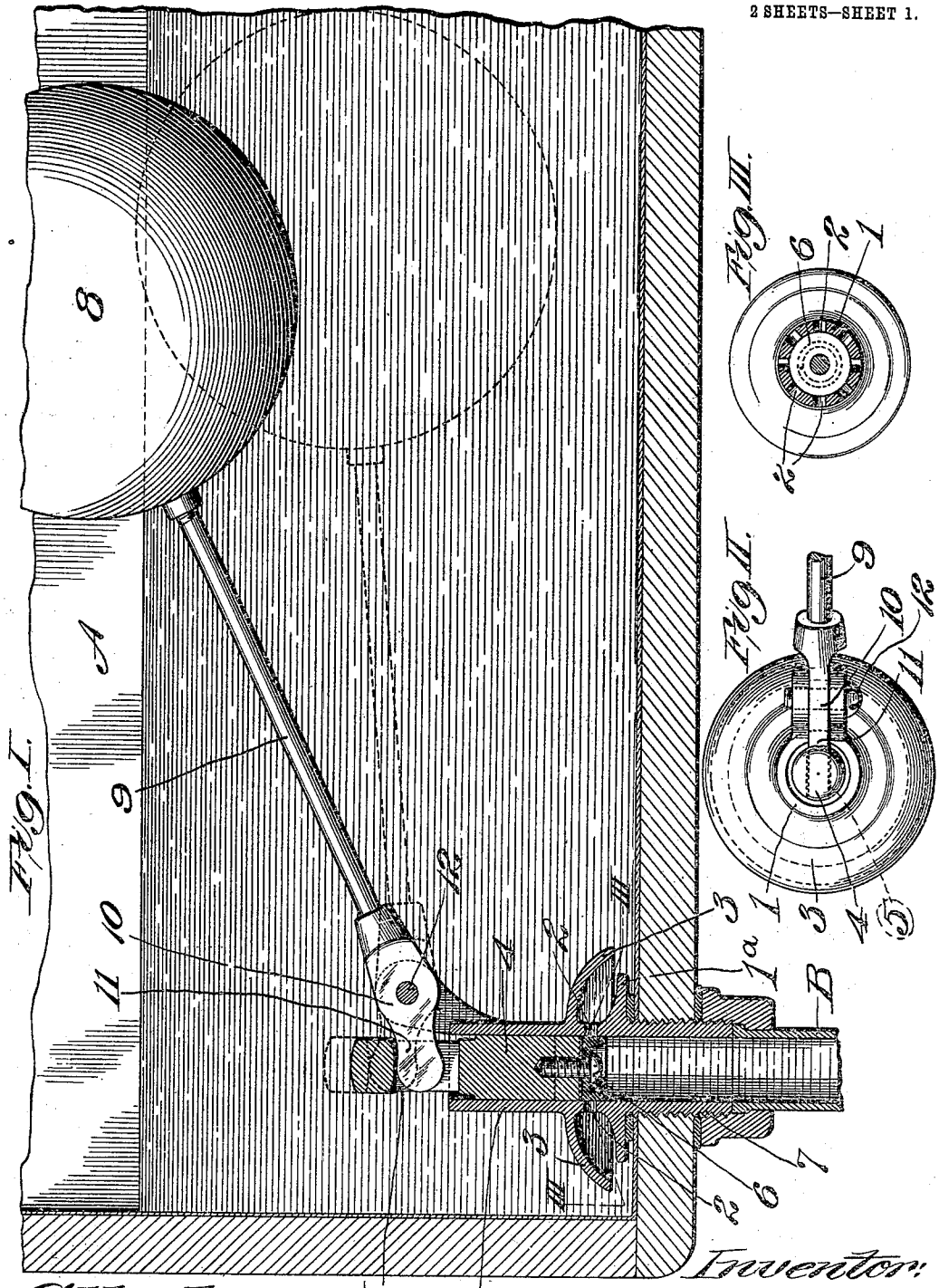

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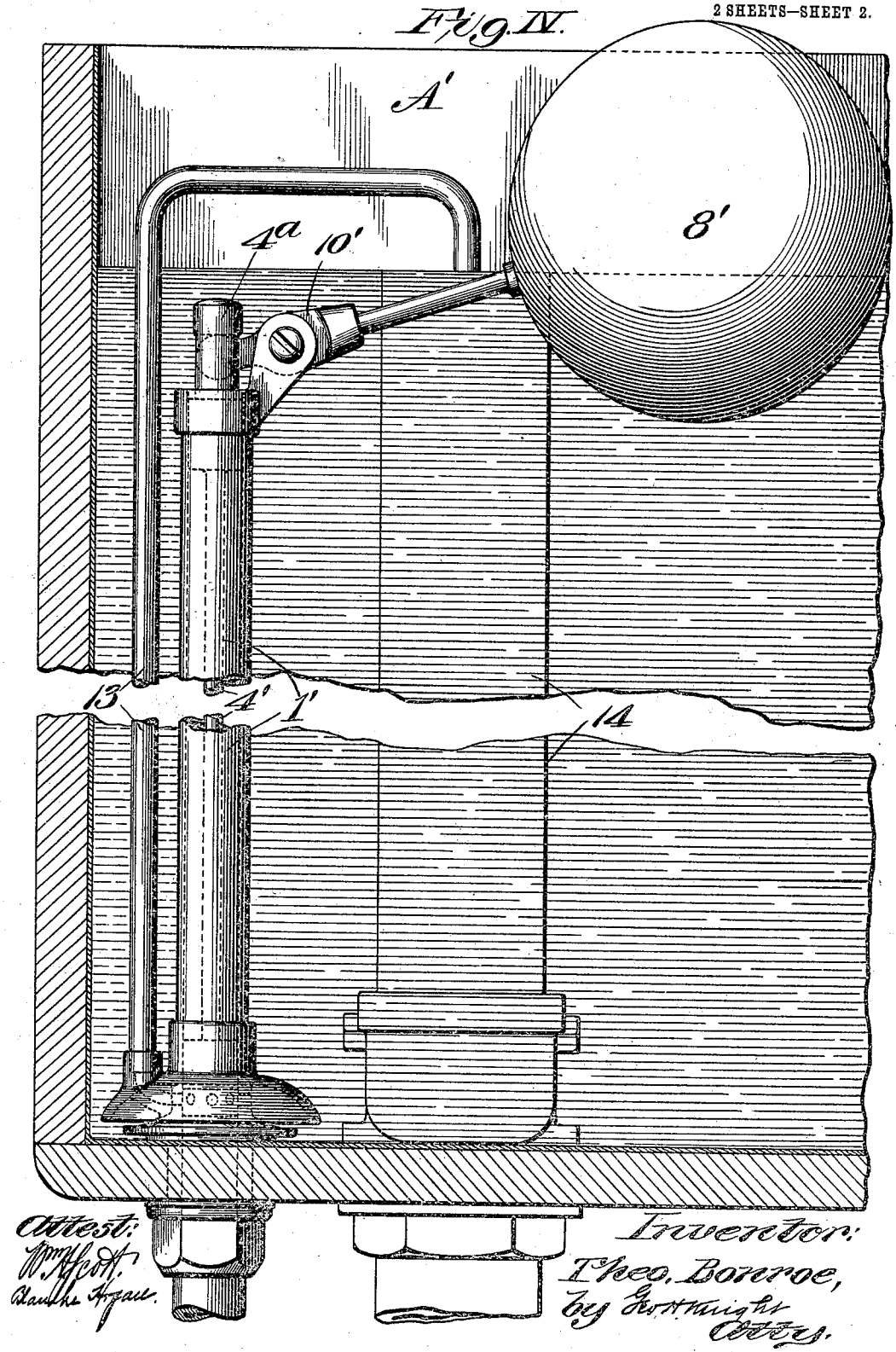
Fig. IV.



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UNITED STATES PATENT OFFICE.

THEODORE BONROE, OF ST. LOUIS, MISSOURI, ASSIGNOR TO N. O. NELSON MANUFACTURING COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION.

BALL-COCK FOR WATER-CLOSET CISTERNS.

960,801. Specification of Letters Patent. Patented June 7, 1910.

Application filed April 27, 1908. Serial No. 429,433.

To all whom it may concern:

Be it known that I, THEODORE BONROE, a citizen of the United States of America, residing at the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Ball-Cocks for Water-Closet Cisterns, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification.

My invention relates to a ball cock for water closet cisterns and it has for its object the production of a cock of this description which is of simple and efficient construction, is not liable to become impaired during service, and by which the water discharged through the cock is directed to the bottom of the cistern in a manner to cleanse said bottom each time that water is delivered through the cock, thereby preventing the accumulation of sediment in the cistern.

Figure I is a vertical section taken through an overhead water closet cistern and my ball cock therein. Fig. II is a top or plan view of the ball cock. Fig. III is a cross section taken on line III—III, Fig. I. Fig. IV is in part a vertical section through a low water closet cistern and in part an elevation of a form of my ball cock suitable for use in a low cistern.

In the accompanying drawings and referring first to Figs. I to III, inclusive: A designates an overhead water closet cistern, and B a water delivery pipe leading to said cistern. 1 designates the tube of a valve housing formed in one piece and having a base collar 1^a seated in the cistern A and having connection with the water delivery pipe B. This housing has arranged in its wall and within the cistern adjacent to the base collar 1^a a plurality of radial ports 2 for the escape of water from the interior of the valve housing after it has risen in said housing from the delivery pipe. The housing 1 is of the same internal diameter throughout its length in order that the interior surface of the housing may serve as a valve seat. 3 is an annular downwardly flaring deflector surrounding the valve housing immediately above its radial ports and forming an annular outlet passage surrounding the base collar 1^a by which the water is deflected over the base collar 1^a against the bottom of the cistern A as it emerges through the radial ports, thereby causing the water to be forcibly driven against the bottom of the cistern for cleansing action. 4 designates a valve stem that is loosely fitted in the tube of the valve housing and protrudes above the upper end of said housing. In this valve stem is a vertical slot 5. 6 is a cup valve of the same diameter as the valve chamber and of suitable material that is attached to the lower end of the valve stem 4, preferably by means of a screw 7 that passes centrally through the valve and into the stem. This cup valve serves to control the radial ports 2 in the valve housing by fitting against the internal valve seat surface of the housing at the location of said radial ports. The valve stem 4 is controlled by a float ball 8. This float ball is carried by a rod 9 that is fitted to a lever member 10, which has an arm 11 loosely positioned in the slot in the valve stem 4. The lever member 10 is pivotally supported intermediate of its ends by a pivot pin 12 mounted in a suitable ear supported by and projecting laterally from the upper end of the valve housing 1.

In the practical use of my ball cock, the valve stem 4 and the cup valve 6, carried thereby, occupy the positions seen in Fig. I, when a quantity of water to be used for closet flushing action is present in the cistern, at which time the cup valve serves to prevent additional inflow of water into the cistern, due to its being seated in contact with the internal surface of the valve housing at a point beneath the radial ports 2. When the water is discharged from the cistern, the float ball descends and the arm 11 of the lever member 10 by acting freely in the slot of the valve stem acts to elevate said stem and carry the cup valve gradually in an upward course with the result of permitting the flow of water through said radial ports from the lower portion of the valve housing toward the deflector and over the base collar 1^a and into the cistern. The water continues to flow into the cistern to fill it and cleanse its bottom surface at the same time until the proper level of water in the cistern has been obtained, at which time the valve stem will have been again lowered under the influence of the float ball and the lever member 10 with which the valve stem coöperates.

In Fig. IV, I have shown my ball cock

constructed in a manner suitable for use in a low water closet cistern. The construction of the cock in this instance differs only from the cock previously described, in that the valve housing is surmounted by a tubular extension 1′ and the valve stem is connected to an extension rod 4′ to the upper end of which is attached a head 4^a that is slotted and receives the arm of the lever member 10′. This construction provides for the float ball 8′ being located at a considerably greater elevation than that at which it is located when used in an elevated cistern. 13 is an after-fill pipe leading upwardly from the valve housing and to the upper end of the flush pipe 14.

It will be perceived that the ball cock herein described, is susceptible of free and easy action at all times and will therefore operate instantly in either direction of movement of the parts. A point to which I desire to direct particular notice, is that the cup valve 6 operates against the internal valve seat surface of the housing 1 and that consequently should the internal surface of the housing become worn away at the location of the radial ports 2, by the friction of water thereagainst, the cup valve will perform its function inasmuch as it is susceptible of moving to a considerable distance beneath the radial ports. It should also be added that if the internal valve seat surface of the valve housing becomes worn beneath the radial ports, thereby permitting water to escape past the cup valve when it extends only slightly beneath the radial ports, the amount of water admitted to the cistern will be increased and the float will cause the valve stem to be lowered to a greater degree, whereby the admission of water to the cistern will be stopped before there has been an objectionable increase of delivery of water into the cistern.

I claim:

A ball cock comprising a housing with a tube of the same internal diameter from end to end and provided with radial ports, and with an annular downwardly flaring deflector surrounding the tube overhanging the radial ports and extending outwardly therefrom free at its outer edge from adjacent parts of the cock, and a valve stem within the tube provided with a cup valve at its lower end of the same diameter as the stem and the peripheral surface of which controls the radial ports.

THEODORE BONROE.

In presence of—
BLANCHE HOGAN,
E. S. KNIGHT.