R. E. CRANE.

WATER CLOSET FLUSH TANK.

APPLICATION FILED MAY 29, 1918.

1,298,012.

Patented Mar. 25, 1919.

2 SHEETS—SHEET 1.

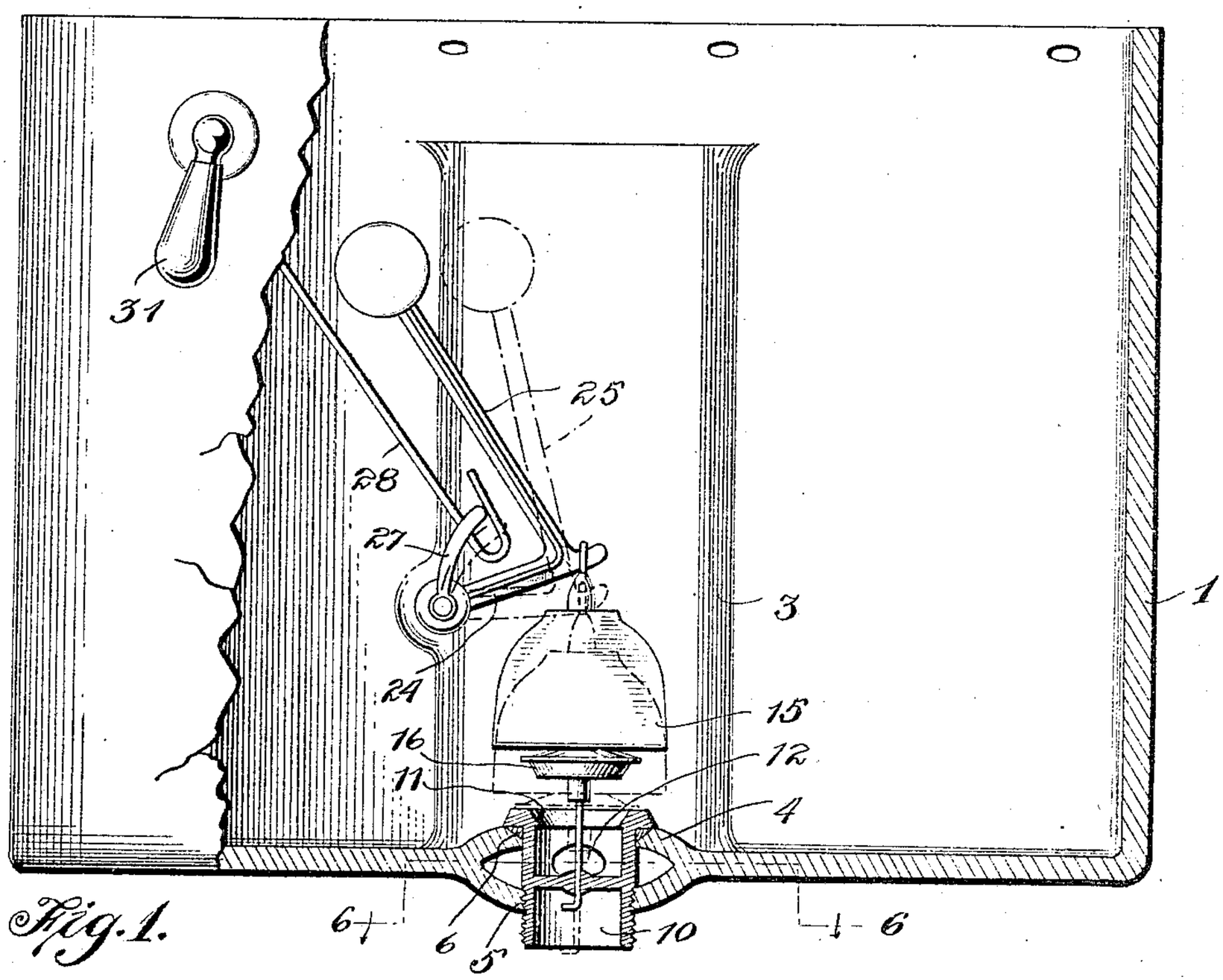

Fig. 1.

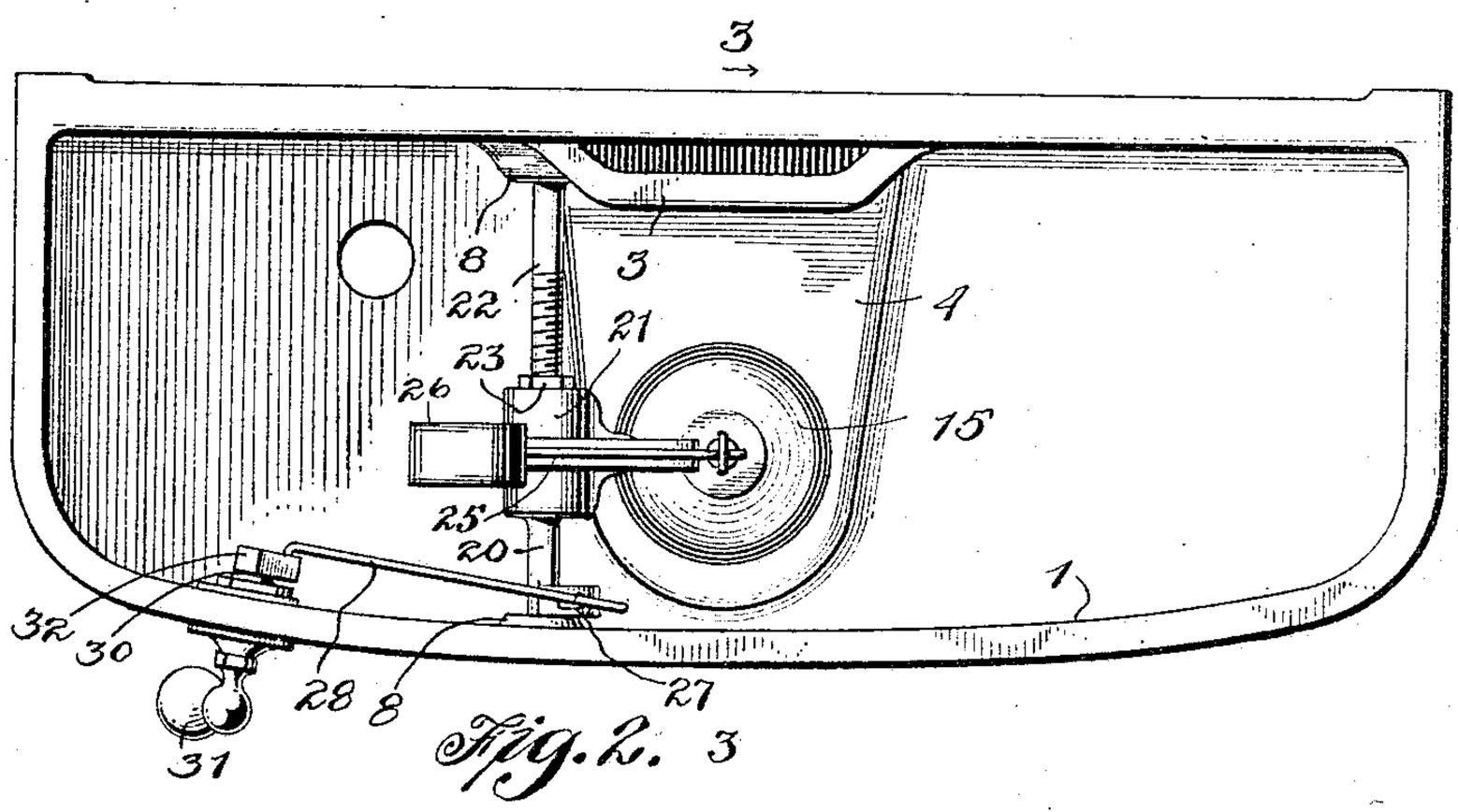

Fig. 2.

Inventor
Raymond E. Crane
By Pennie Goldsborough & O'Neill
Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

R. E. CRANE.

WATER CLOSET FLUSH TANK.

APPLICATION FILED MAY 29, 1918.

1,298,012.

Patented Mar. 25, 1919.

2 SHEETS—SHEET 2.

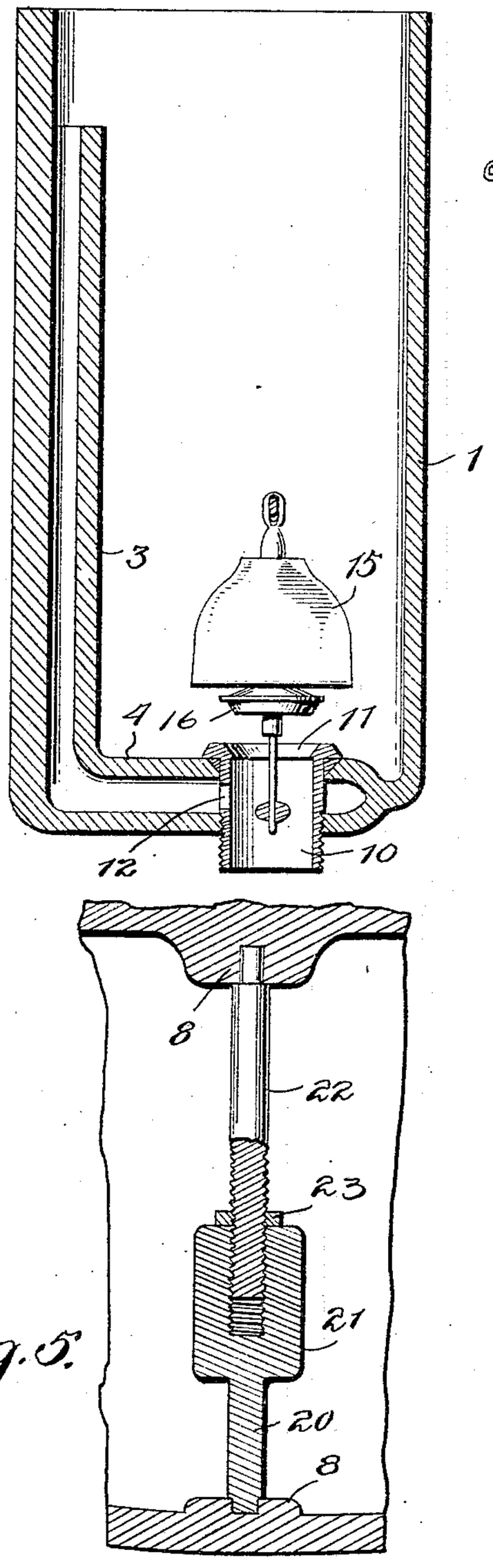

Fig. 3.

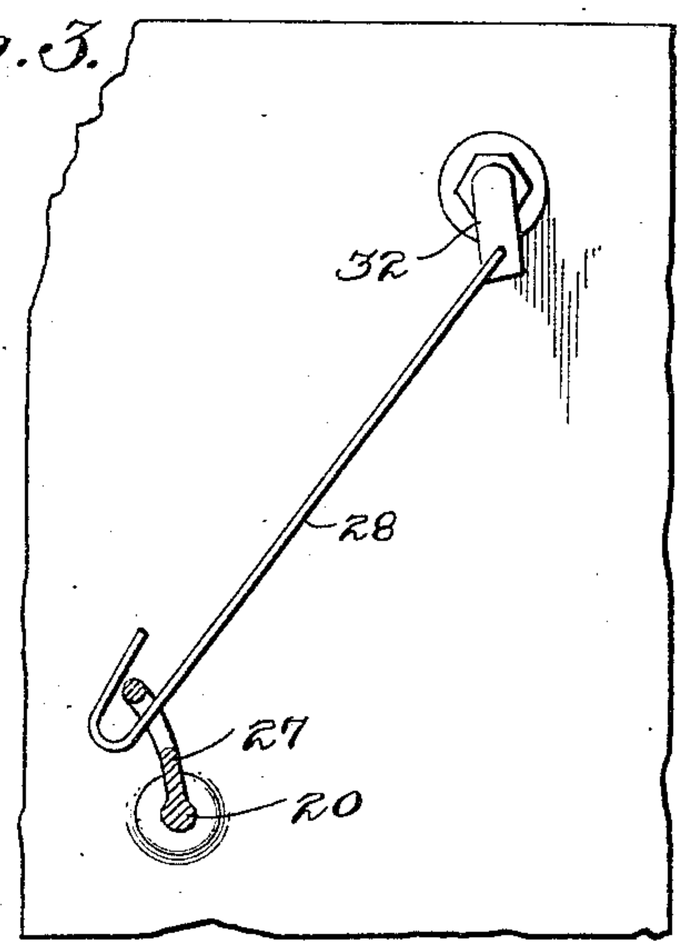

Fig. 4.

Fig. 5.

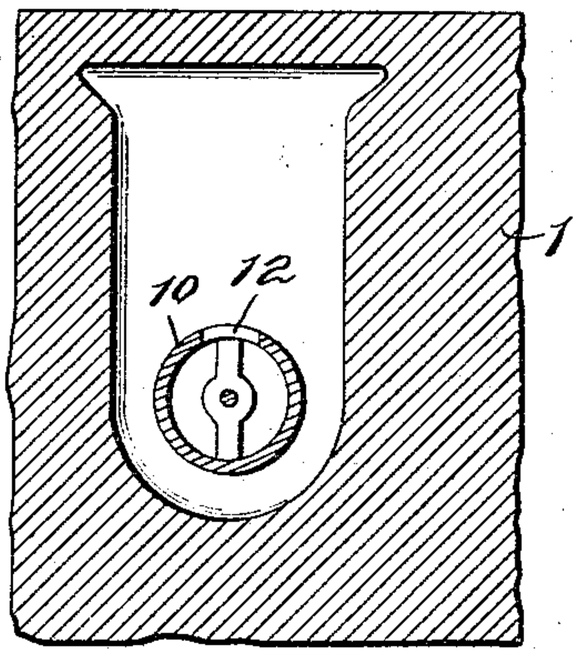

Fig. 6.

Inventor

Raymond E. Crane

By Lemuel Goldsborough & O'Neill

Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

RAYMOND E. CRANE, OF WILMETTE, ILLINOIS.

WATER-CLOSET FLUSH-TANK.

1,298,012. Specification of Letters Patent. Patented Mar. 25, 1919.

Application filed May 29, 1918. Serial No. 237,254.

To all whom it may concern:

Be it known that I, RAYMOND E. CRANE, a citizen of the United States, residing at Wilmette, county of Cook, State of Illinois, have invented certain new and useful Improvements in Water-Closet Flush-Tanks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in flush tanks for water closets and the like, and has for its object to provide a tank, preferably of molded china or earthenware, provided with an overflow formed as an integral portion of the tank and so disposed with respect to the bottom of the tank that the valve seat fitting of the discharge may be located substantially flush with the bottom of the tank to effect the complete drainage of the latter, said discharge being controlled by a special form of counterweighted valve mounted upon a shaft or spindle journaled in bearings formed in the tank walls, the counter-weight tending to retain the valve in its open and closed positions.

The invention is illustrated in the accompanying drawings, in which,

Figure 1 is an elevation, partly in section, of a tank and its fittings, the inlet valve being omitted to avoid confusion.

Fig. 2 is a plan view of the tank.

Fig. 3 is a sectional view on line 3—3 of Fig. 2.

Fig. 4 is a fragmentary view showing the operating connections.

Fig. 5 is a detail plan, partly in section, of the valve-carrying spindle.

Fig. 6 is a section on line 6—6 of Fig. 1.

Referring to the drawings, 1 indicates the body of the tank involving front, rear and side walls and a bottom, preferably formed of earthenware, pottery, china or the like, as an integral structure, which is first formed or molded from the material in a green state and subsequently baked and glazed, as is usual in the manufacture of articles of this general character. The open top of the tank is to be provided with a slab-like closure or lid (not shown) which may be formed of the same material as the body of the tank or any other suitable material. Integrally connected with the inner face of the rear wall of the tank is an arch-shaped member 3 which forms with said rear wall a conduit open at the top at a point below the upper edge of the tank, and communicating through an opening in the bottom of the tank with a conduit formed by an arch-shaped member 4 formed integrally with the bottom of the tank, the two communicating arch-shaped members constituting an overflow which is thus formed as an integral element of the tank.

The bottom of the tank is provided with a beveled opening 6 in vertical alinement with an opening 5 in the bottom of conduit section 4, said registering openings being adapted to receive an outlet coupling 10 provided at its upper end with a valve seat 11. Said coupling is also provided with a lateral opening 12 which communicates with the interior of the conduit section 4 to permit any overflow to escape into the coupling and the discharge pipe.

Formed integrally with opposite walls on the tank 1 and preferably on the front and rear walls thereof are journal bearings 8, 8, adapted to receive the opposite ends of a horizontal spindle or shaft, which carries the flush valve. Said shaft consists of two sections 20 and 22, the former of which is provided with an enlarged internally screw-threaded socket member 21 at one end adapted to receive the screw-threaded end of the member 22 so that when the two members 20 and 22 are adjusted in an axial direction, the shaft as a whole will be lengthened or shortened as the case may be. By screwing the shaft section 22 into the socketed end of section 20, the length of the shaft may be reduced sufficiently to permit the ends to be engaged with the journal bearing sockets 8, 8, after which the end 22 is screwed outwardly until both ends are journaled in the corresponding sockets 8. The shaft sections are then locked together by a set nut 23.

Connected to the shaft section 20 is an elbow lever having arms 24 and 25, at the end of arm 24 of which is connected a hollow valve body 15 carrying at its lower portion a sealing washer 16 which coöperates with the valve seat 11 on the inner end of coupling 10 to close the outlet to the tank. The lever arm 25 carries on its end a counterweight 26, said lever arm 25 being so disposed that when the shaft 20—22 is rocked, the counter-weight 26 moves to one side or the other of the longitudinal axis of the

shaft so that the counter-weight tends to maintain the valve 15 in both open and closed positions.

The shaft 20 is rocked by means of a crank arm 27 connected by a link 28 with a crank arm 32 mounted on a spindle 30 journaled in a suitable bushing in the front wall of the tank and having on its outer end a handle or hand piece 31, so that when said handle is moved in either direction, the shaft 20 is rocked to unseat the valve 15 and also to swing the counter-weighted lever 25 to the left of a vertical plane through the longitudinal axis of the shaft 20, which position of the counter-weight tends to retain the valve in open position. After practically all of the water is discharged from the tank and the buoyant effect of the water on the hollow valve 15 ceases, the weight of the valve and the suction produced by the final flow of the water causes the valve to descend and engage the seat 11 on the end of the coupling 10, thereby rocking the shaft 20 in a right hand direction and causing the counter-weighted lever 25 to move to the right of a vertical plane through the longitudinal axis of the shaft, as indicated in dotted lines in Fig. 1, said counter-weight thereby serving to force the valve firmly to its seat and to retain it in this latter position.

It will be noted that the link 28 is connected to the crank arm 27 by means of an open hook on the end of said link which engages an eye in the end of the lever forming a lost-motion connection, and handle 31 and its attached crank 32 is freely rotatable. This arrangement admits of the handle being operated and even being turned completely around, without imposing any undue strains on the mechanism. A relatively small movement of the handle in either direction is sufficient to rock the shaft 20 to unseat the valve and cause the counter-weighted end of the elbow lever 24—25 to pass to the left of the vertical plane through the longitudinal axis of the shaft, after which the free opening of the flush valve is effected automatically by the counter-weighted elbow lever. When the handle 31 is released it immediately moves back to its normal position.

The construction as described is exceptionally simple and can be produced at a minimum expenditure of labor and expense. The arrangement of the various parts insures a positive and quiet action of the flush valve at all times, and renders a complete drainage of the tank at each flushing operation feasible and effective to carry out all sediment, which might otherwise tend to collect in the tank. The formation of the overflow as an integral portion of the tank body, in the relation shown, not only avoids the necessity of supplying the troublesome and expensive overflow, which usually constitutes a part of the flush valve fitting, but enables the coupling constituting the discharge from the tank to be so located that the valve seat on the upper end thereof does not project materially into the tank, thereby insuring complete drainage.

What I claim is:

1. A flush tank provided with a valve seat, a flush valve coöperating therewith, a counter-weighted rock lever for holding said valve in open and closed position, a handle mounted in the tank wall for complete rotation, and a lost-motion connection between the handle and the lever, whereby a slight movement of the handle initiates the movement of the rock lever to unseat the valve, further movement being effected by the counter-weight without strain on the handle and its connections.

2. A flush tank provided with a valve seat, a flush valve coöperating therewith, a bell crank lever connected to the valve and provided with a counter-weight to lift the valve from its seat after an initial movement has been imparted thereto, a handle mounted in the tank wall for complete rotation, and a lost-motion connection between the handle and the lever to permit free movement of the handle after the initial valve unseating movement.

3. A flush tank for water closets and the like having journal bearings in the interior faces of opposite walls thereof, a shaft mounted in said bearings, an elbow lever on said shaft, a flush valve connected to one arm of said lever, a counter-weight connected to the other lever arm in such relation that the counter-weight moves transversely of the axis of the shaft, and means to rock the shaft to open the valve.

4. A flush tank for water closets and the like having journal bearings in the interior faces of opposite walls thereof, a longitudinally adjustable shaft mounted in said bearings, an elbow lever on said shaft, a flush valve connected to one lever arm, a counter-weight connected to the other lever arm in such relation that the counter-weight moves transversely of the axis of the shaft, and means to rock the shaft to open the valve.

5. A flush tank provided with a valve seat, a flush valve coöperating therewith, a rock lever mounted within the tank and connected with the valve, an operating handle mounted in one wall of the tank for complete rotation, a pull rod having a pivotal connection with the handle and a sliding lost motion connection with the lever, said rod being adapted to initiate the movement of the lever and a counterweight on the lever to cause the continuation of its movement independent of any movement of the pull rod.

6. A flush tank, comprising a flush valve,

a counter-weighted elbow lever connected to said valve adapted to retain the valve in its open and closed positions, a shaft to which one free end of said elbow lever is connected, and a freely rotatable handle journaled in the tank wall, and a link having a freely sliding connection with the shaft and connecting the latter with said handle.

7. A flush tank, comprising a flush valve, a rocking lever for operating the same, and a rotatable shaft to which said lever is connected, said shaft including two longitudinally adjustable sections, and means for locking them in adjusted positions, said tank having journal bearings in the interior faces of opposite walls thereof to receive the ends of the shaft.

In testimony whereof I affix my signature.

RAYMOND E. CRANE.

Witness:

ANNIE M. MELLEN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."