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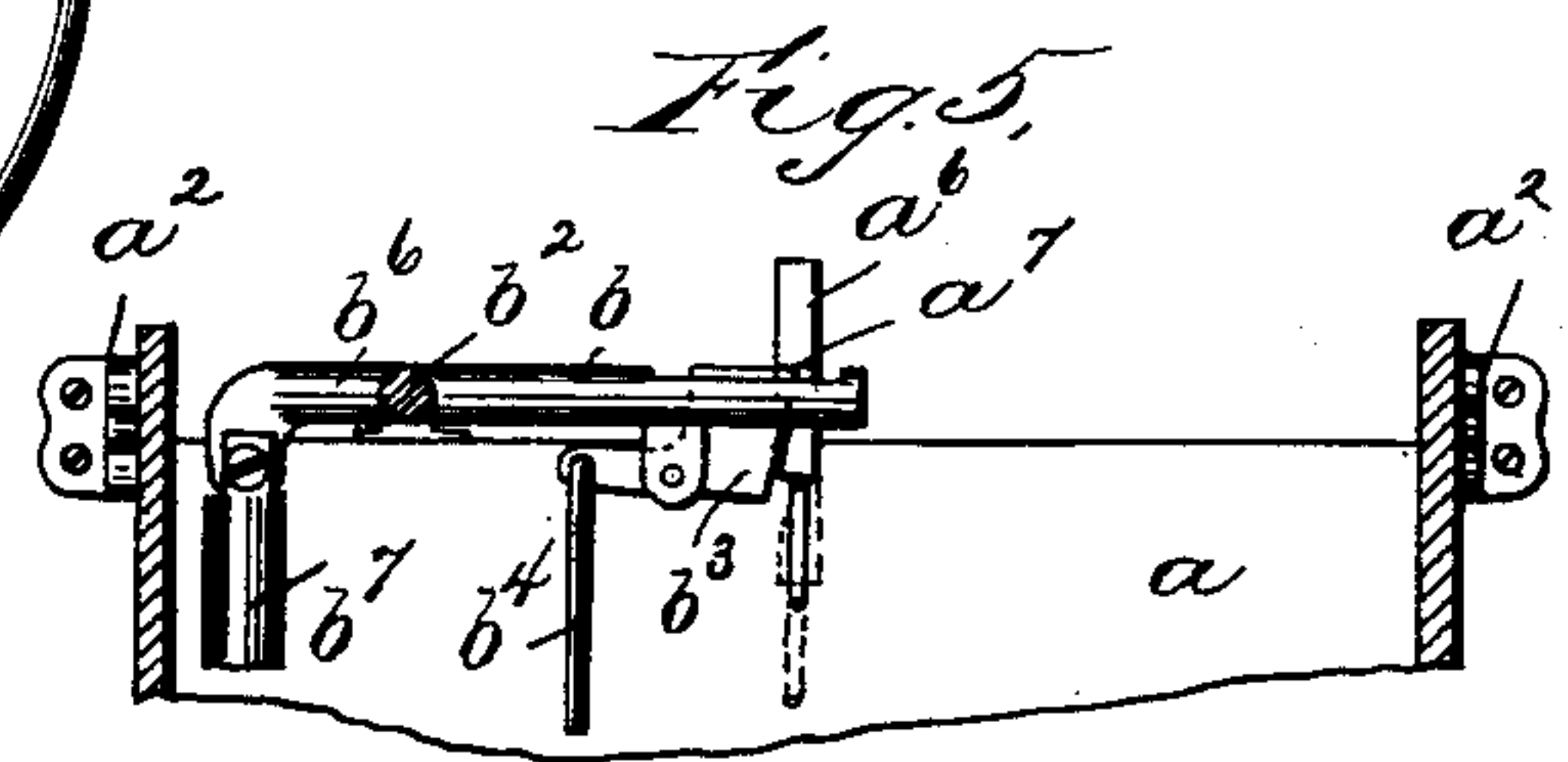
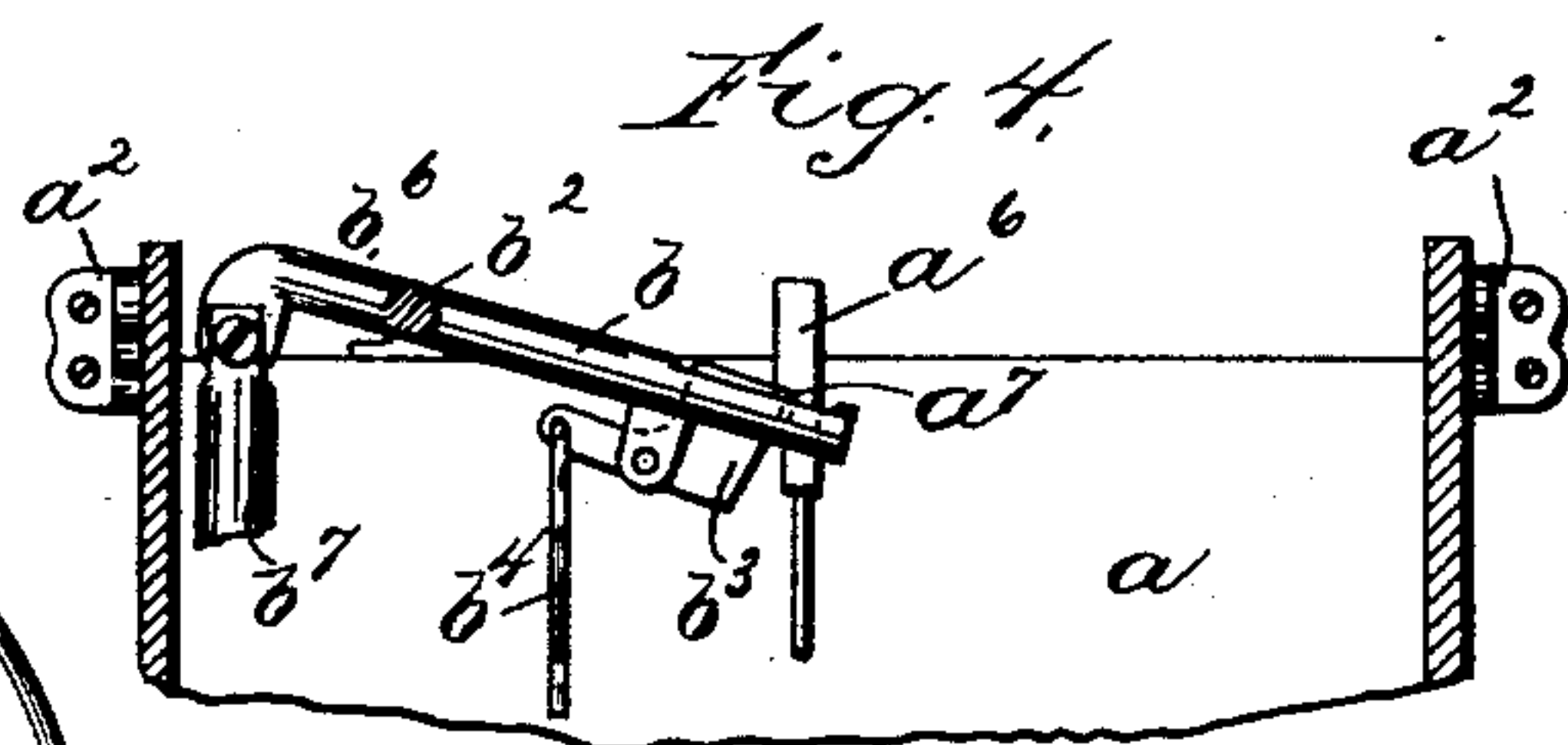
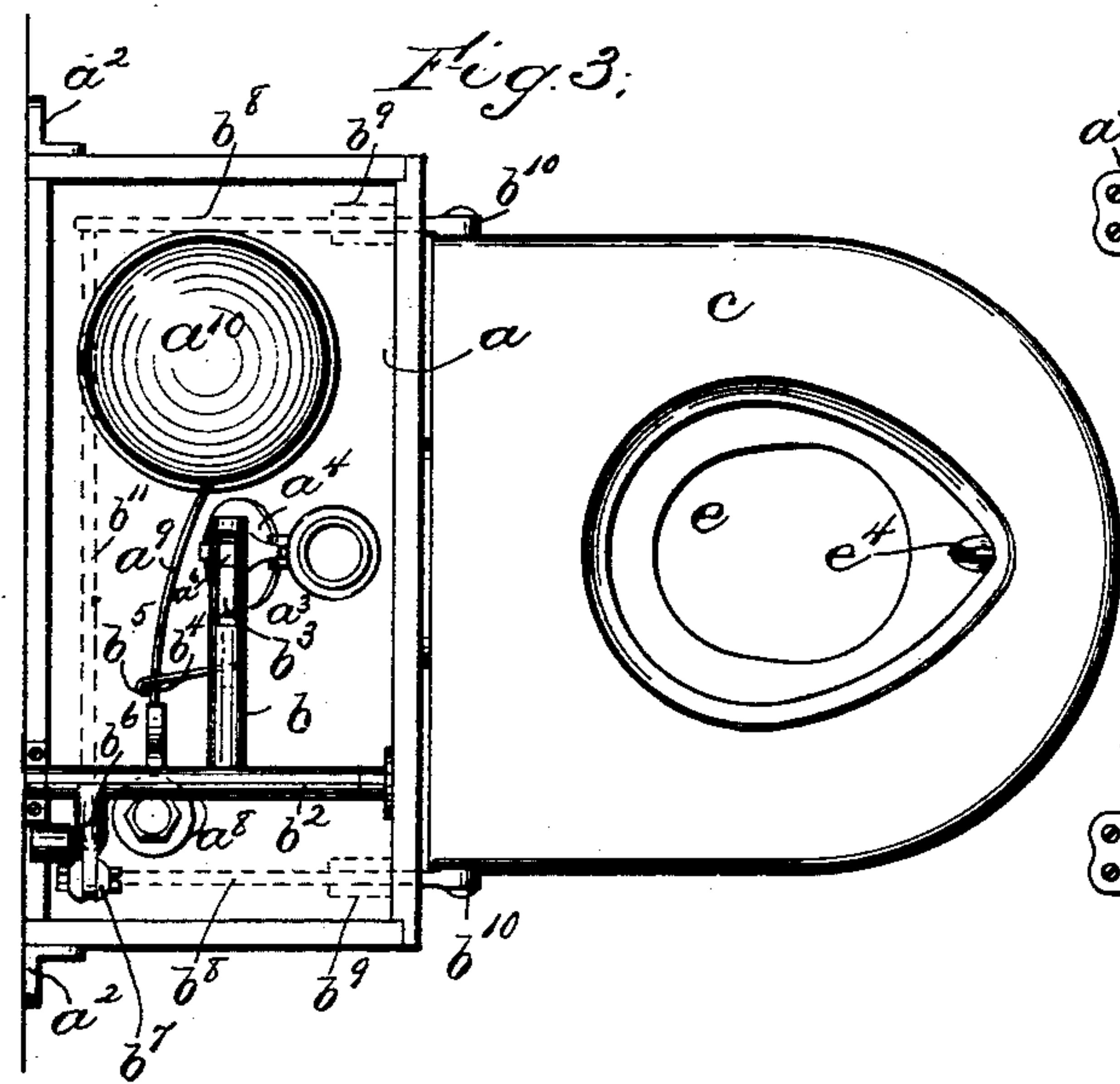
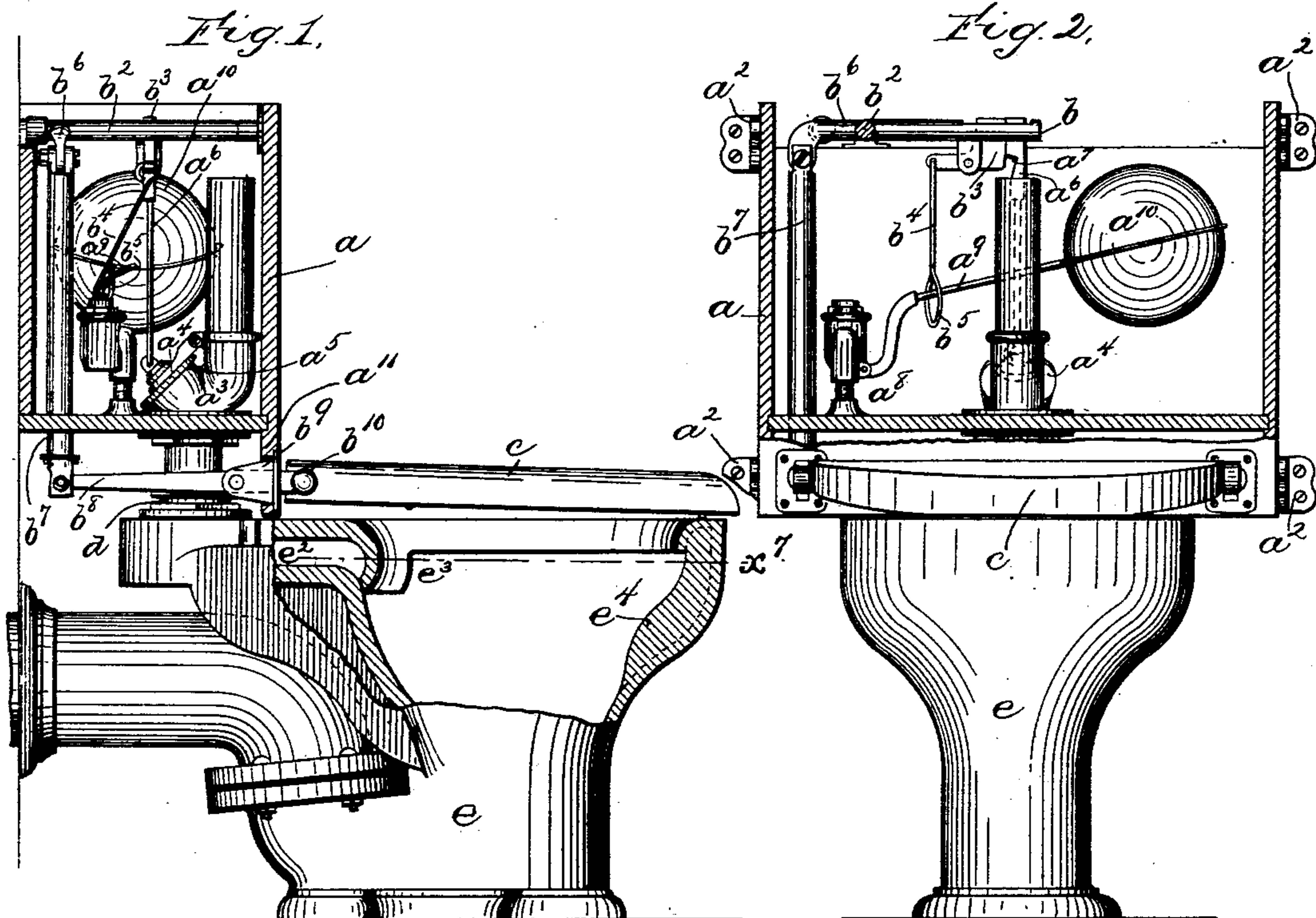
2 Sheets—Sheet 1.

W. SCOTT.

FLUSHING DEVICE FOR WATER CLOSETS.

No. 541,215.

Patented June 18, 1895.



Witnesses
Jas. J. Maloney
H. J. Livermore

Inventor,
William Scott,
by J. P. Linnane
Att'y.

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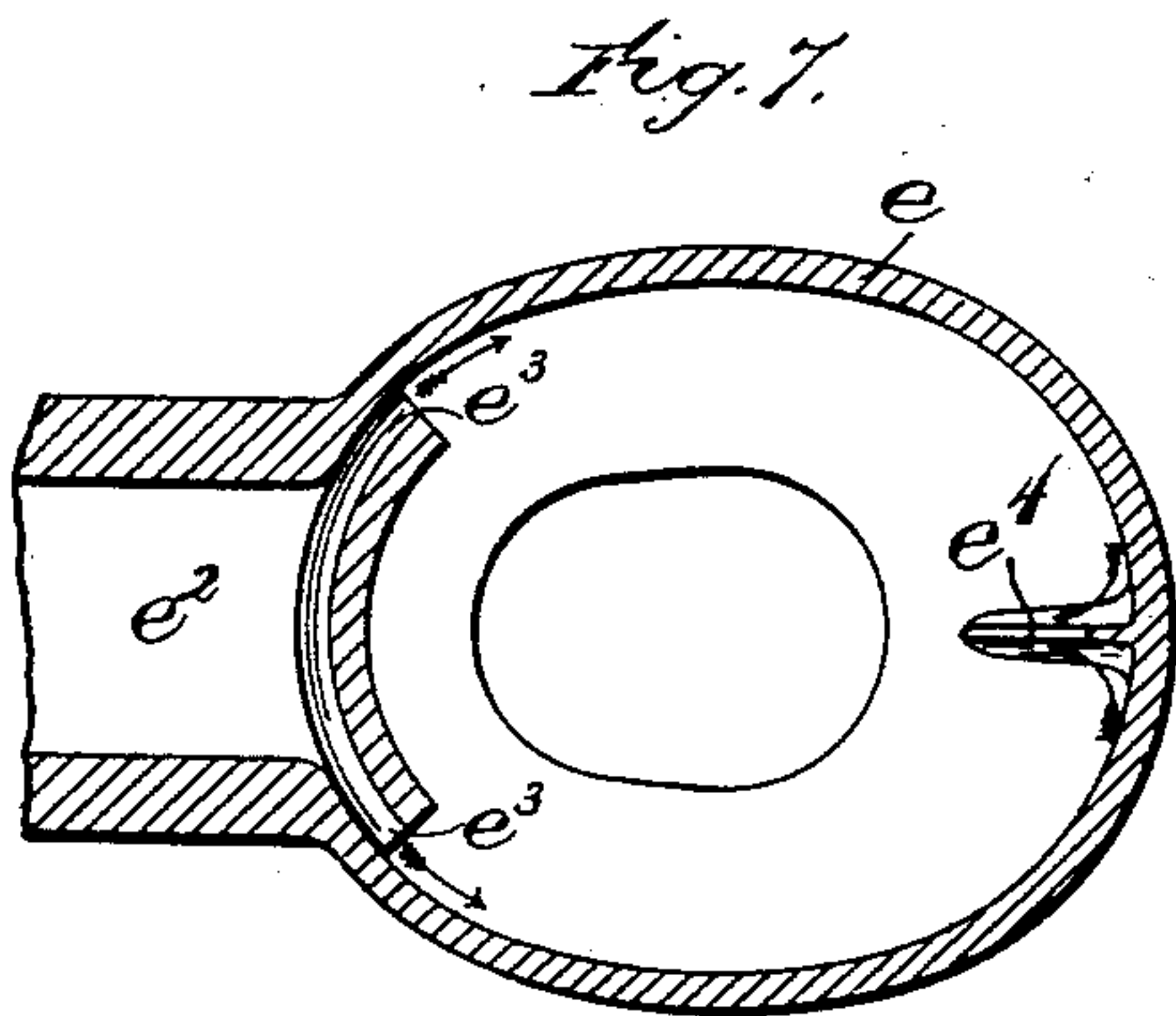
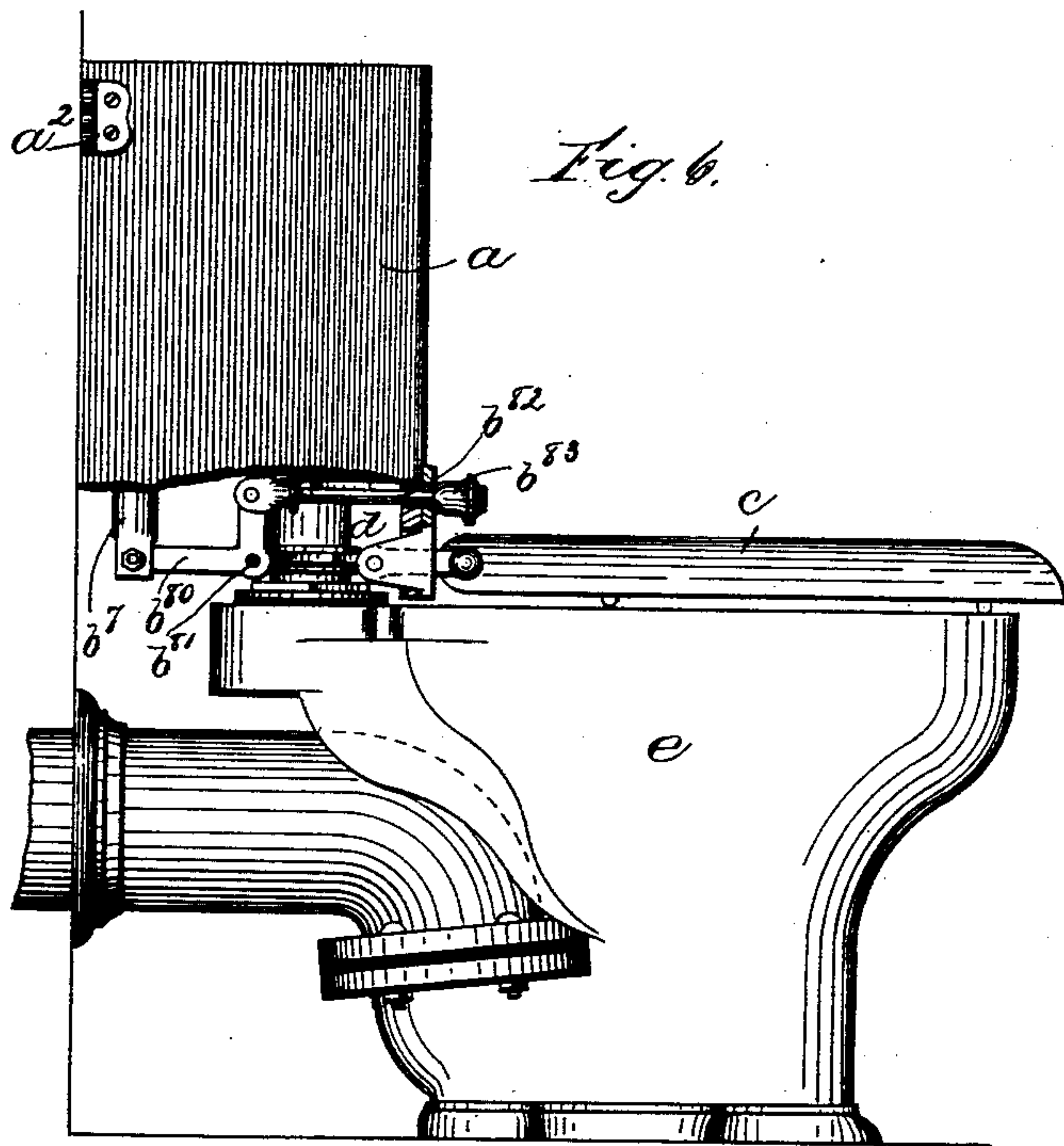
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UNITED STATES PATENT OFFICE.

WILLIAM SCOTT, OF MEDFORD, ASSIGNOR TO THE DALTON-INGERSOLL COMPANY, OF BOSTON, MASSACHUSETTS.

FLUSHING DEVICE FOR WATER-CLOSETS.

SPECIFICATION forming part of Letters Patent No. 541,215, dated June 18, 1895.

Application filed February 11, 1895. Serial No. 538,002. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM SCOTT, of Medford, county of Middlesex, State of Massachusetts, have invented an Improvement in Flushing Devices for Water-Closets, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The present invention relates to water-closets, and is embodied in improved means for operating the flushing valve, whereby substantially the same amount of water is discharged at each use of the closet, and also in a novel construction of the tank and means for automatically actuating the flushing valve.

The operating device of the present invention may be applied to any tank such as is commonly employed, and consists in an arm or lever having a latch adapted to engage the valve or a connection therewith when the said lever is moved from its normal position, in which it is retained by some retractive force as that of a weight or spring, and a device for subsequently tripping the latch and disengaging the valve from its lever. As soon, therefore, as the lever is released after having been thus moved it returns to its normal position, carrying with it the valve which is then connected with it by means of the latch above mentioned. The apparatus is of course so arranged that this movement of the valve unseats it, allowing the water to be discharged into the bowl. In order to restore the valve to its normal or closed position after a predetermined amount of water has been discharged, it is necessary to trip or disengage the latch upon the operating lever, and as herein shown such disengagement depends upon the fall of level of the water in the tank, said latch being controlled by a float which may be the float which controls the inlet to the tank, so that when the said float has fallen a certain distance owing to the discharge of water from the tank, it will trip the latch, allowing the valve to return to its seat, against which it is normally held by force of gravity or in any of the ordinary ways. Thus when the lever is once operated the valve is placed beyond the control of the operator and cannot be closed

until the latch is disengaged by the tripping device and it then closes automatically. It is obviously not essential that the tripping device should be controlled by a float, however, since other means might in some cases be substituted with equally good results. While, as has been stated, any of the usual forms of tanks may be used with this operating device, together with any suitable actuator, it is preferable to employ a novel form of tank, which, in combination with a new and improved automatic actuator, also forms a feature of the present invention. The main portion of the said tank may be constructed in the ordinary way, but the front and side walls thereof, in accordance with the invention are extended below the bottom thereof, and the tank is adapted to be supported directly over a rear extension from the bowl in which the service pipe is formed; the supports consisting preferably of brackets upon the wall of the room in which the closet is situated. The outlet of the tank is then coupled directly to the said service pipe, the couplings being readily accessible for repairs, and at the same time hidden from view. The actuating device is then supported or given a suitable bearing in the extensions below the bottom of the tank, the operating connections thereof thus being inclosed and hidden from view. The apparatus is thus all contained within a very small space and presents a neat and finished appearance.

The distributing device herein shown is of novel construction and consists of two nozzles opening in opposite directions from the mouth of the service pipe, one of said nozzles being at one side of the bowl, and the other at the other side, so that a stream of water from each nozzle is directed, one along and against one side of the bowl, and the other along and against the other side. At the front of the bowl directly opposite the flushing pipe a deflector is provided consisting of a rib projecting inward from the inner surface of the bowl and extending from the top of said bowl to the surface of the water therein, when at its normal level, so that the entire volume of water issuing from said nozzles after passing around the sides of the bowl is intercepted thereby and directed outward from the walls of the

bowl to the center thereof, so that substantially the whole volume of water falls directly into the center of the bowl.

Figure 1 is a vertical section of the tank and upper part of the bowl looked at from one side. Fig. 2 is a vertical section of the tank looked at from the front, the bowl and seat being shown in elevation. Fig. 3 is a top plan view; Figs. 4 and 5, details of the valve-actuating lever and latch, showing in full and dotted lines the positions thereof during operation. Fig. 6 is a modification; and Fig. 7 is a section of the bowl on line x^7 , Fig. 1.

The tank a is preferably mounted back of the bowl and directly over an extension therefrom in which is formed the service pipe, the said tank being preferably supported by means of brackets a^2 fastened to the wall. To control the supply of water from the tank to the bowl, a valve a^3 is provided at or near the bottom of the tank, the said valve being of any usual construction, but preferably adapted to be opened by an upward movement of the valve proper a^4 which lifts it from its seat a^5 upon which it is normally held in any suitable way, by its own weight for example, as shown, aided by the pressure of the water in the tank.

In order to operate the valve, a stem or lifting rod a^6 is provided extending upward therefrom toward the top of the tank through a guide-way consisting of a slot in a movable lever b mounted on a rock shaft b^2 and connected to an actuating device which will be hereinafter described. The said lever b is normally disconnected from the said stem a^6 but is provided with a latch b^3 adapted when the said lever b is rocked on its shaft b^2 to engage a shoulder a^7 formed in the stem a^6 the position thereof when thus engaged being shown in Fig. 4. When the lever b thus engaged with the valve stem a^6 is returned to its normal position as shown in full lines Fig. 5, it carries with it the said stem a^6 thus opening the valve a^3 and allowing the water to discharge from the tank into the bowl. To close the valve, therefore, after the bowl is flushed it is necessary to provide means for subsequently disengaging it from the lever b , by which it is held open as above described. As shown herein, this is accomplished by connecting the outer end of the latch, as by a link b^4 , to a float which may be and preferably is that which controls the inlet a^8 so that as the said float falls owing to the discharge of water from the tank it will trip the latch and permit the valve to close. The link b^4 is preferably arranged to be engaged by the float only after a predetermined amount of water has been discharged from the tank and for this purpose is provided at its lower end with a loop b^5 extending around the stem a^9 operated by the float a^{10} . Thus as the water discharges from the tank so that the float a^{10} sinks toward the bottom thereof, the stem a^9 will finally engage with the loop b^5 thus tripping the latch b^3 and releasing the stem a^6 as shown in dotted lines

Fig. 5, so that the outlet valve a^3 will automatically close.

By the construction herein shown a positive and certain engagement and disengagement of the stem or lifting rod by the latch as well as freedom of movement of the valve stem when disengaged are secured, as will be seen by reference to Figs. 4 and 5. Referring to Fig. 4, as the lever b is rocked on its pivot the end wall of the guide slot therein through which the lifting rod or stem a^6 passes engages the said lifting rod and prevents it from receding from the latch and after the said latch reaches and drops under the shoulder a^7 the lifting rod is prevented from slipping off the said latch, being positively held between the end of the latch and the end guide wall in the lever until released by an upward and inward movement of the end of the latch engaged with the valve stem. In order to insure a positive disengagement of the stem by the latch the latter is provided with a heel or extension below the shoulder or lifting surface thereof, which, as will be seen by reference to Fig. 5, engages a portion of the said stem a^6 below the shoulder a^7 so that when the latch is turned on its pivot by the descent of the float a lateral movement of the valve stem toward the latch is prevented thus insuring the withdrawal of the latch from the shoulder a^7 .

The said valve operating device may be actuated in any suitable way, it being desirable however, that the actuating means be so arranged that the initial movement thereof shall not in itself operate the valve but merely bring the main operating lever into engagement with the valve stem so that the return of said lever to its normal position automatically effected by a weight or spring, shall open the valve and hold it open until released, as above described. It is preferable, however, to use a novel automatic actuating device which forms a feature of the present invention and which may be described as follows: A lever arm b^6 extending outward from the rock shaft b^2 opposite the main lever arm b is connected by a link b^7 to a lever b^8 pivoted in a lug b^9 in the front wall of the tank a which is extended below the bottom thereof as shown in Fig. 1, and the outer end of said lever b^8 is connected by a hinged joint b^{10} to the rear end of the water closet seat c . The said lever b is normally held in the position shown in Fig. 2, by any suitable means, preferably by making the link b^7 of sufficient weight to counterbalance the said lever b and also the weight of the rear end of the seat c the said rear end being thus supported as shown upon the hinges b^{10} somewhat above the level of the bowl, while the front end thereof rests upon the edge of the bowl itself. When, therefore, the said seat c is depressed by weight or pressure thereon, the lever or levers b^8 (there being preferably one at each side of the seat, connected together at their ends by a rod b^{11} as shown in Fig. 3) are rocked in their pivotal

bearings thus lifting the rod b^7 and lowering the lever b until the latch b^3 engages with the shoulder a^7 as hereinbefore described. The operating device is thus brought to its operative position, so that it will open the valve as soon as the pressure upon the seat c is relieved, this being accomplished as already described by the return of the lever b thus released, to its normal position; and the valve thus opened will then be closed also automatically when the proper amount of water has been discharged from the tank into the bowl. It is not however essential that the valve operating means should be actuated by a depression of the seat, as it may be readily arranged to be actuated otherwise, for example, manually as illustrated in the modification Fig. 6, in which an elbow lever b^{80} pivoted at b^{81} is connected with a rod b^{82} which may be supported or given a bearing in the extension of the front wall of the tank a and provided with a knob or handle b^{83} , by which the arm b is lowered as above described, so that the automatic operation of the flushing device takes place when the said handle is released.

The tank a when constructed in accordance with the present invention is provided as has been hereinbefore mentioned, with the extensions a^{11} from the bottom of said tank to the upper surface of the bowl thus forming an inclosed space or chamber within which are contained the couplings d through which the outlet from the tank is connected to the service pipe of the bowl. The lever connections from the valve operating device are also mainly contained within the said chamber the walls of which may be utilized as shown to afford a support or bearing for the said levers, and all the operative parts are thus closed in and hidden from view, while, since the tank may be supported directly over the rear extension from the said bowl, the whole apparatus is compact and occupies the least possible space, and may be very conveniently installed.

In order to obtain an efficient distribution of the water admitted to the bowl when flushing the same, a service pipe e^2 which is preferably integral with the bowl e , is provided in accordance with the present invention with two outlets or nozzles e^3 see Figs. 1 and 7, one at each side of the said service pipe and opening adjacent to and substantially parallel with the inner walls of the bowl. Water admitted to the service pipe therefore is discharged through the said nozzles e^3 flowing around the inner walls of the bowl in the direction of the arrows, Fig. 7, from the back to the front of the bowl. At the front of the bowl in the middle thereof and extending inwardly from the inner wall is a deflector e^4 consisting preferably of a rib projecting inward from the front inner surface of the bowl across the path of the streams discharging from the nozzles e^3 , extending substantially from the top of the bowl to the surface

of the water therein when at its normal level. When therefore, the said streams reach the said deflector, they are diverted thereby toward the middle of the bowl, as indicated by the arrows, mingling and discharging directly over the center thereof. The water issuing from the nozzles e^3 is not confined by any pipe or passage at the upper portion of the bowl so that by force of gravity the streams widen; and when they reach the deflector and are turned inward thereby a considerable volume of water is dropped bodily directly into the center of the bowl. Substantially the entire volume of water is thus directed to the center of the bowl and it is thus rendered immaterial if one of the said nozzles e^3 is slightly larger or smaller than the other as may sometimes be the case owing to the warping of the earthenware in baking, or to other causes, although it is intended that they should be of substantially the same size and discharge the same amount of water. Without the deflector e^4 however, if such irregularity existed, it is obvious that the stream from the larger opening meeting the stream from the smaller opening would overbalance it, so to speak, to some extent, so that the combined volume of water, instead of falling in the center of the bowl as is most desirable, would be diverted therefrom, falling to one side or the other, and the flushing would not be so effective as when the whole volume of water from the service pipe falls directly into the middle of the bowl.

While the flushing device forming the main feature of the present invention has been herein described in connection with a novel form of tank and actuating means, it is obvious that it may be equally well applied to tanks of ordinary construction, and actuated in any of the usual ways. It is not therefore intended to limit the invention to a combination of the said operating device with any specific form of tank or actuating means; nor is the invention limited specifically to that form of the operating device itself, herein shown, since modifications may obviously be made therein.

I claim—

1. In a flushing device for water closets, the combination with a valve having an upwardly extending stem or lifting rod and a shoulder on the said lifting rod, of a lever provided with a guide for said lifting rod, a latch pivoted upon said lever and adapted to engage said shoulder to lift the valve, and means for tripping the said latch, substantially as described.

2. In a flushing device for water closets, the combination with a valve having an upwardly extending stem or lifting rod and a shoulder on the said lifting rod, of a lever provided with a guide for said lifting rod, a latch pivoted upon said lever and adapted to engage said shoulder to lift the valve, and a link connected with said latch and adapted to be en-

gaged by a float whereby said latch is tripped when said float has reached a predetermined level, substantially as described.

3. The combination with the valve having
5 an upwardly extending lifting rod or stem and a shoulder on said lifting rod below the upper extremity thereof, of a lever having a guideway through which said lifting rod extends, a latch pivotally supported on the said
10 lever, and normally engaging said lifting rod above the shoulder thereof, but adapted when said lever is moved downward with relation to said lifting rod to engage said shoulder, means for moving said lever downward with
15 relation to said lifting rod and for restoring said lever to its normal position when released, and a tripping device for said latch adapted to operate when said lever is in its normal position, substantially as described.

20 4. In a flushing device for water closets, the combination with a valve having an upwardly extending stem or lifting rod and a shoulder on the said lifting rod, of a lever provided with a guide for said lifting rod, and a latch
25 pivoted upon said lever and adapted to engage said shoulder and a portion of said valve stem below the shoulder thereof, and means for turning said latch on its pivot to disengage it from the shoulder of the valve stem,
30 substantially as described.

5. The combination with a water closet bowl having a rearward extension containing the service pipe; of a tank separately supported
35 directly over said extension and back of the bowl, the bottom of said tank being above the level of the bowl while its walls extend downward below the bottom to said level; couplings below the tank in the space or
40 chamber formed by the bottom of the tank, the walls thereof, and the said rearward ex-

tension; said couplings connecting the tank with the service pipe; and an operating lever also within said chamber and pivotally supported in the wall of the tank below the bottom thereof, substantially as described. 45

6. The combination with a water closet bowl having a rearward extension containing the service pipe, of a tank separately supported directly over said extension and back of the bowl, the bottom of said tank being above the
50 level of the bowl while its walls extend downward below the bottom to said level, an operating lever below the bottom of said tank and extending outward through the front wall thereof in which it is pivotally supported, and
55 a water-closet seat hinged at its rear end to the outer end of said lever, said rear end being normally supported by the lever somewhat above the level of the bowl, as and for the purpose set forth. 60

7. In combination with a flushing device, a bowl having a service pipe connected therewith, two oppositely directed nozzles for said service pipe respectively opening substantially parallel to the opposite inner walls of
65 the bowl, and adjacent thereto, and a deflector consisting of a rib projecting inward from the front inner surface of the bowl and extending from the top of the said bowl substantially to the surface of the water therein when
70 at its normal level, substantially as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM SCOTT.

Witnesses:

M. E. HILL,

H. J. LIVERMORE.