J. ALLINGHAM.

VALVE MECHANISM FOR LAVATORY APPARATUS.

APPLICATION FILED AUG. 8, 1908.

955,740.

Patented Apr. 19, 1910.

3 SHEETS—SHEET 1.

Fig. 1.

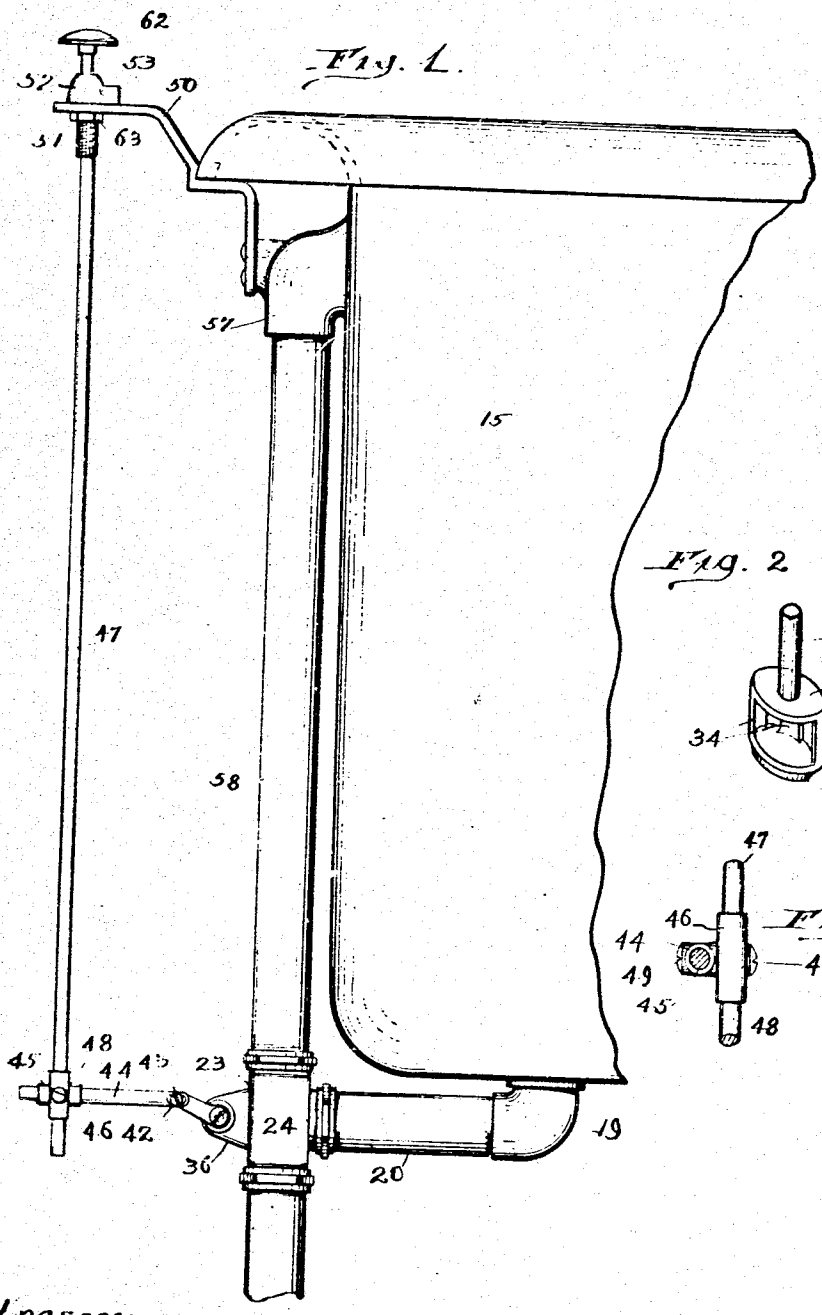


Fig. 2.

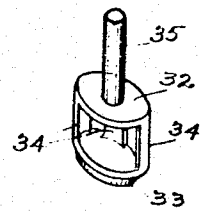
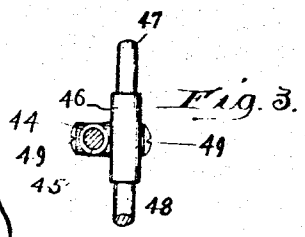


Fig. 3.



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3 SHEETS—SHEET 2.

Fig. 4.

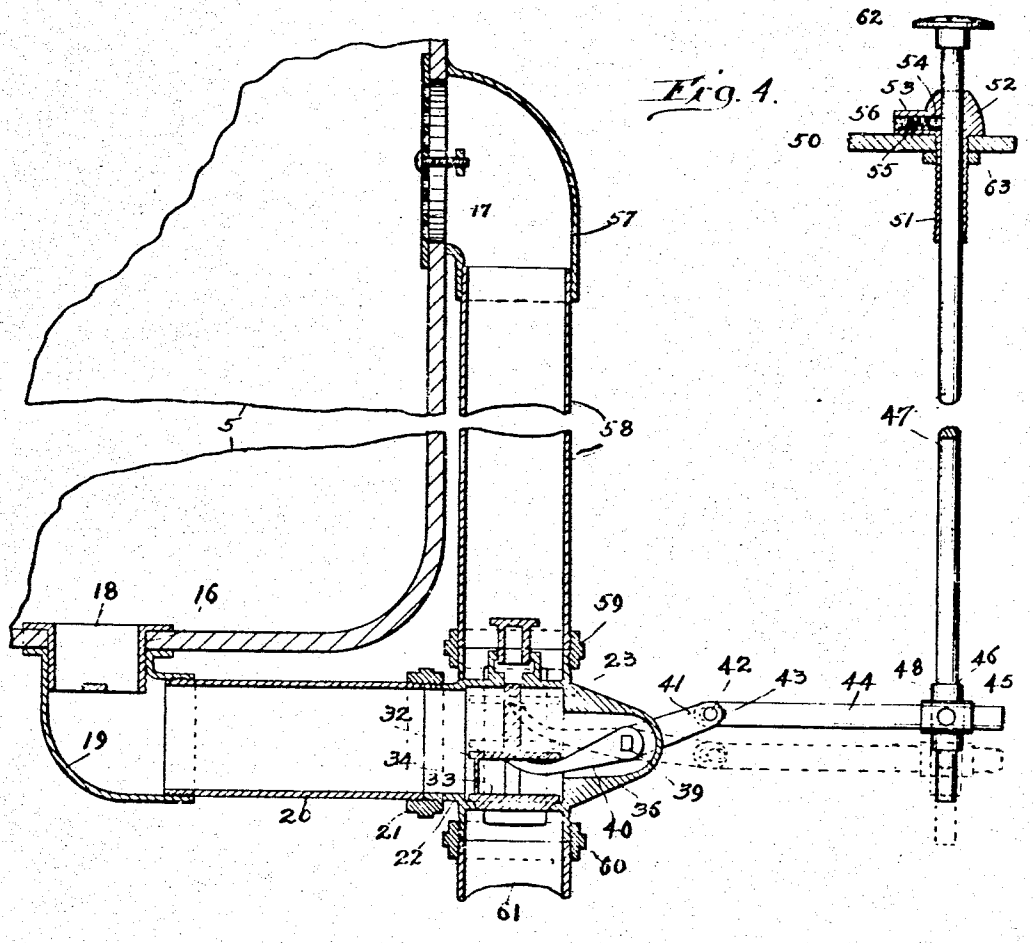


Fig. 5.

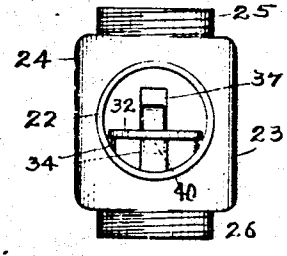


Fig. 6.

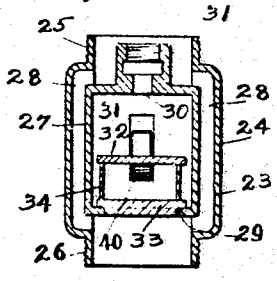
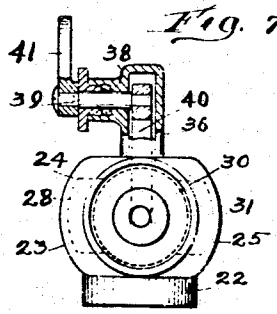


Fig. 7



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VALVE MECHANISM FOR LAVATORY APPARATUS.

APPLICATION FILED AUG. 8, 1908.

955,740. Patented Apr. 19, 1910.

3 SHEETS—SHEET 3.

Fig. 11.

Fig. 8

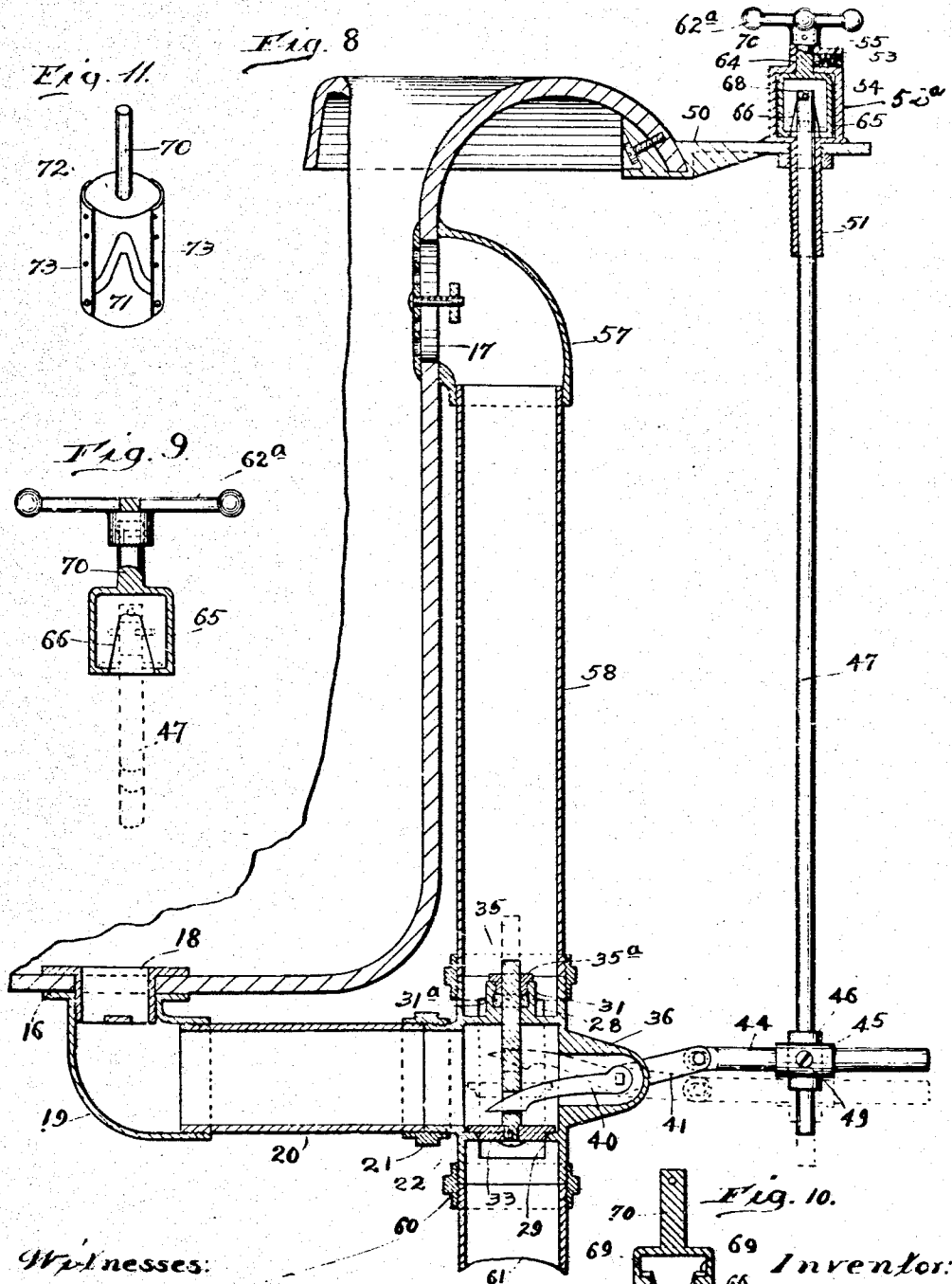
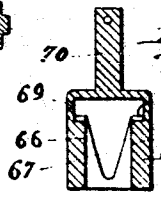


Fig. 9

Fig. 10.



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VALVE MECHANISM FOR LAVATORY APPARATUS.

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Application filed August 8, 1908. Serial No. 447,532.

To all whom it may concern:

Be it known that I, JAMES ALLINGHAM, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Valve Mechanism for Lavatory Apparatus, of which the following is a specification.

This invention relates to improvements in means for operating valves, and has especial relation to valve mechanism for that type of bath-tubs, wash-basins and analogous vessels wherein the valve or stopper controlling the waste or outlet opening is operated externally of and usually from beneath the vessel by means of connections with a knob mounted on or near the rim of the tub or basin, or frame surrounding the same.

The objects of the invention are to provide a lavatory valve mechanism of such construction as to leave the interior of the vessel unobstructed, to be sanitary and cleanly, simple, durable, efficient in operation, and which will not readily get out of working order, and the parts of which can be easily put in place and taken apart.

Another object of the invention is to provide a valve mechanism of such construction that the valve and its operative connections may maintain themselves in any position to which they may be placed, thus avoiding the necessity of holding onto the knob to hold the valve open while discharging the contents of the vessel.

Numerous other objects and advantages of the invention will be disclosed in the subjoined description and explanation.

In order to enable others skilled in the art to which my invention pertains, to make and use the same, I will now proceed to describe it, referring to the accompanying drawings, in which—

Figure 1 is a view in side elevation of a valve mechanism embodying one form of the invention, showing it applied to a portion of a bath-tub; Fig. 2 is a detached perspective view of the valve; Fig. 3 is a view partly in section and partly in elevation of a portion of the operating-rod, showing means for adjustably connecting it to the valve operating crank; Fig. 4 is a vertical sectional view of the valve mechanism shown in Fig. 1 and a part of a bath-tub, illustrating the same shortened for the convenience of illustration, and by dotted lines the position to which the valve and operating parts therefor may be moved; Fig. 5 is a view in elevation of the T-joint or valve casing which has communication with the waste and overflow outlets of the bath-tub and with the main discharge pipe; Fig. 6 is a vertical sectional view thereof; Fig. 7 is a plan view of the same, showing the trigger, crank-shaft and crank for operating the valve; Fig. 8 is a vertical sectional view of a portion of the bath-tub, showing a modification in the construction of the valve operating mechanism; Fig. 9 is a view partly in section and partly in elevation of the cam handle used in the construction illustrated in Fig. 8; Fig. 10 is a vertical sectional view of the same taken at right angles to the view shown in Fig. 9; and Fig. 11 is a detached perspective view of a modification in the construction of the cam handle.

Like numerals of reference refer to corresponding parts throughout the different views of the drawings.

The reference numeral 15 designates a portion of a vessel, which in the present instance is shown as a part of a bath-tub, but which may be a wash-basin or similar vessel having in its bottom a waste opening 16 and in one of its walls near the top thereof an overflow opening 17, in the former of which may be fitted an externally screw-threaded tube 18 to engage the internal screw-threads at one end of an elbow 19, the other end of which is also preferably provided with internal screw-threads to engage one end of a pipe section 20, the other end of which pipe section is connected by means of a screw-threaded collar 21 to an extension 22 on a T-joint or valve casing, which casing is designated as a whole by the reference numeral 23, and consists of a hollow cylindrical casing 24 having screw-threaded extensions 25 and 26 at its upper and lower ends, respectively, as well as the horizontally disposed extension 22, which is connected to the pipe section 20 as before stated. Within the casing 24 is located another casing 27 between the walls of which, and preferably diametrically opposite each other, are formed by-passes 28 which communicate at their upper and lower ends with the hollow extensions 25 and 26, respectively, while the other portions of the inner casing 27 is in contact with or may form a part of the outer casing. The bottom of the inner casing 27 is provided with an opening or valve seat 29, and the top or

transverse partition of said casing is provided with a central aperture 30 and around the same with an upwardly extending hollow extension 31 for the valve-stem, which aperture and extension will furnish a stuffing-box for the latter, as will be presently explained. Loosely located within the inner casing 27 is a valve which preferably consists of two spaced apart disks 32 and 33, which are secured together by means of upright portions 34, as is clearly shown in Figs. 1, 4 and 6 of the drawings. The upper disk 32 of this valve is preferably provided with a vertical stem 35 to pass through the opening 30 and stuffing-box 31 thereabout, as is clearly shown in Fig. 4, to the end that the valve will be held so as to have a vertical movement, yet against lateral or wabbling movement. The lower disk 33 of the valve is preferably downwardly beveled to fit in the correspondingly beveled opening 29 of the inner casing 27, so as to produce a close joint and prevent leakage when the valve is seated.

As shown in Figs. 1, 4 and 7 of the drawings the T-joint 23 is provided between its upper and lower ends with a hollow extension 36, the cavity of which communicates through an opening 37 (see Figs. 5 and 6) with the interior of the inner casing, and has on one of its sides a horizontally extending apertured boss 38 or extension. Journaled in the extension or boss 38 is a shaft 39 which has fixed on its inner portion a trigger or lever 40 which projects into the inner casing 27 and between the disks 32 and 33 of the valve, so as to engage the former disk and to raise the valve from its seat when desired. Rigidly secured on the outer end of the shaft 39 is a crank 41 which has at its other end a screw 42 or other suitable device, which is extended through a slot 43 near one end of a rod 44 and loosely connects said rod to the crank. The outer portion of the rod 44 is extended through a horizontally disposed sleeve 45, which is connected to a vertically disposed sleeve 46 adjustably mounted on the operating-rod 47, which sleeves constitute an adjustable coupling designated as a whole by the reference numeral 48 for said rods. Each of the sleeves 45 and 46 is provided with a set-screw 49 to hold their respective rods in the desired position therein. As shown, the operating-rod 47 is extended vertically through a suitable support 50 which support, in Figs. 1 and 8, is shown as being a bracket connected to the upper portion of the bath-tub or vessel, and in Fig. 4 as a separate support therefrom, but it will be understood that said support may be a part of the bath-tub or vessel, or the slab or frame of a wash-basin or any suitable support. Fitted around the upper portion of the operating-rod 47 is a screw-threaded sleeve 51 which is extended through an opening in the support 50 and has on its upper portion an apertured head 52 provided with a hollow and internally screw-threaded extension 53 which communicates with the opening of the head 52, as will be clearly understood by reference to Figs. 1 and 4 of the drawings. Located in the hollow extension 53 is a plunger 54 which has at its outer end a spring 55 to press it against the rod 57 which, it will be understood, is loosely extended through the sleeve 51 and head 52 thereon. Located in the outer portion of the extension 53 and against the outer portion of the spring 55 is an adjusting screw 56, which screw, spring and plunger constitute a frictional brake for the operating-rod 47 so as to hold it, if desired, in any position to which it may be placed. Connected to the outer surface of the upper portion of the bath-tub 15 or vessel and surrounding the overflow opening 17 therein is an elbow 57, which has screwed to its lower end the upper end of a pipe section 58, the lower end of which is connected by means of a collar 59 or otherwise to the upper extension 25 of the T-joint. Connected by means of a collar 60, or otherwise, to the lower extension 26 of the T-joint 23 is a pipe section 61 which may lead to a proper point for discharge.

Referring now to Figs. 1 and 4 of the drawings it will be seen that the upper end of the operating-rod 47 is provided with a knob-like handle 62 by means of which the operating-rod 47 may be raised and lowered so as to actuate the valve within the T-joint or valve casing. Fitted around the valve-stem 35 and engaging the extension or stuffing-box 31 is a gland 35^a which will retain the packing 31^a in the stuffing-box as is apparent. To firmly secure the head 52 and sleeve 51 in place on the support 50 a nut 63 may be screwed on the sleeve 51 on the opposite side of the support 50 from that on which the head 52 is located.

In Fig. 8 of the drawings I have shown a modification in the construction of the means for moving the operating-rod, and through its instrumentality of actuating the valve in the T-joint, which consists in providing the upper portion of the sleeve 51 with an enlarged hollow head or casing 52^a instead of the head 52 as in the other construction just above described. In this modified construction the hollow head or casing 52^a is preferably cylindrical in shape, and has in its upper portion a vertical opening 64 with which a hollow internal screw-threaded extension 53, as in the other construction, communicates. Located in the extension 53 of this modification is a plunger 54, a spring 55 and a regulating screw 56, as before described. Rotatably mounted in the head 52^a is a handle for raising and lower-

ing the operating-rod 47, and which consists of a cylinder 65 having on its inner surface diametrically disposed cams 66 and 67 (see Figs. 9 and 10) to coöperate with a pin 68 transversely secured in the upper end of the operating-rod 47, which pin projects on one or both sides of said rod sufficiently to engage the surfaces of the cams 66 and 67, so that when the cylinder 65 is rotated the pin 68 will be caused to travel upwardly on the surfaces of the cams 66 until it reaches the top thereof where it may rest and be retained by means of suitable recesses 69 until, by a further rotation of the cylinder 65 it will be displaced therefrom and will descend on the surfaces of the cam 67 until the bottom thereof is reached, when by a further rotation of the cylinder the same operation will be performed.

As shown in Figs. 8, 9 and 10 the cylinder 65 is provided with a stem 70 on its upper portion which is extended through the opening 64 in the head 52^a, and may have thereon a handle 62^a for turning the cylinder.

In Fig. 11 of the drawings I have shown a modification in the construction of the cam cylinder, which consists in forming it of two hollow pieces 71 and 72 which are united together at opposite points by means of vertical straps 73 secured thereto. In this construction the upper member 72 of the cylinder has a stem 70 to which a handle may be secured, as in the other construction.

From the foregoing and by reference to the drawings it will be seen and clearly understood that while I have shown the T-joint formed with a boss or enlargement on each side thereof, each of which has a by-pass therein, and with the stuffing-box for the valve-stem, yet I do not desire to limit myself thereto as the details of construction may be varied and some of the parts omitted without departing from the spirit of the invention. It is also obvious that instead of making the valve of two spaced apart disks as shown and described it may be otherwise formed, yet in such a manner that the trigger or lever 40 may engage the same.

The operation of the device is simple and as follows: When the constructions shown in Figs. 1 to 7, inclusive, of the drawings is employed, the tension of the spring 55 which presses the brake or plunger 54 against the operating-rod 47 may be regulated by means of the screw 56 located in the extension 53 so that the pressure of the brake 54 will hold the rod 47 in any position to which it may be placed, if desired, or the tension may be decreased to such an extent as to permit the rod 47 to be moved without impediment or obstruction. By pressing downwardly on the knob 62 it is evident that, by reason of the loose jointed connections 41 and 44 with the lever or trigger 40 so that the parts will assume the positions shown by dotted lines in Fig. 4, the valve within the T-joint which forms the casing for said valve will be moved from its seat, thus permitting the water from the vessel 15 to be discharged through the members 18, 19, 20, 22 and 61 to the sewer or other point of discharge. In this operation it is obvious that by reason of the loose jointed connections above referred to the operating-rod will have a rectilinear movement only, and that when the valve is raised it will be held in such position, by reason of the action of the brake 54 which will also hold the operating-rod and valve at any intermediate points between the uppermost and lowermost positions thereof. As the top of the inner casing 27 of the T-joint or valve-casing is closed, it is manifest that there will be no communication between the pipe sections 26 and 58, but the by-passes 28 will afford means for the outlet of water from the overflow opening 17 when the valve is closed or seated.

When the construction shown in Figs. 8 to 11, inclusive, is employed virtually the same operation as above-described is performed, except that the rod 47 is raised and lowered by a rotary movement of the handle 62^a, in which operation the cams 66 and 67 co-acting with the transverse pin 68 on the upper portion of the operating lever will cause it to move vertically in a rectilinear line as in the other construction. The movement of the cam-handle or cylinder 65 may be regulated by means of the brake 54, which in this modified construction is pressed against the stem 70 by means of the spring 55, the tension of which is governed by the screw 56 as before stated.

By using the cam-handle constructed as shown in Figs. 8 to 11, inclusive, it is apparent that the operating-rod will be reciprocated or raised and lowered by the rotary movement of the cam-handle, which movement may be in either direction, the cams being so arranged as to afford a continuous contacting surface for the transverse pin so that there will be no fulcrum or stop whereby the parts might be strained when turned by the uninitiated.

From the above description it is obvious that the device is susceptible of considerable modification, besides those above-referred to, without material departure from the principles and spirit of the invention, and for this reason I do not desire to be understood as limiting myself to the precise form and arrangement of the several parts of the apparatus herein set forth in carrying out my invention in practice.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters-Patent, is—

1. The combination with a vessel having a waste opening in its bottom and an overflow opening in its upper portion, of a T-

joint valve casing having communication with said openings and provided with a by-pass communicating with the overflow opening but closed to the waste opening, a valve located in the casing, and means to operate said valve.

2. The combination with a vessel having a waste opening in its bottom and an overflow opening in its upper portion, of a T-joint valve casing having communication with said openings and a by-pass communicating with the overflow opening but closed to the waste opening and provided with a hollow extension, a valve located in the casing, a shaft journaled across the hollow extension, a trigger mounted on said shaft and adapted to engage the valve, and means to operate said shaft and trigger.

3. The combination with a vessel having a waste opening in its bottom and an overflow opening in its upper portion, of a T-joint valve-casing having communication with said openings and provided with a by-pass communicating with the overflow opening but closed to the waste opening, a stuffing-box in the upper portion of said valve-casing, a valve located within the casing and having a stem extended through said stuffing-box, and means to operate said valve.

4. In a valve mechanism of the class described, the combination with a valve-casing having means of connection with the overflow and waste openings of a vessel and provided with a by-pass communicating with the overflow opening but closed to the waste opening leading from said vessel, of a valve seated in the casing, a shaft journaled on the casing, a trigger mounted on said shaft and extended into the casing and adapted to engage the valve, and means to operate said shaft and trigger.

5. In a valve mechanism of the class described, the combination with a valve-casing having means to connect the same with the overflow and waste openings of a vessel, of a valve seated in the casing, a transverse partition located above the valve, a by-pass communicating with the overflow opening above the said partition and with the waste opening of the valve-casing below the valve, and means to operate the valve.

6. In a valve mechanism of the class described, the combination with a valve-casing having means to connect the same with the overflow and waste openings of a vessel, of a valve seated therein, a transverse partition located above the valve, a stuffing-box in said partition, a stem on the valve extended into the stuffing-box, a by-pass connecting the overflow opening above the transverse partition with the waste opening of the valve-casing below the valve, and means to operate the valve.

7. In a valve mechanism of the class described, the combination with the valve-casing having means of connection with the overflow and waste openings of a vessel and provided with a by-pass communicating with the overflow opening but closed to the waste opening leading from said vessel, of a valve seated in the casing and having a recess or opening, a trigger extended into said recess of the valve, and means to operate said trigger.

8. In a valve mechanism of the class described, the combination with a valve-casing having means of connection with the overflow and waste openings of a vessel and provided with a by-pass communicating with the overflow opening but closed to the waste opening leading from said vessel, of a valve seated in the casing and having engaging means, a trigger engaging said means on the valve, and means to operate said trigger.

9. In a valve mechanism of the class described, the combination with a valve-casing having means to connect the same with the overflow and waste openings of a vessel, of a valve seated in the casing, a transverse partition located above the valve and having an opening therein, a stem on the valve extended through said openings, a by-pass connecting the overflow opening above the transverse partition with the waste opening of the valve-casing below the valve, and means to operate the valve.

10. In a valve mechanism of the class described, the combination with a valve-casing having means to connect the same with the overflow and waste openings of the vessel, of a valve seated in the casing, a transverse partition located above the valve, a by-pass connecting the overflow opening above the transverse partition with the waste opening of the valve-casing below the valve, and means to operate the valve.

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