Nov. 10, 1931. A. W. MOSELEY 1,830,955

FLUSH VALVE DEVICE

Filed May 21, 1925

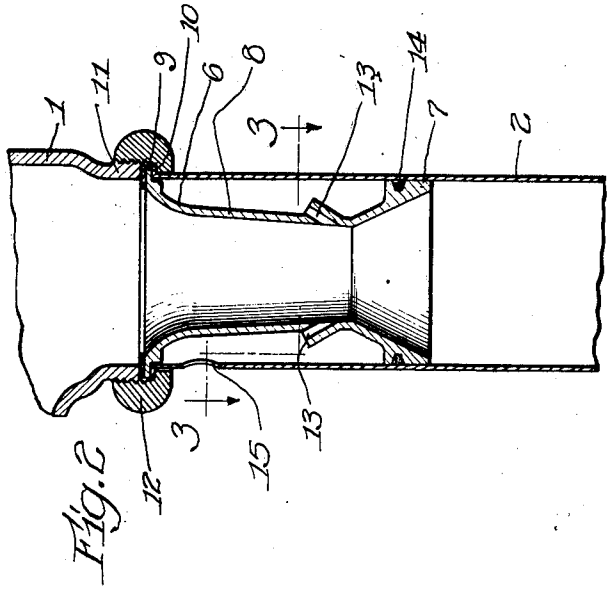


Fig. 2

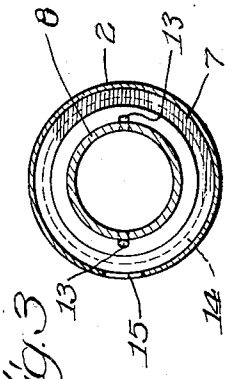


Fig. 3

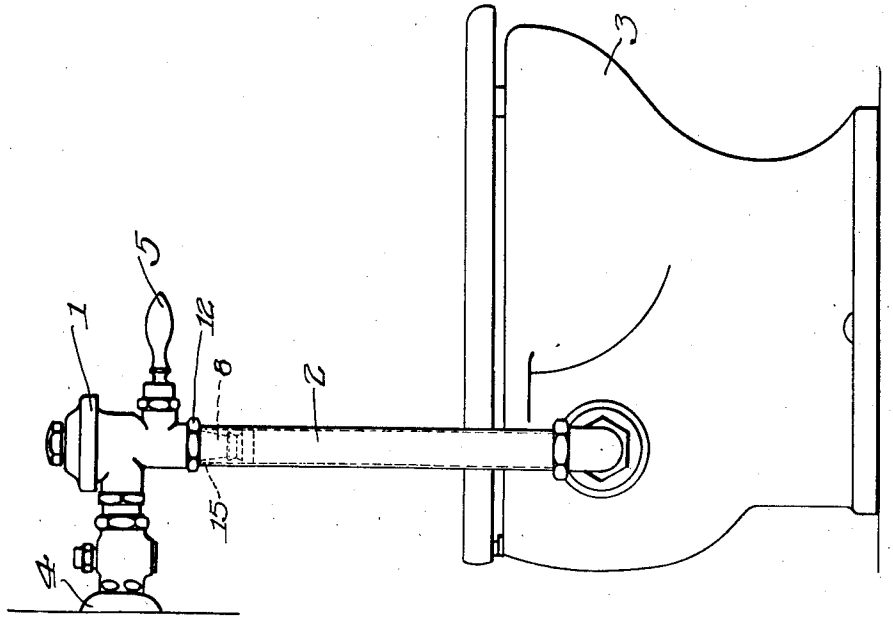


Fig. 1

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UNITED STATES PATENT OFFICE

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FLUSH VALVE DEVICE

Application filed May 21, 1925, Serial No. 31,796, and in Sweden September 10, 1925.

This invention relates to flush valve devices and has for its object to provide a new and improved device of this description.

The invention has as a further object to prevent noise due to the gurgling action of the water being discharged through the discharge pipe.

The invention has as a further object to provide means for preventing contamination by a back flow through the discharge pipe leading from the flush valve.

The invention has as a further object to provide a quick, complete and efficient discharge of the water through the discharge pipe.

The invention has other objects which are more particularly pointed out in the accompanying description.

Referring now to the drawings:

Fig. 1 is a view showing one form of device embodying the invention.

Fig. 2 is a longitudinal sectional view through the stream contracting device.

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

Like numerals refer to like parts throughout the several figures.

Referring now to the drawings, I have shown a flush valve 1 connected by means of a discharge pipe 2 with a bowl 3. The flush valve is connected by the pipe 4 with any suitable source of water supply. When the handle 5 of the flush valve is operated the valve is opened and the water passes through the pipe 4 through the valve and down through the discharge pipe 2 into the bowl. Associated with the flush valve and preferably arranged in the discharge pipe 2 is a device arranged so as to decrease the cross sectional area of the stream of water flowing from the flush valve and to provide means for admitting air at some point where the area of the stream is contracted. In the particular construction shown the controlling device is located in the discharge pipe 2 and consists of an enlarged upper portion 6 and an enlarged lower portion 7 and a contracted intermediate portion 8. The device is provided with some means for supporting it, and in the construction shown the enlarged portion 6 is provided with the flange 9 which is clamped between the flange 10 on the discharge pipe 2 and the lower end 11 of the flush valve casing, the parts being held in position by the union nut 12. Means is provided for admitting air at some point along the intermediate contracted portion 8 of the device. In the construction shown there is provided one or more openings 13. These openings preferably extend downwardly. The enlarged portion 7 is preferably provided with a groove 14 for a suitable packing to insure a snug fit with the discharge pipe 2. When the pipe 2 projects above the opening 13 it is provided with one or more openings 15 located somewhere between the ends of the portions 7 and 9 so that outside air may be admitted through such opening or openings and into the opening or openings 13. In the operation of the device the water flows from the flush valve into the enlarged upper end 9 and then through the contracted intermediate portion 8 and out of the enlarged portion 7. The velocity of the water through the central portion due to the contraction is higher than the velocity of the water in the enlarged upper and lower portions and in the discharge pipe after it leaves the enlarged lower portion. The water flowing through the contracted portion therefore tends to draw air in through the openings 13 and no water escapes through these openings. After the water is shut off by the flush valve and ceases to flow through the contracted portion 8, air passes through the openings 13 into the discharge pipe 2, thereby preventing the water from being partially or wholly trapped in the pipe 2. This also prevents gurgling of the water in the pipe 2 as often happens with the construction heretofore in use. This insures the speedy draining of the water from the discharge pipe 2 into the bowl. This also prevents contamination produced by water being sucked back from the bowl through the flush valve into the supply pipe by siphonage due to the discharge pipe remaining full of water. The device is so constructed and the parts so proportioned that when the water flows therethrough this water will not

flow out through the openings 13. Any desired proportion of the parts may be used. I have found; for example, that with a discharge pipe having an internal diameter of $1\frac{7}{16}$ inches I am able to get proper results by having the contracted portion 8 made with a diameter of $\frac{25}{32}$ of an inch. Other proportions may be used and I have simply specified this particular proportion as being one I have used with discharge pipes having the dimensions given. It will be noted that the device has certain important functions. It prevents water from escaping through the air inlet holes, and it permits air to enter the inlet holes after the water has been discharged through the contracted portion. Any suitable flush valve may be used and I have therefore not shown the construction of this flush valve as the device operates with any of the usual flush valves now in use wherein water is intermittently discharged through a discharge pipe. When the stream contracting device is placed in the upper end of the discharge pipe 2 so that said discharge pipe surrounds it and an opening 15 is provided in the discharge pipe this opening is preferably located so as to be above the opening 13 in the stream contracting device so that if any water should get in between the stream contracting device and the outer pipe it will not escape but will pass through the opening 13, in the intervals between the discharges from the flush valve.

I claim:

1. A device of the kind described comprising a flush pipe, a fixed stream contracting device in said flush pipe having an enlarged upper end and an enlarged lower end and a contracted intermediate portion, and an air admission opening in said contracted intermediate portion, said air admission opening extending downwardly from the exterior toward the interior of the contracted portion, said air admission opening being in communication with the outside atmosphere so that air may enter therein to prevent back siphoning.

2. A device of the kind described comprising a fixed stream contracting device having an enlarged upper end and an enlarged lower end and a contracted intermediate portion, an air admission opening in said contracted intermediate portion, and a discharge pipe into which the water from said stream contracting device is discharged.

3. A device of the kind described comprising an outer pipe, a stream contracting device in said outer pipe and enclosed thereby having a contracted intermediate portion, an air admission opening in said contracted intermediate portion, and an air admission opening in the outer pipe, the air admission opening in the outer pipe being located above the opening in the stream contracting device.

4. A device of the kind described comprising an outer pipe, and a device in said outer pipe and enclosed thereby for preventing the back siphonage of water through said pipe after the forward flow therethrough has ceased, said device having an opening therein intermediate its ends, said outer pipe also having an opening therein.

5. A device of the kind described comprising an outer pipe, a device in said outer pipe separate therefrom for preventing the back siphonage of water through said pipe after the forward flow therethrough has ceased, said device having a water-tight connection at both ends thereof with said outer pipe and means in said outer pipe for admitting air which enters said device so as to prevent back siphoning.

6. A device of the kind described comprising an outer pipe, a stream contracting device in said outer pipe and separate therefrom and having a contracted intermediate portion, said stream contracting device having a water-tight connection at both its ends, with said outer pipe and means in said outer pipe for admitting air which enters said steam contracting device so as to prevent back siphoning.

7. A device of the kind described comprising an outer pipe, a device in said outer pipe for preventing the back siphonage of water through said pipe after the forward flow therethrough has ceased, there being a space between said device and said outer pipe, a communication between the interior of said device and said space and a communication between said space and the outer atmosphere, said latter communication being on a higher level than the first mentioned communication.

Signed at Chicago, county of Cook and State of Illinois, this 13th day of May, 1925.

ALEXANDER W. MOSELEY.