April 22, 1924. 1,491,115

H. TAYLOR

EJECTOR VALVE

Filed May 6, 1922

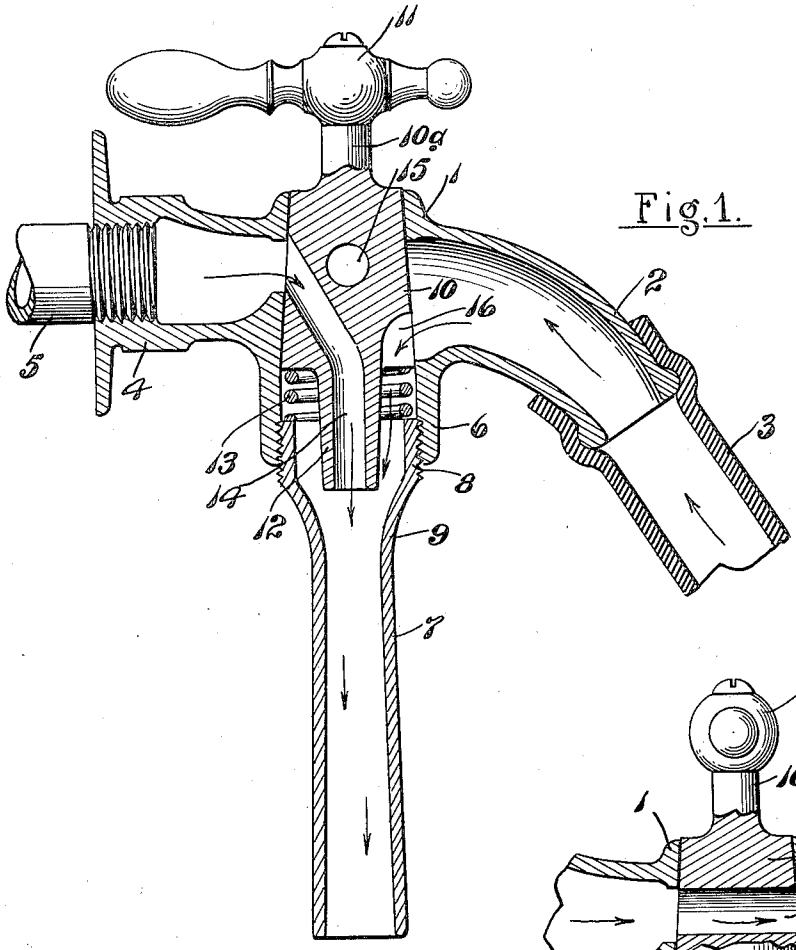


Fig. 1.

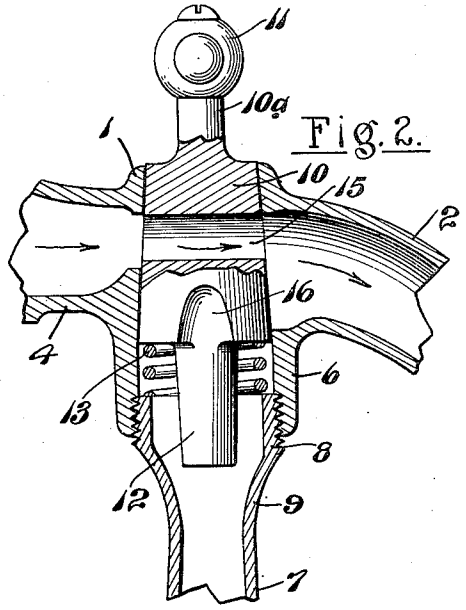


Fig. 2.

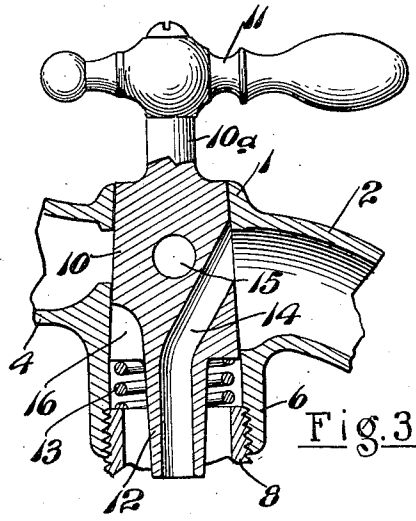


Fig. 3.

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UNITED STATES PATENT OFFICE.

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EJECTOR VALVE.

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To all whom it may concern:

Be it known that I, HUSTON TAYLOR, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Ejector Valves; 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 an ejector valve which is designed particularly for use with washing machines or the like, though not limited in use to the one place stated. With it installed at the end of a water pipe from which the water may flow under pressure, water may be carried through the valve when it is in one position, to the machine. In another position the valve is closed and has no action, and in still another position, the flow of water from the water pipe is utilized to draw the water from the machine through utilization of the well known ejector principle, the flow of water in a properly shaped ejector outlet creating a suction which draws the water from the machine so as to empty it. It is a primary object and purpose of the present invention to make a construction capable of attaining the above described ends, in a simple and economical form at relatively low cost of manufacture, and one which will be durable and efficient in all particulars.

An understanding of the invention by means of which these and other objects and purposes may be had from the following description, taken in connection with the accompanying drawing, in which,

Fig. 1 is a vertical longitudinal section through the apparatus with the valve in the ejector position for removing the water from the machine or other receptacle.

Fig. 2 is a fragmentary like section with the valve in another position for conveying water to the machine or receptacle, and

Fig. 3 is a like fragmentary sectional view showing the valve in closed position.

Like reference characters refer to like parts in the different figures of the drawing.

The valve casing 1 has an outlet nozzle or spout 2 integrally cast therewith to which a length of rubber or other hose may be connected as indicated at 3, the same leading to the washing machine or other receptacle in which water may be contained. At the opposite side of the valve casing 1, a neck 4 is integrally formed which may be screwed on to the threaded end of a pipe 5 connected with the water mains. This valve may be placed over a sink in place of the usual faucet, serving all the purposes of a faucet in addition to its other functions.

The valve casing at its under side is extended downwardly to make a sleeve 6 interiorly threaded and in which an ejector outlet pipe is secured. This pipe 7 has an enlarged threaded upper end 8 which enters the lower end of sleeve 6, the pipe below said upper end decreasing in size uniformly to its narrowest portion 9 and then flaring slightly outward below.

A valve 10 is vertically mounted for rotation in the casing, being formed with a reduced stem 10^a at its upper end to which an operating handle 11 is secured for manual operation of the valve to its different positions. The valve is tapered upwardly toward its upper end and the casing is shaped to correspond. At its lower end the valve is provided with a centrally disposed and downwardly extending member 12 of reduced size which extends into the enlarged upper end 8 of the outlet pipe 7. A coiled spring 13 bears against the upper end of the part 8 and against the under side of the valve 10, being disposed around said member 12. The spring normally tends to force the valve upwardly and maintain the same snugly in its seat or against the sides of the valve casing, as is obvious.

A passage 14 is made upwardly through the part 12 from its lower end, being bent laterally after passing through part 12 to a side of the valve, as shown in Figs. 1 and 3. A second passage 15 is made horizontally through the valve and a recess 16 is formed in one side vertically adjacent the lower end of the valve 10.

In the operation of the construction described, when the valve is in the position shown in Fig. 3, it completely blocks any passage of water from the pipe 5. The passage 15 is out of alinement with the neck 4 and outlet nozzle 2, the recess 16 is located below the passage in the neck 4, and the upper end of the passage 14 is opposite the passage in neck 4. By turning the valve through a quarter turn, the horizontal passage 15 makes a direct connection between the neck 4 and the outlet nozzle 2, as shown in Fig. 2, whereupon the water may flow

freely through the valve and through the hose connection 3 to the washing machine or other receptacle. By still making a further quarter turn of the valve to the position shown in Fig. 1, the passage 14 is brought into position to carry water from the pipe 5 to the outlet pipe 7 of the ejector and at the same time the recess 16 makes a communicating passage from the nozzle 2 with said pipe 7. The effect of the passage of water under pressure through the passage 14 under this condition is to make a vacuum above the lower end of the member 12 whereupon water is drawn through the hose 3, nozzle 2 and recess 16 to the ejector pipe 7, it being obvious that this will continue so long as the water is allowed to run through passage 14 and there is water to be supplied to the hose 3. The machine may be emptied of water at any time, it may be filled at any time, and between times of filling and emptying the valve may be closed.

It will be noted that the taper of the valve 10 is in a direction such that the force of pressure from the liquid in the neck 4 exerts a downward component tending to compress the spring 13. By giving this valve sufficient taper, if the construction is connected with a hot water line, it will act as a relief to the pressure on its attainment of a certain amount sufficient to move the valve downwardly against the upward pressure of the spring. A simple relief and safety valve is thus made which immediately returns to place after the pressure has been reduced.

The construction is simple, easily manufactured and has marked utility. It is very useful as a household fixture, being connected to the water main wherever desired in place of the regular faucet, serving all the purposes of such faucet and having the additional ejector functions outlined. The cost of production is but little more than the usual faucet equipment. The invention is defined in the claims appended hereto and it is to be considered that the invention comprehends all forms of structure coming within the scope of such claims.

I claim:

1. A device of the character described, comprising a valve casing having an outlet nozzle extending therefrom at one side and an inlet neck at the opposite side, said casing at its under side having a downward extension, a valve positioned vertically in the casing and rotatably mounted therein, said valve having a horizontal passage therethrough and a vertical recess in one side at its lower portion located in a side substantially ninety degrees from the sides in which said horizontal passage has its ends, an integral reduced downwardly extending member at the lower end of the valve extending into said downward extension to the valve casing, said member having a vertical passage therethrough extending to the valve and then bent laterally to a side of the valve opposite that in which said recess is made, an outlet pipe connected to said lower extension of the valve casing having a relatively large upper end and a reduced lower portion, and spring means between the upper end of said pipe and the under side of the valve, substantially as described.

2. A device of the character described, comprising a valve casing having an inlet and an outlet, and a second additional outlet, a valve rotatably mounted in the casing, said valve having a passage therethrough connecting the inlet and first outlet when the valve is in one position and a second passage therethrough connecting the inlet and second outlet when in another position, said valve also having a recess in one side connecting the two outlets when in said second position, the valve when in a third position completely closing the inlet against passage of liquid therefrom.

3. In a device of the character described, a valve casing, an upwardly tapered valve rotatably mounted in the casing whereby the force of pressure of liquid is exerted against the tapered sides of the valve, and spring means located under the valve tending to move the same upwardly, substantially as and for the purposes described.

4. A combined faucet and drain valve comprising a casing having inlet and two outlets, a valve having passages therethrough mounted movably in the casing and movable so as to bring the passages at different positions of the valve into conjunction with the inlet to carry liquid to the different outlets at different times, and a recess in a side of the valve connecting the two outlets when the valve is in one of said positions, substantially as described.

5. In combination, a valve casing having an inlet and two outlets, a rotatably mounted valve in the casing having two passages therethrough for carrying liquid, said valve having a reduced extension at one end through which one of the passages is made, said extension passing into one of the outlets, and said valve also having a recess in one side connecting the two outlets in one position of the valve, said valve in one position carrying liquid from the inlet to one of the outlets and in another position from the inlet to the other outlet through said passages, in said other position the passage of the liquid creating a suction in the first outlet through connection by said recess, substantially as described.

In testimony whereof I affix my signature.

HUSTON TAYLOR.