Feb. 16, 1926. 1,573,092

I. H. RUSSELL

VALVE

Filed Nov. 28, 1921

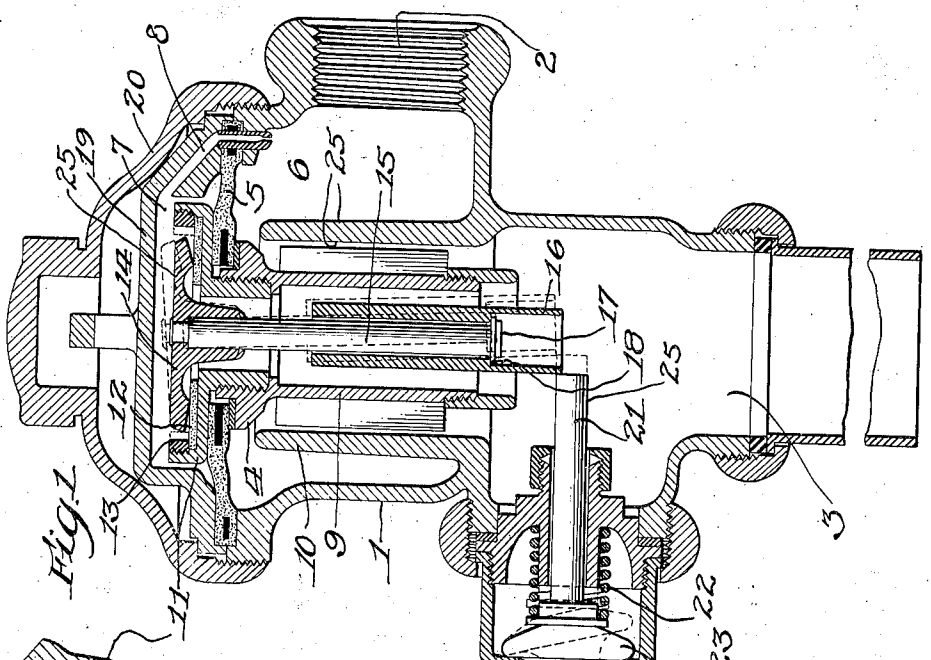

Fig. 1

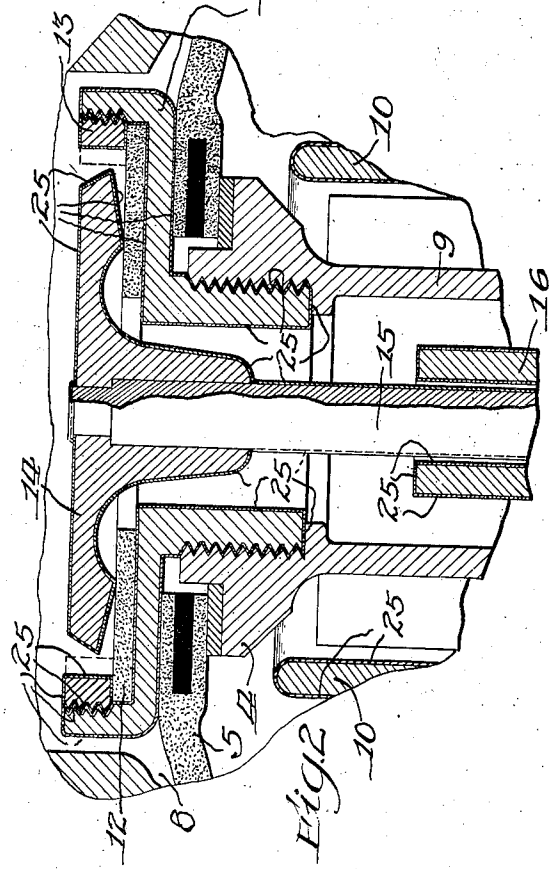

Fig. 2

Inventor:
Irving H. Russell
By Parker Curtis his Attys

Patented Feb. 16, 1926. 1,573,092

UNITED STATES PATENT OFFICE.

IRVING H. RUSSELL, OF CHICAGO, ILLINOIS, ASSIGNOR TO SLOAN VALVE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

VALVE.

Application filed November 28, 1921. Serial No. 518,116.

To all whom it may concern:

Be it known that I, IRVING H. RUSSELL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Valves, of which the following is a specification.

This invention relates to valves, and the process of making the same, and has for its object to provide a new and improved valve and process. It has been found that in the use of valves, such as flush valves, in connection with water systems where the water contains foreign material in solution such as lime or where chemicals are added to the water, such for example as chloride of lime or the like, there is a deposit made upon certain working parts of the valve, which interfere with the proper operation of such valve.

The present invention has among other objects to provide means for remedying this defect, thereby preventing such chemicals from interfering with the operation of the valve. Referring now to the accompanying drawings

Fig. 1 is a sectional view through one form of valve embodying the invention;

Fig. 2 is an enlarged sectional view showing the moving parts of the valve, and illustrating one form of the invention;

Like numerals refer to like parts throughout the several figures.

For purposes of illustration there is shown a flush valve for closets and the like having a main valve and a tilting auxiliary valve. Referring now to the construction illustrated there is an outer casing 1, having an inlet 2, and an outlet 3 for the water. Inside of the casing is a main valve 4, connected with a diaphragm 5, which divides the casing into two chambers 6 and 7, the chambers being connected by a passageway 8. The valve 4 has a cylindrical portion 9 and seats on a cylinder 10 inside of the casing. Removably connected with the main body of the valve 4 is a cup-shaped part 11, having an opening in the center. A packing 12 is located in this cup and is held in place by a metal ring 13. An auxiliary valve 14 seats in this cup, and is provided with a stem 15, which projects into the cylinder 9 of the main valve, and is preferably provided with a sliding sleeve 16, which is prevented from falling off of the stem by the washer 17 which engages the shoulder 18 on the sleeve. There is an interior cap 19 which covers the diaphragm and the auxiliary valve, and there is an exterior cap 20 by means of which access to the interior of the valve is secured.

The valve is operated by means of a longitudinally movable rod 21 which is normally retracted by a spring 22, and which is engaged by the head 23 of a handle 24, the arrangement being such that when the handle 24 is moved in any direction, the rod 21 will be pushed out as shown in dotted lines, and will engage the sleeve 16 and move it so as to tilt the auxiliary valve 14 to open it and permit water to escape from the chamber 7. This reduces the pressure in this chamber and the pressure in chamber 6 beneath the diaphragm 5 moves the diaphragm up, carrying with it the valve 4 and opening the main valve so that the water may pass from chamber 6, through the cylinder 10, and out the outlet 3.

Now it is found that when a valve of this kind is used on a water system where chemicals are applied to the water, such as chloride of lime, there is a deposit of material on the auxiliary valve 14 and the associated parts. This deposit becomes hard and if the valve stands long enough may prevent the auxiliary valve from being tilted. If the auxiliary valve is not prevented from opening, the deposits interferes with its proper action, and also gets between it and its seat so as to prevent the valve from properly closing, and it becomes of vital importance to the proper operation of the valve to prevent the deposit of hardened material on the operating parts.

The auxiliary valve and associated parts are made of metal, and the foreign material in the water often acts chemically upon the metal and causes a new compound to form, which is deposited on the surface on the metal. For example when these parts are made of copper or bronze, and chloride of lime is in the water, a new compound, such as a copper chloride, is formed on the surface of the exposed parts. The present invention provides means for preventing the deposit of a hard coating on the auxiliary valve and associated parts. This result is secured by treating the surface of the auxiliary valve and associated parts so that chemical action is substantially limited, and so that whatever deposit is made on the parts,

is prevented from becoming hard, that is remains in a soft condition so that no evil effect is produced. One process and method of doing this is to provide the auxilary and associated metal parts with a covering, which prevents this deposit of hard material upon it. I have illustrated the valve 14 as provided with such a covering 25. I have also shown the cup 11, the ring 13, the valve stem 15, and the sleeve 16 as all being provided with a coating or covering 25, which prevents the deposit of hard material upon any of these exposed parts. This covering or coating for example may be made of nickel, as I have found that it gives excellent result, and that when there is such a coating of nickel, the hard deposit is prevented, and if there is any deposit at all, it is a soft slimy deposit which easily washes away as the valve is operated, and which does not interfere in any manner with its operation.

This coating prevents a deposit due to a chemical change in the material. I may also place the coating on the part 10 or on the part 21, and any other parts where desirable.

I have described in detail a particular construction embodying the invention, but it is of course evident that the construction and process may be varied in many particulars, without departing from the spirit of the invention as embodied in the claims hereto attached, and I therefore do not limit myself to the particular construction and process herein described.

I claim:

1. A valve device for controlling the flow of liquids comprising a casing, a main valve therein provided with a central opening, a metallic cup connected with said main valve and also having a central opening, a non-metallic piece with a central opening, located in said cup, a metallic holding part in said cup for holding the non-metallic piece in position, an auxiliary valve seated in said cup for controlling said central opening, and a deposit preventing coating on said auxiliary valve, cup and holding part, for preventing the deposit of hard material thereon.

2. A valve device for controlling the flow of liquids comprising a casing, a main valve therein provided with a central opening, a metallic cup connected with said main valve and also having a central opening, a non-metallic piece with a central opening, located in said cup, a metallic holding part in said cup for holding the non-metallic piece in position, an auxiliary valve seated in said cup for controlling said central opening, said valve provided with a stem, a sleeve slidably mounted on said stem, and a deposit preventing coating on said auxiliary valve, stem, sleeve, cup and holding part, for preventing the deposit of hard material thereon, and means for moving said stem and sleeve laterally to tilt the valve.

3. A valve device for controlling the flow of liquids comprising a casing, a main valve therein, an auxiliary valve mounted on said main valve and a deposit preventing coating on said auxiliary valve for preventing the deposit of hard material thereon.

4. A valve device for controlling the flow of liquids comprising a casing, a valve therein normally closed, and a deposit preventing coating on said valve for preventing the deposit of hard material thereon.

5. A valve device for controlling the flow of liquids comprising a casing, a main valve therein provided with a central opening, a cup provided with a central opening and connected with said main valve, an auxiliary valve seated in said cup for controlling said central opening, and means for preventing the deposit of hard material on the outer edge of said valve.

6. A valve device for controlling the flow of liquids comprising a hollow casing and an interior movable valve contained within said casing, a seat for said valve and means for maintaining in a soft condition material that would be deposited upon said valve so that it will be washed away as the valve is used, thereby preventing the deposit of such material from interfering with the proper operation of the valve.

Signed at Chicago, county of Cook and State of Illinois, this 14th day of November, 1921.

IRVING H. RUSSELL.