

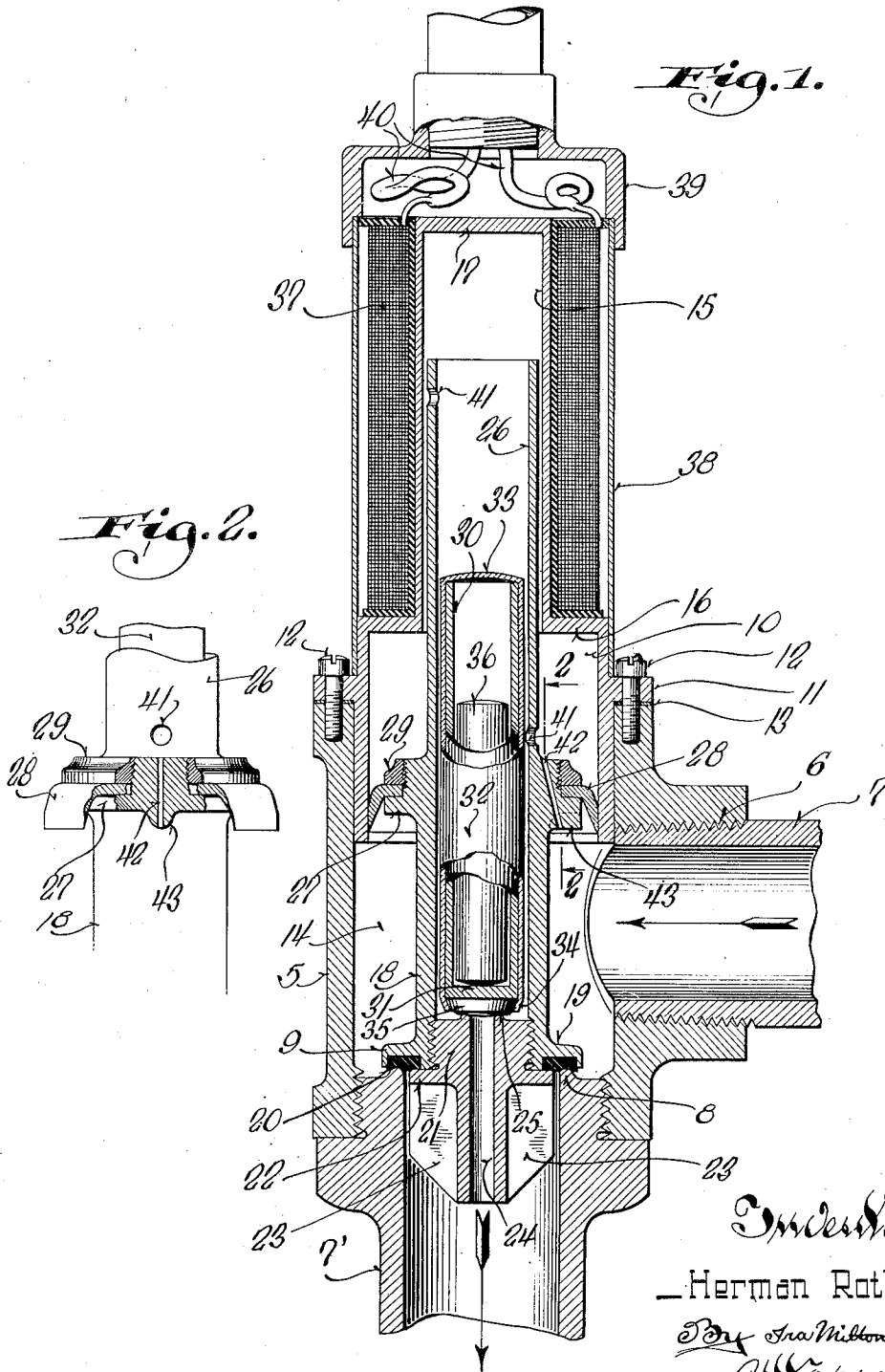
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PLUMBING FIXTURE

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PLUMBING FIXTURE

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This invention relates to certain new and useful improvements in plumbing fixtures of the type illustrated in my co-pending application filed February 27, 1926, Serial No. 91,174, and has as an object to provide a new and improved electrical plumbing fixture which will be compact in construction to permit its ready manufacture at a low cost.

Another object of this invention resides in the provision of an improved plumbing fixture of the character described in which the pressure release valve is carried directly by the armature.

It is another object of this invention to provide an improved plumbing fixture of the character described in which the pressure release valve receives a hammer blow upon the closing of the circuit of the operating coil to insure its operation.

A further object of this invention resides in the provision of an improved plumbing fixture of the character described in which the parts are safeguarded against corrosion due to the action of the water and one in which the operating coil is at all times cooled by a body of water to prevent overheating in the event a fault in the wiring or carelessness keeps the circuit of the coil closed for a long period of time.

And a still further object of this invention resides in the provision of an improved electrically operated flush valve of the character described which is so designed as to permit its being assembled within a conventional T-pipe fitting to thus reduce the overall size of the structure and facilitate its manufacture.

With the above and other objects in view which will appear as the description proceeds, my invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the herein disclosed invention may be made as come within the scope of the claims.

In the accompanying drawing, I have illustrated one complete example of the physical embodiment of my invention constructed according to the best mode I have so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a view of an electrical flush

valve embodying my invention, parts thereof being in section and parts in elevation, and

Figure 2 is an enlarged detail view, partly in section and partly in elevation, taken through Figure 1 on the plane of the line 2—2.

Referring now more particularly to the accompanying drawing, in which like numerals designate like parts throughout the several views, 5 designates a T fitting positioned with its head in vertical alignment and its transverse or lateral opening 6 connected with a water supply pipe 7, the lower end of the vertical head portion thereof being connectible with a flush pipe 7' having a valve seat 8 normally closed by a valve member 9, to be later described.

The upper end of the vertical head portion of the T is closed by a sleeve member 10 having an intermediate lateral flange 11 which is secured to the T by screws or other means 12, there being a gasket 13 interposed between the flange and the coupling to form a fluid tight joint. The sleeve 10 which is open at its lower end to communicate with the interior 14 of the T fitting is constructed of non-corrosive metal such as brass or the like and has a tube 15 extended from its top wall 16 which is integral therewith, the tube being closed at its upper end by a wall 17.

The valve member 9 consists of a tubular member 18 having its lower end 19 laterally flanged and recessed to receive a removable valve disc 20 which is secured in place by an end member 21 threaded in the lower end of the member 18 with a lateral flange 22 extended over the inner periphery of the valve disc, the member 21 having vertical guide fins 23 on its portion disposed within the bore of the flush pipe 7' and having a central bore 24 therein provided with a valve seat 25 at its upper end. The upper end portion 26 of the member 18 is guided within the tube 15 and is enlarged at its medial portion adjacent the sleeve 10, as at 27, to provide a flange against which a leather cup or packing member 28 is secured by a jam nut 29, the leather cup 28 acting as a piston within the sleeve 10, for the purpose later described.

Mounted within the bore of the member 18 is a compound armature consisting of a magnetic tubular armature member 30 closed at its lower end, as at 31, and encased by a tu-

bular member 32 of brass or other non-corrosive metal and having an end wall 33 closing the top of tube 30, the lower end of member 32 being extended beyond the bottom of tube 30 and restricted in diameter, as at 34, to provide a recess for receiving a removable valve disc 35, which normally engages the seat 25 to close the passage 24. Freely slidable within the bore of the member 30 is a second armature 36 which is arranged to be influenced, with the member 30 by a magnetic coil 37 wound about the tube 14 and enclosed within a housing 38, the lower end of which is fitted over the sleeve 10 above the flange 11 and the upper end of which is closed by an outlet box 39 from which the conductors 40 of the coil lead to a source of current, not shown.

The tube 26 of the member 18 is preferably provided with one or more apertures 41, one of which is located adjacent the upper end of a by-pass 42 extending through the enlargement or flange 27 to connect the upper portion of the sleeve 10 with the interior 14 of the T fitting and consequently with the source of water supply from the pipe 7, the lower end of the by-pass 40 passing through a rounded boss or projection 43 formed on the underside of the flange 27 so that the action of the water tends to remove or deflect foreign particles rather than force them into the by-pass to possibly clog the same.

With the parts as illustrated, the source of water is closed from the flush pipe 7' as the pressure of the water against the flange 19 retains the same in closed position and likewise the pressure of the water and the weight of the armature retains the valve 35 closed inasmuch as the pressure on opposite sides of the washer 28 is equalized. However, assuming it is desired to cause the water to flow through the device, the circuit of coil 37 is closed through suitable means such as a push button, not shown, energizing the same. As a result, the compound armature instantly rises to center its mass with respect to the center of magnetic force of the coil, freeing the valve 35 from seat 25 permitting the water within the chamber 10 and tube to discharge through the bore 24 and the by-pass 42 being of relatively small area, the pressure within the chamber raises member 18 inasmuch as the area of the piston 28 is greater than that of the flange 19, disengaging the valve 20 from its seat and permitting the water to flow.

The coil 37 is but momentarily energized and, upon deenergization, the compound armature moves to close the valve 35 from the bore 24 equalizing the pressure on the opposite sides of the member 28. The valve member 20 then moves to engagement with its seat 8 closing the water supply 7 from the flush pipe 7', as will be readily apparent.

The armature 36 being free within the

member 30 moves rapidly upon energization of the coil to strike the top 33 of the tube 32 with a hammer blow to impart an initial opening movement to the valve 35 should it be frozen in place and likewise the member 30, being of a magnetic character, cooperates with the armature 36 to insure the operation of the valve at all times.

From the foregoing description taken in connection with the accompanying drawing it will be readily apparent that I have provided a novel and improved structure of the character described which is of extremely simple design to fit within a conventional T-fitting and which is positive and efficient in operation.

What I claim as my invention is:

1. In a device of the class described, a casing consisting of a T pipe fitting, means connecting the lateral stem of the T with a source of fluid supply, an outlet pipe connected with one end of the head of the T, a valve adjacent the outlet pipe, a tubular extension carried by the valve and extending throughout the length of the head of the T, a piston medially carried by the extension, a solenoid mounted adjacent the other end of the head of the T, an armature mounted within the tubular extension, an auxiliary outlet adjacent the first-mentioned valve, and a valve member carried by the armature and normally engaging the auxiliary outlet whereby energization of the solenoid attracts the armature to open the auxiliary valve and permit the first-mentioned valve to be raised by the fluid pressure from the source of fluid supply.

2. In a device of the class described, a casing having an inlet and outlet, a valve normally closing the inlet from the outlet, a piston connected with the valve and having a by-pass extending therethrough to permit the fluid pressure to equalize itself on both sides of the piston, a relief valve, means for opening the relief valve, and means extended from the under side of the piston adjacent its by-pass to prevent the entrance of foreign matter into the by-pass.

3. In a device of the class described, a casing having an inlet and an outlet, a valve normally closing the inlet from the outlet, an auxiliary relief valve, a solenoid, an armature adapted to be attracted by the solenoid to open the relief valve, and a second armature slidable within the first mentioned armature and totally enclosed thereby to assist in opening the relief valve.

4. In a device of the class described, a casing having an inlet and an outlet, a valve normally closing the inlet from the outlet, an auxiliary relief valve, a solenoid, a tubular armature, means for mounting the relief valve at the lower end of the armature, a second armature, said second armature being of shorter length than the first-mentioned armature and being slidable therein, and a

member enclosing the first-mentioned armature and providing a stop for the second armature whereby energization of the solenoid attracts both armatures, the second giving the first a hammer blow to open the relief valve.

5 5. In a device of the class described, a casing consisting of a T pipe fitting having its head positioned vertically, means connecting the lateral stem of the T with a source of fluid supply, an outlet pipe connected with the lower end of the head of the T, a valve seat adjacent the outlet pipe, a valve normally engaging said seat, a tubular member extending upwardly from the valve, a piston medially carried by said member and having a snug fit with the wall of the casing, said piston being positioned above the inlet opening,

an auxiliary valve passage extending through the valve, an armature positioned within the tubular member extended from the valve, an auxiliary valve formed at the lower end of the armature to normally close the auxiliary valve passage, a second armature positioned within and totally enclosed by the first mentioned armature, a solenoid mounted at the upper end of the head of the T pipe fitting whereby energization of the solenoid attracts the armatures to open the auxiliary valve, and a casing enclosing the solenoid and connected with the upper end of the head of the T.

In testimony whereof I hereunto affix my signature.

HERMAN ROTH.