

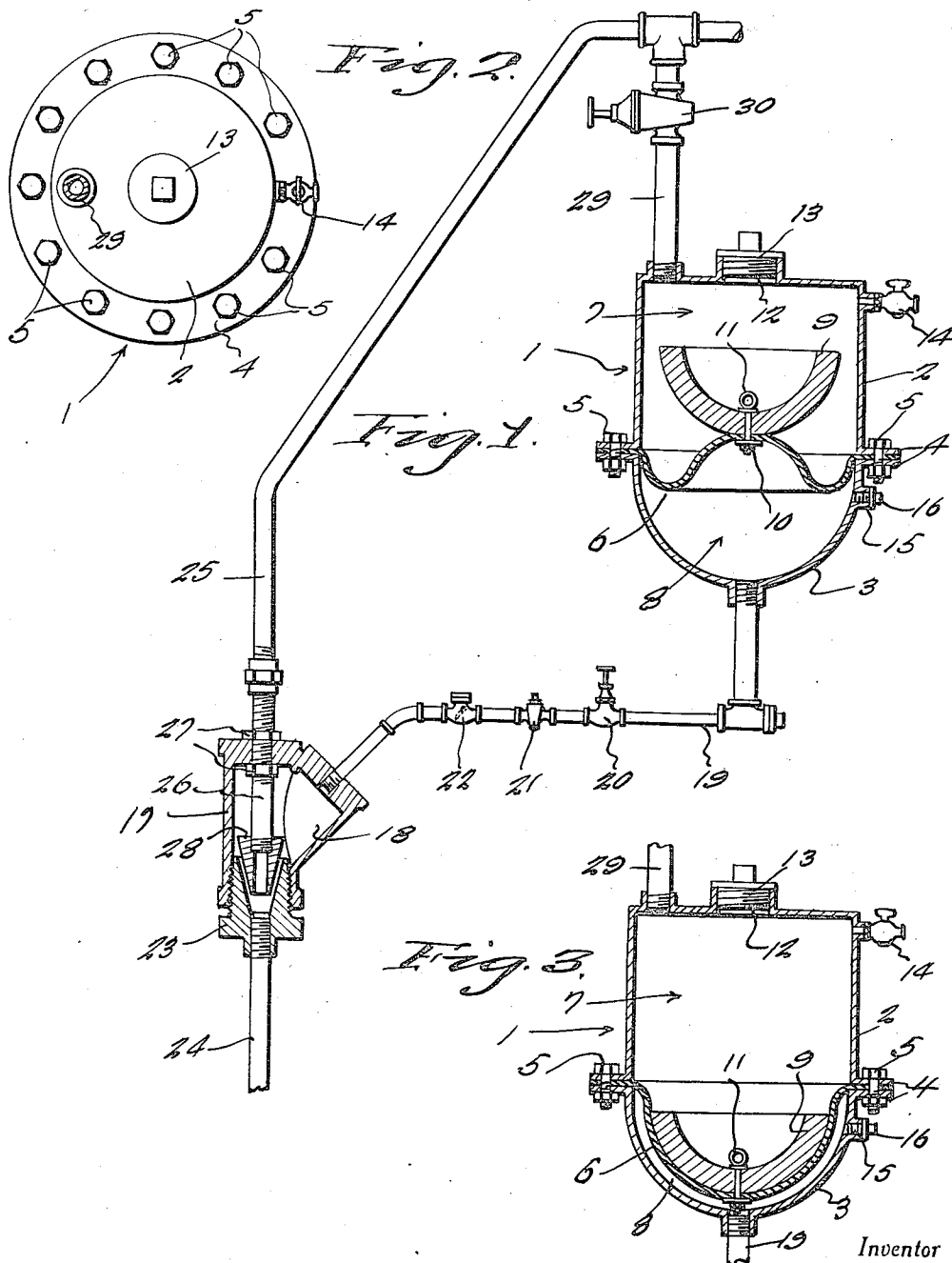
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FLUID FEEDER FOR DOMESTIC WATER LINES

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FLUID FEEDER FOR DOMESTIC
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The present invention relates to a fluid feeder for domestic water lines and has for its primary object to provide, in a manner as hereinafter set forth, a feeder of this character embodying a novel construction, combination and arrangement of parts through the medium of which vegetable or similar compounds may be introduced into the water lines for preventing the formation of scale in hot water piping, coils, tanks, etc., and for preventing the formation of mineral or fungus deposits in cold water lines.

Other objects of the invention are to provide a fluid feeder for domestic water lines which will be simple in construction, strong, durable, highly efficient and reliable in use, compact, and which may be manufactured and installed at low cost.

All of the foregoing and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in connection with the accompanying drawing wherein like characters of reference designate corresponding parts throughout the several views, and wherein:—

Figure 1 is a view in vertical section through a feeder in accordance with the present invention showing the weighted diaphragm thereof in elevated position.

Figure 2 is a view in top plan of the fluid container.

Figure 3 is a view in vertical section through the fluid container, showing the diaphragm in the depressed position which it assumes when the lower part of the container is not filled with a charge of water treating fluid.

Referring in detail to the drawing, the embodiment of the invention shown comprises a closed container which is designated generally by the reference numeral 1, said container comprising upper and lower sections 2 and 3, respectively, which are detachably secured together through the medium of bolts 5 passing through flanges 4. The marginal portion of a flexible rubber diaphragm 6 is clamped between the flanges 4 of the sections 2 and 3 of the container 1, so that said diaphragm divides the container into upper and lower compartments 7 and 8, respectively, the lower compartment receiving the fluid compound which is to be introduced into the water lines.

The reference numeral 9 designates a substantially cup-shaped weight which is secured by a bolt 10, to the upper side of the diaphragm 6. The upper end of the bolt 10 has a lifting ring 11.

The top of the container 1 is provided with a central opening 12 in which a removable closure plug 13 is threaded. The reference numeral 14 designates a valved vent for opening the upper compartment 7 to the atmosphere when desired. The lower compartment 8 is provided with a filling opening 15 which is closed by a removable plug 16.

The injector portion of the device of the invention includes a Y-coupling 17 which comprises an angulated chamber 18 into which leads one end of a pipe 19 whose opposite end is in communication with the bottom of the lower compartment of the container 1. A globe valve 20, a stop cock 21, and a check valve 22 are interpolated between the container 1 and the injector, in the order named.

A tubular body 23 having the inner end of its bore conically flared is threaded into one end portion of the Y-coupling 17 and has threaded into the opposite end of its bore a pipe 24 which leads to and connects with all of the plumbing fixtures or a hot water tank. A water supply pipe 25 leading from the water main (not shown) is coupled to the Y-coupling 17 by means of a longitudinally adjustable tube 26 which is threaded in and traverses the end of the coupling opposite the head 23. Lock nuts 27 are provided for abutting opposite faces of the end of the Y-coupling for locking the tube 26 in adjusted position. Mounted on the inner end of the tube 26 is a conical extension 28 arranged to coact with the conical portion of the bore of the head 23. By adjusting the tube 26 in the Y-coupling 17, the conical plug 28 may be moved into and out of the conical recess in the head 23.

Connected to the top of the container 1 and communicating with the upper compartment 7 is a water supply pipe 29 in which is a control valve 30 which is preferably of the gate type. As may be inferred, the purpose of the pipe 29 is to introduce water under pressure from the supply main into the upper compartment of the container 1 above the diaphragm 6 at the same pressure as that of the water introduced by the pipe 25 into the Y-coupling 17 and reaching as far as the check valve 22.

Briefly, the operation of the invention is as follows:—

With the compartment 8 of the container 1 empty, or substantially so, the diaphragm 6 and the weight 9 will be in the depressed position shown in Figure 3 of the drawing. To fill the compartment 8 with the vegetable or equivalent

water treating compound, the valve 30 is closed, then the vent 14 is opened and the plug 13 removed. Then the filling plug 16 is removed and the globe valve 20 closed. A suitable instrument is then inserted through the opening 12 in the top of the container and engaged with the ring 11 and the weight 9 and the diaphragm 6 pulled up to the elevated position shown in Figure 1 of the drawing. The water treating compound is then poured or otherwise introduced into the compartment 8 below the diaphragm 6 through the filling opening 15. After the compartment 8 has been filled with treating compound the plug 16 is replaced and, the said instrument is removed from the container. Then the vent 14 is closed, the plug 13 replaced, and the valves 20 and 30 reopened.

Although the pressure of the water in the pipes 25 and 29 and in the compartment 7 of the container 1, and in the portion of the pipe 19 between the check valve 22 and the injector is substantially the same, a greater pressure is exerted on the treating fluid in the compartment 8 by the diaphragm 6 by reason of the presence of the weight 9. Thus, the fluid in the compartment 8 being under relatively greater pressure, is forced through the pipe 19 past the valves 20, 21 and 22 and into the lateral portion 18 of the injector, whence it is injected into the pipe 24 where it mixes with the water. Withdrawal of water through the space between the conical extension 28 and the conical recess in the head 23 to the pipe 24, as water is consumed in the pipe system into which the pipe 24 is connected, causes a partial vacuum within the coupling 17 which assists the movement of the treating compound from the pipe 19 into the pipe 24.

The stop cock 21 is provided for controlling the flow of the treating fluid through the pipe line 19. The check valve 22 constitutes auxiliary means for preventing water from entering the compartment 8 of the container 1 from the Y-coupling 17 should the globe valve 20 leak or should the person performing the refilling operation fail to close said globe valve.

It is believed that the many advantages of a fluid feeder in accordance with the present invention will be readily understood, and although the preferred embodiment of the invention is as illustrated and described, it is to be understood that changes in the details of construction and in the combination and arrangement of parts may be resorted to which will fall within the scope of the invention as claimed.

What is claimed is:—

1. In a fluid feeder for a water line having a branch, a closed container, a flexible diaphragm dividing said container into an upper compartment and a lower treating fluid containing compartment, a cup-shaped weight secured to the upper side of said diaphragm at the vertical axis of the closed container, said branch being connected to said upper compartment, and a treating fluid conduit leading from said lower compartment and connecting said lower compartment with said water line beyond said branch.

2. In a fluid feeder for a pipe line having a branch, said feeder comprising an injector interpolated in said pipe line beyond said branch, a closed container, a flexible weighted diaphragm dividing said container into an upper compartment and a lower treating fluid containing com-

partment, said branch being connected with said upper compartment, a treating fluid conduit leading from said lower compartment and connected to said injector, and a check valve in said conduit preventing flow of treating fluid and water in said conduit in a direction toward said lower compartment but permitting flow in the opposite direction, said injector comprising a cylinder having an angulated lateral portion intermediate its ends with which said treating fluid conduit is connected, a longitudinally adjustable tube traversing one end of said cylinder and fed by said pipe line, the opposite end of said cylinder having a discharge opening connected to said pipe line, said opening of the opposite end having a flared inner portion, and a conical head on the inner end of said tube having its sides closely coacting with the sides of said flared inner portion, said conical head having a longitudinal passage therethrough communicating with said tube.

3. In a fluid feeder for a pipe line having a branch, said feeder comprising an injector interpolated in said pipe line beyond said branch, a closed container, a weighted flexible diaphragm dividing said container into an upper compartment and a lower treating fluid containing compartment, said weighted flexible diaphragm creating a differential pressure between said upper and lower compartments, said branch being connected with said upper compartment, a treating fluid conduit leading from said lower compartment and connected to said injector, a check valve in said conduit preventing flow of treating fluid in said conduit in a direction toward said lower compartment but permitting flow in the opposite direction, said weighted diaphragm comprising a flexible sheet attached at its sides to the sides of the container, said sheet having a central part capable of being moved considerable distances to either side of a plane passing through the points of attachment of the sheet to the container, said weighted diaphragm further comprising a cup-shaped weight connected to the upper side of said central part of the flexible sheet near the vertical axis of the container.

4. In a treating fluid feeder for a water pipe line, having a branch, a closed container divided into an upper compartment and a lower compartment by a flexible weighted diaphragm, said weighted diaphragm comprising a weight and a flexible sheet, said flexible sheet being attached at its edges to the sides of the container, said weight being cup-shaped and attached to said flexible sheet near the vertical axis of the container, said flexible weighted diaphragm forming gravity actuated differential pressure means within the container, said upper compartment being connected to said water pipe line through said branch, said upper compartment receiving said water pipe line pressure, said lower compartment being connected by a conduit to said water pipe line beyond said branch, a check valve interpolated in said conduit preventing flow of water from said water pipe line toward said lower compartment, the said lower compartment together with said conduit up to the said check valve to contain treating fluid, said treating fluid being subjected to increased pressure by said differential pressure means, thereby causing the treating fluid to be expelled beyond said check valve into said water pipe line.

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