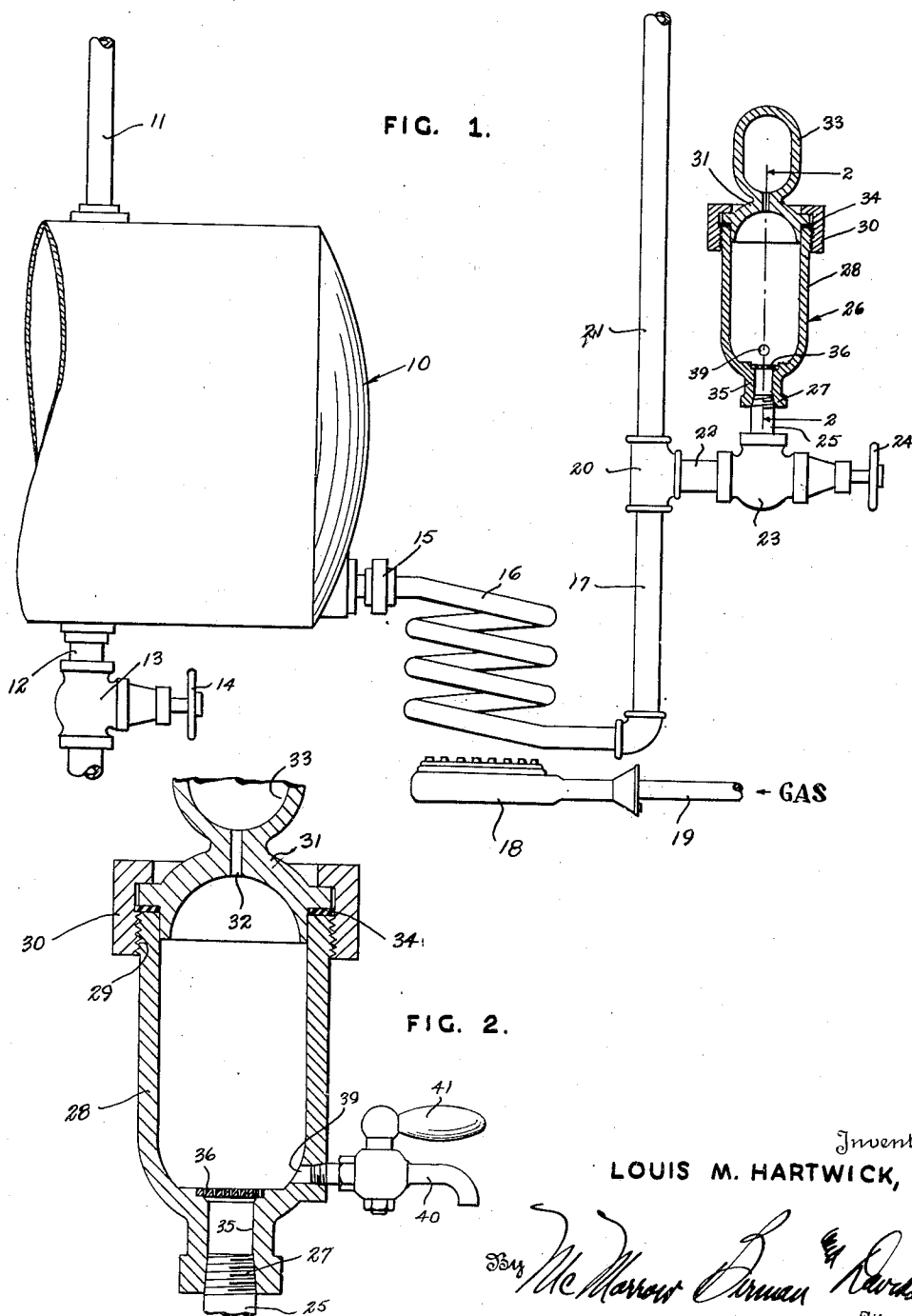


Jan. 10, 1950

L. M. HARTWICK
CHEMICAL INJECTION DEVICE

2,493,870

Filed March 5, 1946



Inventor
LOUIS M. HARTWICK,

By *Mc Morrow Brown & Ruckelshaus*
Attorneys

UNITED STATES PATENT OFFICE

2,493,870

CHEMICAL INJECTION DEVICE

Louis M. Hartwick, Beaver, Pa.; M. Josephine
Hartwick administratrix of said Louis M. Hart-
wick, deceased

Application March 5, 1946, Serial No. 652,175

2 Claims. (Cl. 210—31)

1

This invention relates to a chemical injection device, and more particularly to such a device for the injection of chemicals into a water system for the softening of the water.

A primary object of this invention is the provision of an improved device for the automatic injection of chemicals into a water system, involving the use of hard water, for the purpose of softening the water.

An additional object of the invention is the provision of such a device which will substantially automatically inject chemicals for the above described purpose into the system upon the opening of any tap or faucet in the house.

A further object of the invention is the provision of such a device which will, through the above described injection of chemicals, preclude the clogging and congestion of the pipes of the system due to the action of the chemicals present in so-called hard water.

Still another object of the invention is the provision of such a device which may be readily refilled and re-supplied with chemicals when desired.

A still further object of the invention is the provision of such a device which will be sturdy and durable in construction, reliable and efficient in operation, and relatively simple and inexpensive to manufacture, utilize and assemble.

Other objects reside in the combination of elements, arrangements of parts, and features of construction, all as will be more fully pointed out hereinafter and disclosed in the accompanying drawing wherein there is shown a preferred embodiment of this inventive concept.

In the drawing:

Figure 1 is a schematic view, partially in section, and partially in elevation, disclosing the device of the instant invention as applied to a conventional hot water heating system.

Figure 2 is a sectional view, enlarged, taken substantially along the line 2—2 of Figure 1 as viewed in the direction indicated by the arrows.

Similar reference characters refer to similar parts of the drawing throughout the several views.

Having particular reference now to Figure 1, there is generally indicated at 10 a hot water storage tank, provided with a hot water outlet 11, and a flushing outlet 12 provided with a valve 13, for flushing purposes, operable by a rotatable handle 14.

The tank 10 is supplied with hot water by means of a fitting 15 communicating with a coil 16 through which water is adapted to pass from

2

a cold water inlet 17, the device being heated as by means of a gas burner 18, provided with fuel as through an inlet pipe 19.

While a gas burner is herein described, it will be readily apparent that any other suitable means for heating the water in the coil 16 may be provided as desired.

The inlet pipe 17 is provided with a T 20, in communication with a main inlet 21 and from the base of which extends a pipe 22 communicating with a valve fitting 23, the valve being operable by a handle 24.

From one leg of the fitting 23 a pipe 25 extends into communication with the chemical feeding device, generally indicated at 26, comprising the feature of the instant invention, connection between the two being provided by means of a threaded female aperture 27 in the device 26.

The device 26 includes, as best shown in Figure 2, a chemical chamber 28 having at its upper portion a male threaded portion 29, adapted to be engaged by a threaded cover or lid 30. The lid 30 is adapted to secure in position an arcuate member 31, having a centrally disposed aperture 32 therein, in communication with a sealed air chamber in the upper portion thereof 33. A sealing gasket 34 is provided to preclude the escape of air from the chemical chamber 28.

The device at its base is provided with an outlet 35, and a filter member 36, through which the chemical contained in the chamber 28 is adapted to be poured, in a manner to be described hereinafter. A venting outlet 39 is also provided, to which is secured a faucet 40, including an internally positioned valve for drainage purposes, and provided with an operating handle 41.

From the foregoing the operation of the device should now be readily understandable. Upon removal of the cover member 30, the chemical chamber 28 is adapted to be filled with a suitable chemical, or chemicals, such for example as hydrated lime and caustic soda or soda ash, such chemicals being known as adapted to precipitate from so-called hard water soluble lime and magnesia salts, such salts being objectionable in that they clog the piping of hot water systems through which so-called hard water passes. In the operation of the device the chamber 28 is filled, as previously mentioned by the removal of the cover 30, and the cover 30 is re-positioned thereon. When the system is filled with water, the pressure of the water in the system provides a compression of the air in the chamber 33. When any faucet in the water system is opened for the purpose of drawing off hot water, the pressure in the

system is correspondingly lowered, whereupon the air pressure 33 causes the eviction of the chemicals in the chamber 28 through the outlet 35. The chemicals, which may be either in dry form or in the form of solution, are thus injected into the system and circulate through the water, thus precipitating the undesirable chemicals in hard water.

From the foregoing it will be seen that there is herein provided an improved chemical dispensing device which accomplishes all the objects of this invention, and others, including many advantages of great practical utility and commercial importance.

I claim:

1. Apparatus for injecting chemical material into the feed line of a pressure water system whenever the normal pressure of the system is reduced, said apparatus comprising a chemical containing chamber comprising a vertical cylindrical hollow body, means on the lower end of said body adapted to be connected with the feed line to provide sole communication between the interior of said chamber and the feed line, an air cushion chamber on the upper end of said hollow body, and means providing restricted communication between said air cushion chamber and the interior of said hollow body whereby an air cushion is trapped under pressure in said air cushion chamber while the system is under normal pressure and water from said feed line enters said chemical containing chamber and mixes with the chemical therein, and whereby said air cushion expands upon a reduction in pressure in said system below normal and produces a flow of chemical and water mixture from said chemical containing chamber into said feed line, said hollow body being open at its upper end to receive chemical, and said air cushion chamber comprising a cover removably closing the upper end of said body, a hollow globe rising from said cover, and said restricted communication means comprising a relatively small diameter passage formed in said cover and said globe and connecting the interior of said globe with the interior of said hollow body.

2. Apparatus for injecting chemical material into the feed line of a pressure water system whenever the normal pressure of the system is reduced,

said apparatus comprising a chemical containing chamber comprising a vertical cylindrical hollow body, means on the lower end of said body adapted to be connected with the feed line to provide sole communication between the interior of said chamber and the feed line, an air cushion chamber on the upper end of said hollow body, and means providing restricted communication between said air cushion chamber and the interior of said hollow body whereby an air cushion is trapped under pressure in said air cushion chamber while the system is under normal pressure and water from said feed line enters said chemical containing chamber and mixes with the chemical therein, and whereby said air cushion expands upon a reduction in pressure in said system below normal and produces a flow of chemical and water mixture from said chemical containing chamber into said feed line, said hollow body being open at its upper end to receive chemical, and said air cushion chamber comprising a cover removably closing the upper end of said body, a hollow globe rising from said cover, and said restricted communication means comprising a relatively small diameter passage formed in said cover and said globe and connecting the interior of said globe with the interior of said hollow body, said hollow cylindrical body being vertically elongated and said hollow globe being axially aligned with said body, and said small diameter passage being open axially into said bulb and said body.

LOUIS M. HARTWICK.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,676,134	Coughan	July 3, 1928
1,728,513	Smiley	Sept. 17, 1929
1,855,323	Sirch	Apr. 26, 1932
2,048,606	Feutterer	July 21, 1936
2,064,627	Paine	Dec. 15, 1936
2,128,721	Watts	Aug. 30, 1938
2,224,101	Hegwein	Dec. 3, 1940
2,362,606	Albertson et al.	Nov. 14, 1944