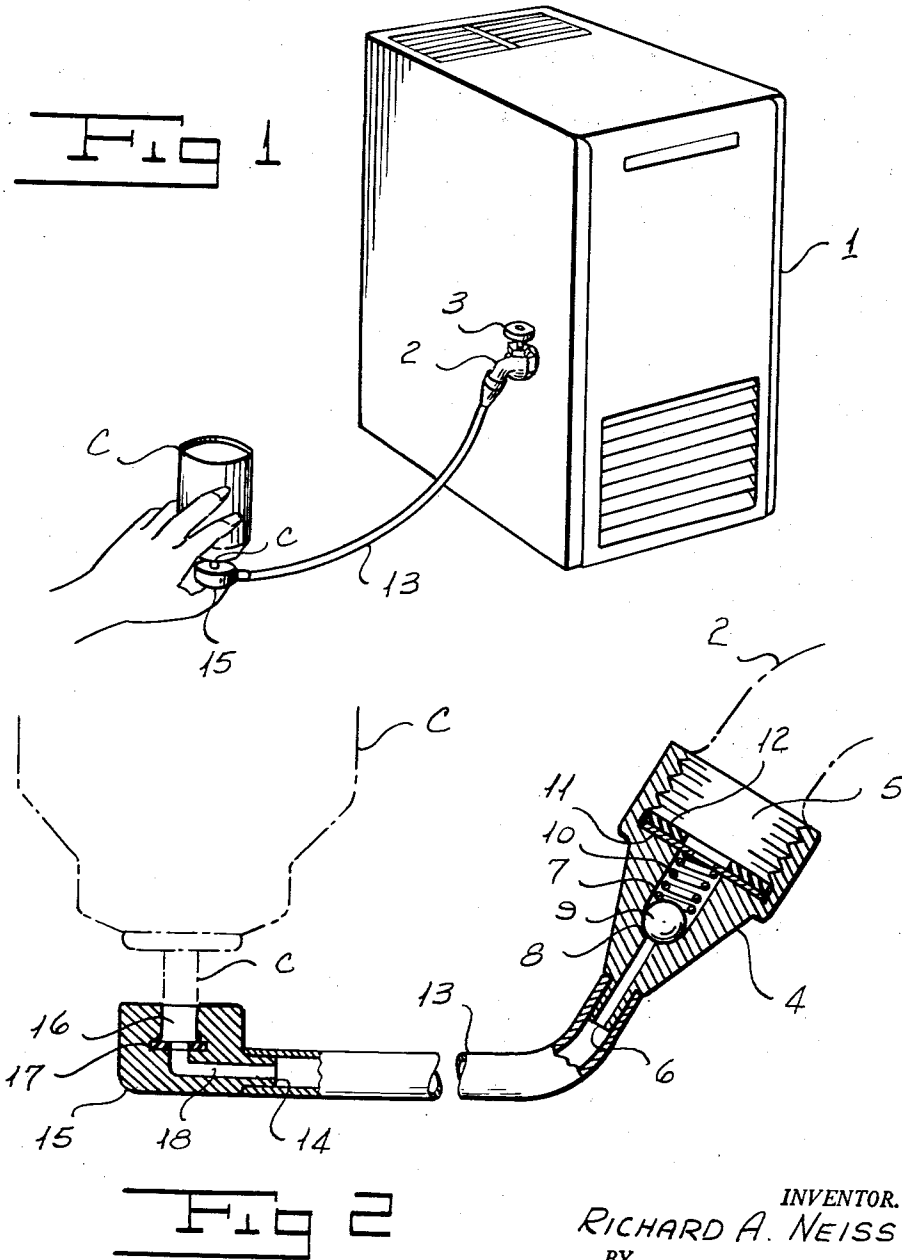


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METHOD FOR PROTECTING AND TREATING A HEATING  
SYSTEM AGAINST RUST, CORROSION, ETC.  
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1

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**METHOD FOR PROTECTING AND TREATING A HEATING SYSTEM AGAINST RUST, CORROSION, ETC.**

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This invention comprises a method of and means for protecting and treating a heating system against rust, corrosion, etc., through the introduction into said system of water softeners or other agents adapted to maintain the system at maximum efficiency.

In boiler systems, more particularly in those employed for domestic heating, the operation of the same over protracted periods results in the accumulation of rust, sludge, and other foreign material which not only cause deterioration of the systems, but also materially decreases their efficiency. This is true not only of steam systems but closed hot water heating systems as well. To maintain such a system in efficient condition, it is necessary to periodically introduce into the system, some protective or ameliorating agent which, generally through chemical action, minimizes, neutralizes, or prevents the formation of rust and other deposits or acts as a water softener to protect the system against the deteriorating action of hard boiler water.

In closed hot water heating systems, it has heretofore been the practice, irrespective of the temperature outside of the building, to shut down the system sufficiently to permit working therewith. The operator, generally a plumber, then drains the system well down into the boiler area. He then introduces the curative agent into the boiler above the water level therein. Then he pours compounds into an open fitting in the system and refills it to capacity, then bleeds the air out of the system, and re-establishes the operation of the system in the usual manner. This operation is permitted to continue for a sufficient period of time, usually a few days, to permit said compounds to function. The plumber then returns, completely empties the system of its contents, generally through the drain cock at the lowest point in the system. In so doing he must open the air valve of every radiator in the system in order to effect a complete drainage. After the system is thoroughly drained, the bleed valves in all of the radiators must then be closed, the system then refilled with water, and the valves in the radiator again opened to permit the discharge of any air which has been trapped in each individual radiator.

The foregoing operations extend over several days, require at least three or four hours of a plumber's time, and the system, at the end of the operation, is left unprotected against further deterioration of the character described so that the same old procedure must be again practiced when the system again ceases to function properly.

The object of the present invention is to provide means whereby systems of the character described may be treated in a simple and efficient manner and in the space of a few minutes, so as to either preclude or minimize the building up of the detrimental conditions referred to or applying a treatment which will in a large measure correct these conditions if they have already developed in the system.

An important feature of this invention is that the treatment of the system may be carried out without interrupting the operations thereof so that it can be performed in the coldest weather as well as in the summer time.

Another feature of the invention is that the cost of this treatment is negligible as compared to prior practice.

Another feature of this invention is that the treatment

2

may be carried out by the occupant of the house, without requiring any tools or the hiring of any professional skill.

Speaking generally, the method of this invention consists in the provision of one or more appropriate containers wherein the treating agent or agents are contained under pressure greater than the pressure in the system. The pressurized containers thus used may be likened unto aerosol dispensers with their usual discharge valves, save that the propellant used must be an inert material, preferably gaseous, such, for example, as nitrogen. No dip tube need be employed, the criteria being that the treating agent be packaged under pressure to be discharged, while in inverted position, through the valve stem when the associated valve is manually opened.

It is impractical to attempt to feed such pressurized material directly into an operating pressurized system. The present invention, therefore, includes in combination with said container an adapter provided with a valve-operating connection adapted to be slipped over the valve stem of the container and with a coupling, which may be a female threaded coupling, preferably adapted to screw onto the valved drain cock of the furnace.

In carrying out the method of this invention, the pressurized container is connected to a furnace cock while the valve of the latter is closed. The valve-operating connection is slipped over the valve stem of the pressurized package. The valve of the cock is then opened and the valve-operating connection is pressed to release the pressurized treating agent, so that the latter flows through the adapter into the furnace. If one container of the treating agent is sufficient, the valve in the cock may be closed as soon as its contents have been introduced into the system. Additional containers may be connected in the manner described if desired with an opening of the valve in the drain cock while the agent in each is dispensed. Alternatively, there may be incorporated in the adapter, a check valve which will preclude retrograde movement of water from the system through the adapter and thus make it unnecessary to close the cock valve until the treatment has been completed.

Features of the invention, other than those adverted to, will be apparent from the hereinafter detailed description and appended claims, when read in conjunction with the accompanying drawings.

The accompanying drawings illustrate one practical embodiment of the invention, but the construction therein shown is to be understood as illustrative, only, and not as defining the limits of the invention.

FIG. 1 is a perspective view of a domestic furnace showing the apparatus of this invention in the act of performing the method thereof.

FIG. 2 shows portions of the parts illustrated in FIG. 1 with the greater portion of the adapter in section.

Referring to the drawings, 1 designates a domestic heating furnace of the character wherein water is heated for heat transference to the radiators of a house heating system. This furnace is provided with a conventional drain cock 2 embodying a shut-off valve 3. C indicates a pressurized container of conventional form containing the agent for treating the heating system and a propellant under sufficient pressure to force the agent out of the container through the tubular valve stem c when the container is inverted and said valve stem pressed in the direction of the bottom of the container.

The treating agent within the container may be a water softener, a rust preventative, or a material to free rust from the pipes and sludge from the pipes and the furnace surfaces with which water comes into contact, or any other appropriate agent with which it is desired to treat the heating system.

The preferred form of adapter, useful in carrying out

3

the method of this invention, comprises a furnace coupling 4 having a threaded female socket 5 at one end and a nipple 6 at its other end. The coupling is provided intermediate its ends with a pocket 7 terminating in a valve seat 8. A check valve 9 is adapted to cooperate with said seat and is normally urged into contact therewith by a helical spring 10 reacting against a perforated plate 11 seated in the base of the socket 5 beneath a washer 12 as shown.

Secured to the nipple 6 of the furnace coupling 4 is one end of a tube 13, the other end of which is connected to a nipple 14 on a container coupling in the form of a valve operating finger piece 15. This finger piece is provided with a socket 16 adapted to be passed over the tubular valve stem *c* of the container and provided at its base with a washer 17. The finger piece has a passage 18 leading from the socket 16 through the nipple 14.

In performing my method as here illustrated, the furnace coupling 4 is first screwed onto the drain cock 2, as shown in FIG. 2, and the valve 3 of said drain cock may then be opened for the check valve 9 will confine the water of the heating system of which the furnace forms a part. A container C, charged as described, is inverted and the valve stem inserted into the socket 16 of the finger piece 15 and held in place therein by the operator's hand as shown in FIG. 1 of the drawing. The finger piece may then be pressed in an upward direction to open the valve of the container, so that the treating agent contained in said container may be forced therefrom through the adapter and through the drain cock 2 into the furnace. If a sufficient amount of the agent is contained in the container to effect the desired treatment, the valve 3 of the drain cock may be shut off after all of said agent has passed into the furnace. If, however, the contents of several containers is required to effect the desired treatment, then these containers may be associated with the finger piece in succession until sufficient agent has been thus introduced into the system. It is common practice for containers of the general character described to carry pressures upwardly of 70 lbs. per square inch and such pressures are in excess of those present in house heating systems and are effective to unseat the check valve 9, so that the agent may be fed to the furnace quickly and without spillage.

When all the agent required has been introduced into the furnace the valve of the drain cock is closed and the furnace coupling 4 removed from said cock, so that the system may continue to function without interruption either during the introduction of the agent or thereafter.

An important feature of this invention is that the agent, when introduced into an operating system, acts upon water which usually has been in the system for some time and has thus become relatively soft through continued use. It is not necessary in carrying out this invention to change the water with fresh water containing impurities, air and other extraneous matter which will tend to rapidly promote rust, scale and other detrimental conditions in the system. In fact, the present invention does not require the changing of the water at any time. Small quantities of boiler feed water, added from time to time to the system in the usual manner, will be neutralized by the agent in the system.

4

It is also possible through the employment of the present invention to introduce a colloid or other anti-leak compositions from a pressurized container into the heating system for the purpose of stopping such small leaks as may occur in these systems. In fact any appropriate agent useful in insuring or prolonging the efficiency of a heating system may be introduced in the manner stated and left in the system for long periods of time.

The use method of this invention is recommended in newly installed heating systems for the agent or agents then introduced will serve to initially condition said system for long periods of operation at maximum efficiency.

The foregoing detailed description sets forth the preferred embodiment of this invention. However, I am aware that the particular form of adapter which I have shown is capable of wide variation in form, utilizing a tube or otherwise, to provide operative connection between the tubular valve stem of the container and a valved cock of the furnace. For this reason it is to be understood that the present invention is fully commensurate with the appended claims.

Having thus fully described the invention, what I claim as new and desire to secure by Letters Patent is:

1. Method of treating a domestic steam and hot water system having a furnace and a normally closed opening means, which comprises: temporarily manually coupling into said system while it remains in normally closed condition a dispenser container which is normally disconnected from the system, said container having a normally closed manually operable valve and containing a liquid treating agent for protecting the system against deterioration, and a non-foaming gaseous propellant under residual pressure greater than the internal pressure of the system and having a connecting means adapted to be connected to the system, said coupling including the steps of connecting said connecting means to said normally closed opening means in the system, then opening communication between the interior of said system and the manually operable valve of the container by opening the normally closed opening means, then manually opening the valve of the container to feed the treating agent from the container into the system, thereafter closing communication between the interior of the system and the container by closing the said opening means, and thereupon disconnecting the container from the system, and foregoing steps being duplicated in their entirety for each treatment of the system.

2. Method according to claim 1, wherein the opening means is the drain cock of the furnace.

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