

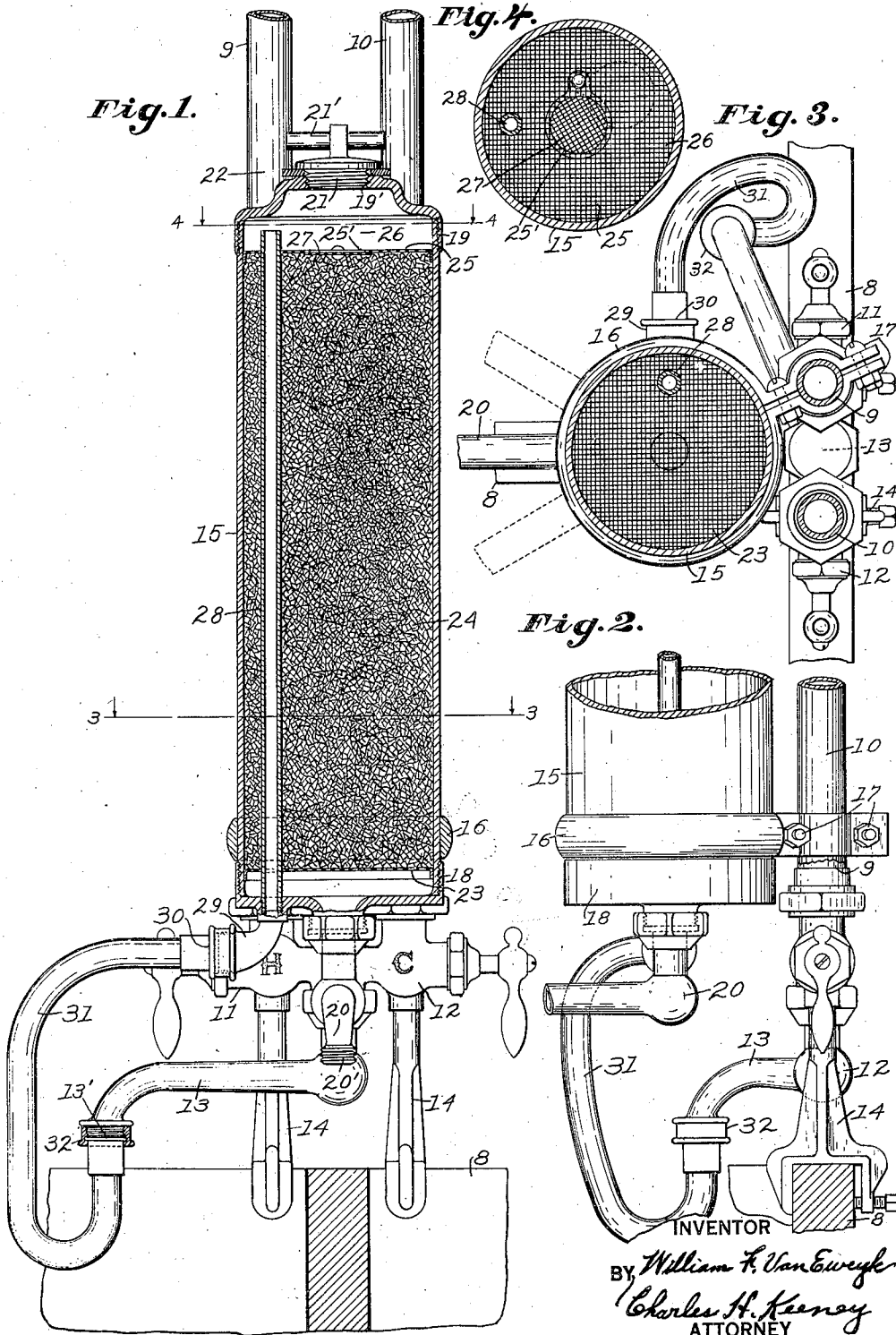
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ATTACHABLE WATER SOFTENER

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ATTACHABLE WATER SOFTENER

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5 Claims. (Cl. 210—24)

This invention relates to improvements in attachable water softeners more particularly adapted for home use in the laundry.

The general object of the invention is to provide an attachable water softener which may be sold over the counter and be easily attached to the supply pipes in the laundry to discharge hot or cold softened water into either compartment of the ordinary two compartment laundry tub without changing in any manner the said supply pipes.

A further object of the invention is to provide an attachable water softener more particularly, but not solely, adapted for using zeolite or other similar base exchange material as the water softening medium.

A further object of the invention is to provide an attachable water softener having means permitting restoration of the base exchange capacity of the water softening medium when it becomes exhausted.

A further object of the invention is to provide an attachable water softener with means for back flushing the water softening medium in the receptacle when desired.

A further object of the invention is to provide an attachable water softener having means permitting the convenient recharging the receptacle with the water softening medium without disconnecting the receptacle from the water supply.

With the above and other objects in view the invention consists of the improved water softener and its parts and combinations as set forth in the claims, and all equivalents thereof.

In the accompanying drawing in which the same reference characters indicate the same parts in all of the views:

Fig. 1 is a vertical central sectional view of the attachable water softener shown mounted on a two compartment laundry tub, some of the parts being shown in full line;

Fig. 2 is a side view of the lower portion of the attachable water softener taken at right angles to Fig. 1;

Fig. 3 is a horizontal sectional view thereof taken on the line 3—3 of Fig. 1; and

Fig. 4 is a horizontal sectional detail view taken on line 4—4 of Fig. 1.

Referring to the drawing the numeral 8 indicates a fragmentary portion of an ordinary two compartment laundry tub, and 9 and 10 portions of spaced pipes forming part of the water system of a laundry of an ordinary home. The water system also includes valves 11 and 12 having a swing spout 13 connected thereto for supplying

hot or cold or tempered water to either tub compartment. One of the valves is marked H to indicate the hot water supply and the other valve is marked C to indicate the cold water supply. The outer end of the swing spout is threaded as indicated by the numeral 13', in the ordinary manner. Brackets 14 are connected to and support the supply pipes on the rear wall of the tub.

The improved attachable water softener is arranged to be positioned in front of the supply pipes above the manually operative valves 12 and comprises a cylindrical receptacle 15 supported on one of the supply pipes by means of a split band or collar 16 having screws and nuts 17 for clamping the receptacle firmly to said supply pipe.

The receptacle 15 is provided with a lower head 18 and an upper head 19 and a horizontally movable discharge swing spout 20 is connected to the lower head 18 to discharge softened water into either compartment of the tub. The discharge outer end portion of the spout 20 is threaded in the ordinary manner as indicated by the numeral 20' for connection with a flexible tube or hose to be later described.

The upper head 19 is formed with a threaded opening 19' closed by a plug 21 having a handle 21' for manual operation. A rubber gasket 22 forms a water tight connection between the plug and the head.

A lower screen partition 23 is positioned within the lower portion of the receptacle a short distance above the lower head to prevent the loss of any of the zeolite or other base exchange medium or material 24 supported on said screen when water is discharged from the spout 20.

An upper screen partition 25 within the upper portion of the receptacle is positioned below the upper head to form a mixing chamber 26 in said head to permit tempering the water to the desired degree before it passes through the receptacle.

The upper screen partition is formed with a central opening 25' to permit recharging the receptacle with zeolite or other like base exchange material in the event that any of the material is lost, and to prevent the loss of material during the back flushing operation, a gate or closure 27 formed of screen material is pivoted to the lower side of the partition to be swung edgewise to open position when it is desired to replace the material lost. The swing gate 27 is positioned on the lower side of the screen partition to prevent the pressure, during the back flushing, springing the gate upwardly to an open position.

An inlet pipe 28 connected to the lower head

18 extends upwardly through both screen partitions and opens into the mixing chamber 26 and at its lower end connects to an elbow 29 below the lower head 18. Said elbow at its outer end has a threaded connection with a coupling 30 forming part of a flexible tube or hose 31. The other end of the tube is provided with a coupling 32 for threaded connection with the swing spout 13. The coupling 32 may also be connected to the threaded portion of the swing spout 20 when it is desired to back flush the receptacle.

In operation the portion of the receptacle between the two screen partitions is filled with zeolite or other like base exchange material in granular form and the screen gate is swung to closed position and the plug is threaded into the upper head and the device is ready for use. Upon turning on the water by means of either valve 11 or 12 or both, the hard water from the pipes will flow through the spout 13, the flexible tube 31 and the inlet pipe 28, and from said inlet pipe the water will be discharged into the mixing chamber 26. The water is now free to flow downwardly through the bed of zeolite and be discharged through the receptacle swing spout 20 into either compartment of the tub. The hard water in passing through the bed of zeolite will lose its hardness, due to the base exchange quality of the zeolite, and be discharged through the swing spout in a softened condition.

When the softening capacity of the zeolite is exhausted, it may be easily restored by placing salt into the mixing chamber or pouring a brine solution therein and permitting the brine to percolate through the zeolite for a few minutes and then flush the brine from the zeolite by turning on the hot or cold water. This also is accomplished in a few minutes and the device is again ready for use. This rejuvenating operation can be repeated indefinitely without loss of efficiency.

In some installations where the water is not very clear and contains considerable foreign matter, the upper screen and the upper portion of the bed of zeolite may hold some of the foreign matter, and to remove the same the coupling 30 is disconnected from the elbow 29 and connected to the swing spout 20. Now upon turning on the water by means of one of the valves, the pressure will cause the water to flow upwardly through the bed of zeolite and the upper screen partition and dislodge the foreign matter therefrom and it will be discharged through the pipe 28 and the elbow 29. After the back flushing operation, the zeolite bed may be treated with the brine solution in the manner before described.

From the foregoing description it will be seen that the attachable water softener is of very simple construction and is well adapted for the purpose described.

What I claim as my invention is:

1. A water softener for connection with a two compartment laundry tub and water supply pipes having valves and a swing spout, said swing spout having a threaded discharge end, comprising a receptacle clamped to and supported from one of the supply pipes, an inlet tube extending upwardly in the receptacle to a point adjacent its upper end, screen partitions in spaced relation within the receptacle and through which the inlet tube passes, the upper screen having a charging opening closed by a gate, a flexible tube having couplings at its outer ends which are threaded to the swing spout and to the lower end of the inlet tube, a swing spout connected to and positioned beneath the lower end portion of the receptacle

for discharging softened water into either compartment of the tub, a water softening material within the receptacle between the screens and through which the water passes before being discharged through the receptacle swing spout, said receptacle having an upper opening permitting the entrance of a medium for restoring the water softening quality of the material when it becomes exhausted, and a closure for the upper opening.

2. A water softener for connection with a two compartment laundry tub and water supply pipes having valves and a swing spout, comprising a receptacle supported from one of the supply pipes and having a water inlet tube extending upwardly therein, a flexible tubular connection between the swing spout and the receptacle inlet tube, said receptacle beneath its lower end having a swing spout for discharging softened water into either tub compartment or for receiving backwashing water, a water softening material within the receptacle and through which the water passes downwardly before being discharged through the receptacle swing spout, said flexible tubular connection when disconnected from the inlet tube and connected to the receptacle swing spout serving as a means for directing a back washing flow of water from the swing spout of the supply pipes to the swing spout of the receptacle and upwardly through the material in said receptacle, and means permitting charging the receptacle with a medium for restoring the water softening quality of the material when it becomes exhausted.

3. A water softener for connection with a two compartment laundry tub and water supply pipes having valves and a swing spout, said swing spout having a threaded discharge end, comprising a receptacle clamped to and supported from one of the supply pipes, an inlet tube extending upwardly in the receptacle to a point adjacent its upper end, screen partitions in spaced relation within the receptacle and through which the inlet tube passes, the upper screen having a charging opening closed by a gate, a flexible tube having couplings at its outer ends which are threaded to the swing spout and to the lower end of the inlet tube, a swing spout connected to and beneath the lower portion of the receptacle, for discharging softened water into either compartment of the tub, a water softening material within the receptacle between the screens and through which the water passes before being discharged through the receptacle swing spout, said flexible tube when disconnected from the inlet tube and connected to the receptacle swing spout serving as a means for directing a back washing flow of water from the swing spout of the supply pipes to the swing spout of the receptacle and upwardly through the water softening material, said receptacle having an upper opening permitting the entrance of a medium for restoring the water softening quality of the material when it becomes exhausted, and a closure for the upper opening.

4. An attachable water softener, comprising a receptacle for holding a bed of water softening material and having a charging opening at its upper end portion, means for clamping the receptacle to a support, a water discharge swing spout positioned beneath and connected to the lower end portion of the receptacle, screen partitions within the receptacle for holding the material between the partitions, a tube extending into the receptacle and through the partitions, a flexible tube removably connected at one end either to the receptacle tube or the swing spout

and having means at its opposite end for connection with a source of water supply, said charging opening permitting the insertion of a medium into the receptacle to rejuvenate the material when its water softening quality becomes exhausted, and an easily removable closure for the charging opening.

5 An attachable water softener, comprising a tubular receptacle having an upper and a lower headed end, said upper headed end having a charging opening, means for clamping the receptacle to a water supply pipe, a water discharge swing spout connected to the lower end head and having an outer threaded end, an upper and a lower screen partition within the re-

ceptacle, the upper partition having a charging opening and a closure therefor, a water softening material between the partitions, a tube extending into the receptacle and through the partitions, a flexible tube having at one end means for connection with the receptacle tube or the threaded end of the swing spout and at its other end means for connection with a source of water supply, said charging opening of the upper end head permitting the insertion of a medium into the receptacle for rejuvenating the material when its water softening quality becomes exhausted, and an easily removable closure for the upper headed end charging opening.

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