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DEVICE FOR CLEANING AND FLUSHING PIPES

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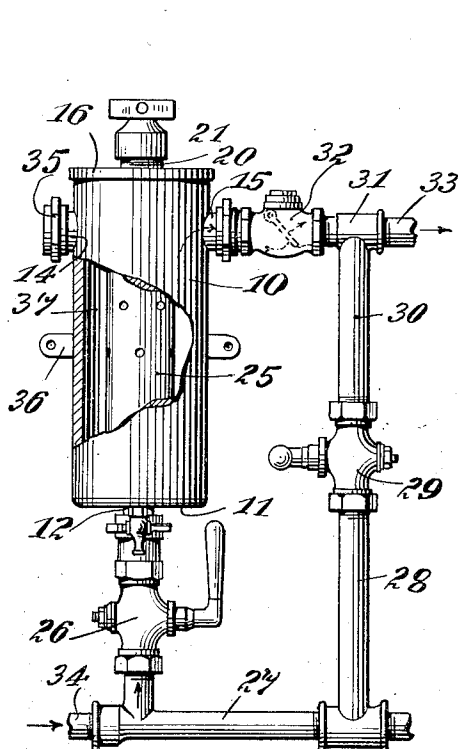


Fig. 1.

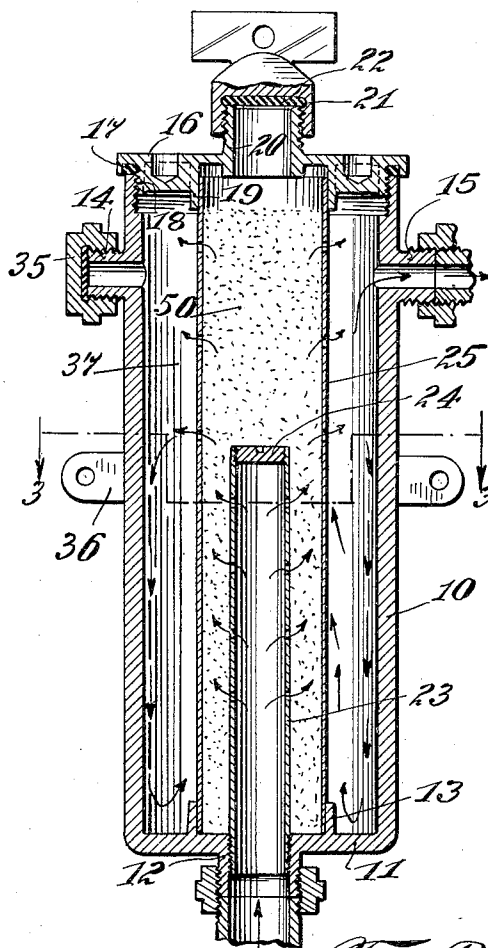


Fig. 2.

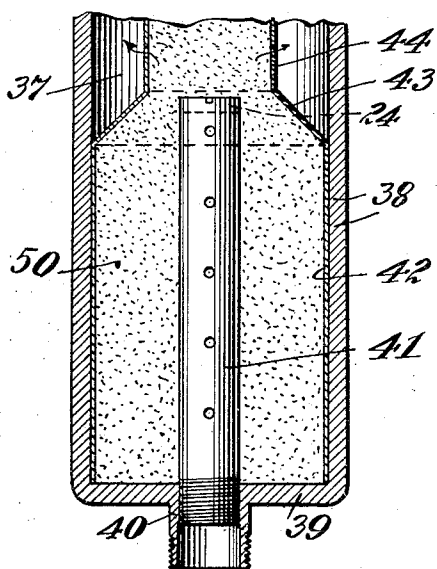


Fig. 4.

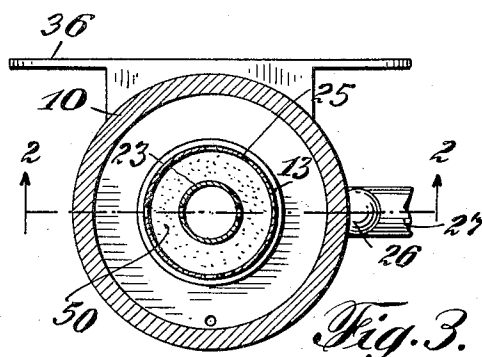


Fig. 3.

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DEVICE FOR CLEANING AND FLUSHING
PIPES

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20 Claims. (Cl. 225—13)

Our invention relates to devices for the cleaning and flushing of pipes and refers particularly to devices adapted for the use of chemical solutions for that purpose.

5 While our device is adapted for the cleansing of deposits from any pipes, where such deposits are affected by chemical solutions, it is particularly adapted for the cleansing of pipes through which beer has been passed.

10 In the dispensing of beer it is customary to force the beer from containers, such as kegs or barrels, through cooled pipes to the faucets. During this process the pipes become fouled materially affecting the beer and hence it is necessary to thoroughly remove the deposited materials and to flush the pipes until they are completely purified.

For this purpose the application of a chemical cleansing, or detergent, compound in the solution is required, followed by a complete removal of the chemical by a fresh water flushing.

15 In order that such treatment may be both effective and economical, it is essential that the first portion of the cleansing solution passed through the pipes be strongly impregnated with the chemical, thus causing a strong effect upon the fouling materials in order to cause their destruction and removal.

20 The device of our invention accomplishes these desirable results, as will be evident upon a consideration of the accompanying drawing, in which similar parts are designated by similar numerals.

Figure 1 is a side view of one form of our device, partly broken away for purposes of description.

35 Figure 2 is an enlarged vertical cross section of the device shown in Figure 1.

Figure 3 is a section through the line 3—3 of Figure 2.

40 Figure 4 is a broken vertical cross section of a modified form of our device.

The particular form of the device of our invention, illustrated in Figures 1, 2 and 3, consists of an outer casing having the annular side 10 and the bottom 11, the latter having an outwardly extended pipe section 12, the inner and outer faces of which are threaded. The bottom 11 also carries the inwardly extended annular boss 13.

45 The side 10 carries the two pipe sections 14 and 15, the outward faces of which are threaded.

50 A removable cover 16 for the casing has an annular recess 17 for the reception of the receptacle side 10, an inwardly extended annular boss 18, the outer face of which is threaded; an inwardly extended annular boss 19; and an outwardly ex-

tended pipe section 20, the outer face of which is threaded. The cover 16 is attached to the casing by screwing down thereon, the threads of the boss 18 meshing with threads upon the inner face of the upper portion of the casing side 10. A cap 21 is capable of being threaded over the top of the pipe extension 20, a rubber gasket 22 being employed if necessary.

55 A perforated liquid supply pipe 23 is threaded within the pipe section 12, the top of the supply pipe being closed by the cap 24.

A perforated chemical container consisting of the tubular member 25 is maintained in upright position by the boss 13 of the casing bottom 11 and the boss 19 of the cover 16, the perforations being preferably in the upper portion thereof.

60 The pipe section 12 of the casing bottom 11 carries the valve 26, which is connected to the pipe 27, which is connected to the pipe 28, carrying the valve 29. The valve 29 is connected to the pipe 30 which is connected to the coupling 31. The coupling 31 is connected to the pipe section 15 of the casing side 10 by means of the check valve 32 and to the pipes to be cleaned and flushed by means of the pipe 33. The pipe 27 is connected to a supply of fresh water by means of the pipe 34.

A cap 35 closes the pipe section 14 of the casing side 10, and a strap 36 around the casing is adapted to retain the device upon a desirable support.

The operation of the device is as follows:

65 The cover 16, or the cap 21, is removed and the necessary chemical 50 in solid form is introduced into the chemical container and the cover, or the cap, replaced. Valve 26 is opened and valve 29 is closed. Fresh water is then allowed to enter through the pipe 34. This water passes upwardly through the valve 26, through the perforations in the water supply pipe 23 into the chemical container, where it dissolves the chemical, passes outwardly through the perforations in the chemical container wall into the chamber 37 and thence through the valve 32, the coupling 31 and the pipe 33 into and through the pipes to be cleaned and flushed, the flow of water being continued until such pipes are thoroughly cleaned.

70 It is evident that when all of the chemical has been dissolved and the solution passed through the system, clear water will pass through the device and will flush all of the chemical solution from the pipes to be cleaned.

75 If, however, it is desired to otherwise flush the pipes, the valve 26 is closed and the valve 29 is

opened. The clear water then passes through the system 27, 28, 29, 30, 31, and 33, the check valve 32 preventing it from entering the casing.

The modification of our device shown in Figure 4 consists of a casing having the annular side 38 and the bottom 39, the latter having the extended pipe section 40, the inner and outer faces of which are threaded. A perforated water supply pipe 41 is threaded into the pipe section 40. A chemical container consists of the annular side 42 abutting upon the inner face of the casing side 38, the converging shoulder 43 and the upwardly extended tubular portion 44, said tubular member 44 being perforated. The remainder of the device is similar to that shown in Figures 1, 2 and 3 and described therewith.

In the operation of this modified form of our device, the clear water enters the water supply pipe 41, passes through the perforations therein, enters the chemical container, dissolves the chemical, passes through the perforations in the tubular member 44 into the chamber and thence outwardly through the system into the pipes to be cleaned.

It will be noted that in both of these devices, the first portion of clear water fed into the device passes through a larger quantity of chemical than does that which follows and that, therefore, the first quantity of liquid passing through the pipes to be cleaned contains a larger quantity of chemical than does the following solution, and this is a most valuable feature of the device, as it is desirable to treat the deposited impurities with as strong a solution as possible in order to dislodge, dissolve and remove them. The operation can thus be performed much more economically and rapidly than if a weaker solution is applied to these deposits.

It will thus be seen that our invention presents a device which will efficiently remove deposits from beer pipes and other pipes, followed by a thorough flushing to remove the chemicals employed in the process.

We do not limit ourselves to the particular size, shape, number or arrangement of parts as shown and described, as these are given simply as a means for clearly describing the device of our invention.

What we claim is:—

1. In a device adapted for the cleansing and flushing of pipes, in combination, a closed casing having an inlet opening and an outlet opening, an inwardly extended perforated pipe connected with one of said openings, a closed chemical container surrounding said perforated pipe in spaced relation therewith and having a perforated wall spaced from a wall of said casing, a closure in common for said casing and for said container adapted to open and close said casing and said container simultaneously, said closure having an opening through it into said container, and a closure for said opening carried by said closure in common and adapted to be opened.

2. In a device adapted for the cleansing and flushing of pipes, in combination, a closed tubular casing having an opening in one of its end closures, a perforated pipe connected with said opening extending only part way through said casing towards the other end of the latter and having its inner end closed, and a tubular chemical container within and extending from end to end of said casing and having its opposite ends closed by the opposite end closures of said casing, said container having one end portion only there-

of provided with perforations and having its other end portion only surrounding said perforated pipe in spaced relation therewith, at least the perforated portion of said container being spaced from the surrounding side wall of said casing, said casing being provided with another opening which communicates with the space between said container and the surrounding side wall of said casing, one of said openings forming an inlet and the other an outlet.

3. In a device adapted for the cleansing and flushing of pipes, in combination, a closed tubular casing having an opening in one of its end closures, a perforated pipe connected with said opening extending only part way through said casing towards the other end of the latter and having its inner end closed, a tubular chemical container within and extending from end to end of said casing and having its opposite ends closed by the opposite end closures of said casing, said container having one end portion only thereof provided with perforations and having its other end portion only surrounding said perforated pipe in spaced relation therewith, at least the perforated portion of said container being spaced from the surrounding side wall of said casing, said casing being provided with another opening which communicates with the space between said container and the surrounding side wall of said casing, one of said openings forming an inlet and the other an outlet, said casing also having an opening through its other end closure into the perforated end portion of said container, and a closure for the latter opening adapted to be opened.

4. In a device adapted for the cleansing and flushing of pipes, in combination, a closed tubular casing, a closed tubular chemical container within and extending longitudinally of said casing, said casing having an opening in one of its end closures, and an inwardly extended perforated pipe connected with said opening extending into one end of and part way only through said container towards the other end of the latter and having its inner end closed, said container having an imperforate end portion surrounding said perforated pipe in spaced relation therewith and having its other end portion perforated and extended beyond the end of said pipe, at least the perforated portion of said container being spaced from the surrounding side wall of said casing, said casing being provided with another opening which communicates with the space between said container and the surrounding side wall of said casing, one of said openings forming an inlet and the other an outlet.

5. In a device adapted for the cleansing and flushing of pipes, in combination, a closed tubular casing, a closed tubular chemical container within and extending longitudinally of said casing, said casing having an opening in one of its end closures, and an inwardly extended perforated pipe connected with said opening extending into one end of and part way only through said container towards the other end of the latter and having its inner end closed, said container having an imperforate end portion surrounding said perforated pipe in spaced relation therewith and having its other end portion perforated and extended beyond the end of said pipe to the end of said casing and closed at its end by the other end closure of said casing, at least the perforated portion of said container being spaced from the surrounding side wall of said casing, said casing being provided with another opening which communicates with the space between said container and the sur-

rounding side wall of said casing, one of said openings forming an inlet and the other an outlet.

6. In a device adapted for the cleansing and flushing of pipes, in combination, a closed tubular casing, a closed tubular chemical container within and extending longitudinally of said casing, said casing having an opening in one of its end closures, an inwardly extended perforated pipe connected with said opening extending into one end of and part way only through said container towards the other end of the latter and having its inner end closed, said container having an imperforate end portion surrounding said perforated pipe in spaced relation therewith and having its other end portion perforated and extended beyond the end of said pipe to the end of said casing and closed at its end by the other end closure of said casing, at least the perforated portion of said container being spaced from the surrounding side wall of said casing, said casing being provided with another opening which communicates with the space between said container and the surrounding side wall of said casing, one of said openings forming an inlet and the other an outlet, said casing also having an opening through its said other end closure into the perforated end portion of said container, and a closure for the latter opening adapted to be opened.

7. In a device adapted for the cleansing and flushing of pipes, in combination, a closed tubular casing, a closed tubular chemical container within and extending longitudinally of said casing, said casing having an opening in one of its end closures, an inwardly extended perforated pipe connected with said opening extending into one end of and part way only through said container towards the other end of the latter and having its inner end closed, said container having an imperforate end portion surrounding said perforated pipe in spaced relation therewith and having its other end portion perforated and extended beyond the end of said pipe to the end of said casing, at least the perforated portion of said container being spaced from the surrounding side wall of said casing, said casing being provided with another opening which communicates with the space between said container and the surrounding side wall of said casing, one of said openings forming an inlet and the other an outlet, a closure in common for the other end of said casing and for the end of the perforated portion of said container adapted to open and close said casing and said container simultaneously, said latter closure having an opening through it into said container, and a closure for the latter opening carried by said closure in common and adapted to be opened.

8. In a device adapted for the cleansing and flushing of pipes, in combination, a closed tubular casing having an opening in one of its end closures, a perforated pipe connected with said opening extending only part way through said casing towards the other end of the latter and having its inner end closed, a closed tubular chemical container within and extending from end to end of said casing, said container being provided with perforations in its end portion which extends beyond the end of said perforated pipe and having an imperforate other end portion surrounding said perforated pipe in spaced relation therewith and closed at its end by the end closure of said casing at this end thereof, at least the perforated portion of said container being spaced from the surrounding side wall of said casing, said casing being provided with an-

other opening which communicates with the space between said container and the surrounding side wall of said casing, one of said openings forming an inlet and the other an outlet, a closure in common for the other end of said casing and for the end of the perforated portion of said container adapted to open and close said casing and said container simultaneously, said latter closure having an opening through it into said container, and a closure for the latter opening carried by said closure in common and adapted to be opened.

9. In a device adapted for the cleansing and flushing of pipes, in combination, a closed tubular casing, a closed tubular chemical container within and extending longitudinally of said casing, said casing having an opening in one of its end closures, and an inwardly extended perforated pipe connected with said opening extending into one end of and part way only through said container towards the other end of the latter and having its inner end closed, said container being provided with perforations in its end portion which extends beyond the end of said perforated pipe and having an imperforate other end portion surrounding said perforated pipe in spaced relation therewith and closed at its end by the end closure of said casing at this end thereof, at least the perforated portion of said container being spaced from the surrounding side wall of said casing, said casing being provided with another opening which communicates with the space between said container and the surrounding side wall of said casing, one of said openings forming an inlet and the other an outlet.

10. In a device adapted for the cleansing and flushing of pipes, in combination, a closed tubular upright casing having an inlet opening through its bottom, an upwardly extended perforated pipe connected with said opening extending only part way through said casing towards its top and having its upper end closed, and a closed tubular upright chemical container within and extending from the bottom to the top of said casing and having its lower and upper ends closed by the bottom and the top respectively of said casing, said container having its upper end portion only provided with perforations and having its lower end portion only surrounding said perforated pipe in spaced relation therewith, said perforated portion at least of said container being spaced from the surrounding side wall of said casing, said casing being provided with an outlet opening from the space between said container and the surrounding side wall of said casing.

11. In a device adapted for the cleansing and flushing of pipes, in combination, a closed tubular upright casing having an inlet opening through its bottom, an upwardly extended perforated pipe connected with said opening extending only part way through said casing towards its top and having its upper end closed, a closed tubular upright chemical container within and extending from the bottom to the top of said casing and having its lower and upper ends closed by the bottom and the top respectively of said casing, said container having its upper end portion only provided with perforations and having its lower end portion only surrounding said perforated pipe in spaced relation therewith, said perforated portion at least of said container being spaced from the surrounding side wall of said casing, said casing being provided with an outlet opening from the space between said container and the surrounding side wall of said casing, said casing also having an opening through its top into the upper

end of said container, and a cover for the latter opening adapted to be opened.

12. In a device adapted for the cleansing and flushing of pipes, in combination, a closed tubular upright casing, a closed tubular upright chemical container within said casing, said casing having an inlet opening through its bottom, and an upwardly extended perforated pipe connected with said opening extending into the lower end of and part way only upwardly through said container towards the upper end of the latter and having its upper end closed, said container having an imperforate lower end portion surrounding said perforated pipe in spaced relation therewith and having its upper end portion perforated and extended above the upper end of said pipe, said perforated portion at least of said container being spaced from the surrounding side wall of said casing, said casing being provided with an outlet opening from the space between said container and the surrounding side wall of said casing.

13. In a device adapted for the cleansing and flushing of pipes, in combination, a closed tubular upright casing, a closed tubular upright chemical container within said casing, said casing having an inlet opening through its bottom, an upwardly extended perforated pipe connected with said opening extending into the lower end of and part way only upwardly through said container towards the upper end of the latter and having its upper end closed, said container having an imperforate lower end portion surrounding said perforated pipe in spaced relation therewith and having its upper end portion perforated and extended above the upper end of said pipe to the top of said casing and closed at its upper end by said top, said perforated portion at least of said container being spaced from the surrounding side wall of said casing, said casing being provided with an outlet opening from the space between said container and the surrounding side wall of said casing, said casing also having an opening through its top into the upper end of said container, and a cover for the latter opening adapted to be opened.

14. In a device adapted for the cleansing and flushing of pipes, in combination, a closed tubular upright casing, a closed tubular upright chemical container within said casing, said casing having an inlet opening through its bottom, an upwardly extended perforated pipe connected with said opening extending into the lower end of and part way only upwardly through said container towards the upper end of the latter and having its upper end closed, said container having an imperforate lower end portion surrounding said perforated pipe in spaced relation therewith and having its upper end portion perforated and extended above the upper end of said pipe to the top of said casing and closed at its upper end by said top, said perforated portion at least of said container being spaced from the surrounding side wall of said casing, said casing being provided with an outlet opening from the space between said container and the surrounding side wall of said casing, said top of said casing forming a cover in common for the upper end of said casing and for the upper end of said container adapted to open and close said casing and said container simultaneously, said cover having an opening through it into said container, and a cover for the latter opening carried by said cover in common and adapted to be opened.

15. In a device adapted for the cleansing and flushing of pipes, in combination, a closed tubu-

lar upright casing having an inlet opening through its bottom, an upwardly extended perforated pipe connected with said opening extending only part way through said casing toward the upper end of the latter and having its upper end closed, a closed tubular upright chemical container within and extending from the bottom to the top of said casing, said container being provided with perforations in its upper end portion which extends above the upper end of said perforated pipe and having an imperforate lower end portion surrounding said perforated pipe in spaced relation therewith and closed by the bottom of said casing, the perforated portion at least of said container being spaced from the surrounding side wall of said casing, said casing being provided with an outlet opening from the space between said container and the surrounding side wall of said casing, a top cover in common for the upper end of said casing and for the upper end of said container adapted to open and close said casing and said container simultaneously, said top cover having an opening through it into said container, and a cover for the latter opening carried by said top cover and adapted to be opened.

16. In a device adapted for the cleansing and flushing of pipes, in combination, a closed tubular casing having an inlet opening and an outlet opening, an inwardly extended perforated pipe connected with one of said openings, and a closed tubular chemical container within said casing and having one end portion only thereof provided with perforations and spaced from the surrounding side wall of said casing, said container having its other end portion only surrounding said perforated pipe in spaced relation therewith and fitting closely within the inner face of the surrounding side wall of said casing.

17. In a device adapted for the cleansing and flushing of pipes, in combination, a closed tubular casing having an opening in one of its end closures, a perforated pipe connected with said opening extending only part way through said casing towards the other end of the latter and having its inner end closed, and a tubular chemical container within and extending from end to end of said casing and having its opposite ends closed by the opposite end closures of said casing, said container having one end portion only thereof provided with perforations and spaced from the surrounding side wall of said casing, said container having its other end portion only surrounding said perforated pipe in spaced relation therewith and fitting closely within the inner face of the surrounding side wall of said casing, said casing being provided with another opening which communicates with the space between the perforated end portion of said container and the surrounding side wall of said casing, one of said openings forming an inlet and the other an outlet.

18. In a device adapted for the cleansing and flushing of pipes, in combination, a closed tubular upright casing having an inlet opening through its bottom, an upwardly extended perforated pipe connected with said opening extending only part way through said casing towards its top and having its upper end closed, and a closed tubular upright chemical container within and extending from the bottom to the top of said casing and having its lower and upper ends closed by the bottom and top respectively of said casing, said container having its upper end portion only provided with perforations and spaced from

the surrounding side wall of said casing, said container having its lower end portion only surrounding said perforated pipe in spaced relation therewith and fitting closely within the inner face of the surrounding side wall of said casing, said casing being provided with an outlet opening from the space between the perforated end portion of said container and the surrounding side wall of said casing.

19. In a device adapted for the cleansing and flushing of pipes, in combination, a closed tubular upright casing, a closed tubular upright chemical container within said casing, said casing having an inlet opening through its bottom, and an upwardly extended perforated pipe connected with said opening extending into the lower end of and part way only upwardly through said container towards the upper end of the latter and having its upper end closed, said container having an imperforate lower end portion surrounding said perforated pipe in spaced relation therewith and fitting closely within the inner face of the surrounding side wall of said casing, said container having its upper end portion perforated and extended above the upper end of said pipe, said perforated upper end portion of said container being spaced from the surrounding side wall of said casing, said casing being provided with an outlet opening from the space between the perforated upper end portion of said container and the surrounding side wall of said casing.

20. In a device adapted for the cleansing and flushing of pipes, in combination, a closed tubular upright casing having straight side walls and of equal internal diameter throughout its length, a closed tubular upright chemical container within said casing, said casing having an inlet opening through its bottom, and an upwardly extended perforated pipe connected with said opening extending into the lower end of and part way only upwardly through said container towards the upper end of the latter and having its upper end closed, said container having an imperforate lower end portion of the full diameter of the internal diameter of said casing and fitting closely within the inner face of the surrounding side wall of said casing, said lower end portion of said container surrounding said perforated pipe in spaced relation therewith, said container having its upper end portion perforated and extended above the upper end of said pipe, said perforated upper end portion of said container being of reduced diameter and spaced from the surrounding side wall of said casing, said casing being provided with an outlet opening from the space between the perforated upper end portion of said container and the surrounding side wall of said casing.

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