July 23, 1940. F. B. BRINK 2,208,957

COIL CLEANER

Filed June 21, 1937 3 Sheets-Sheet 1

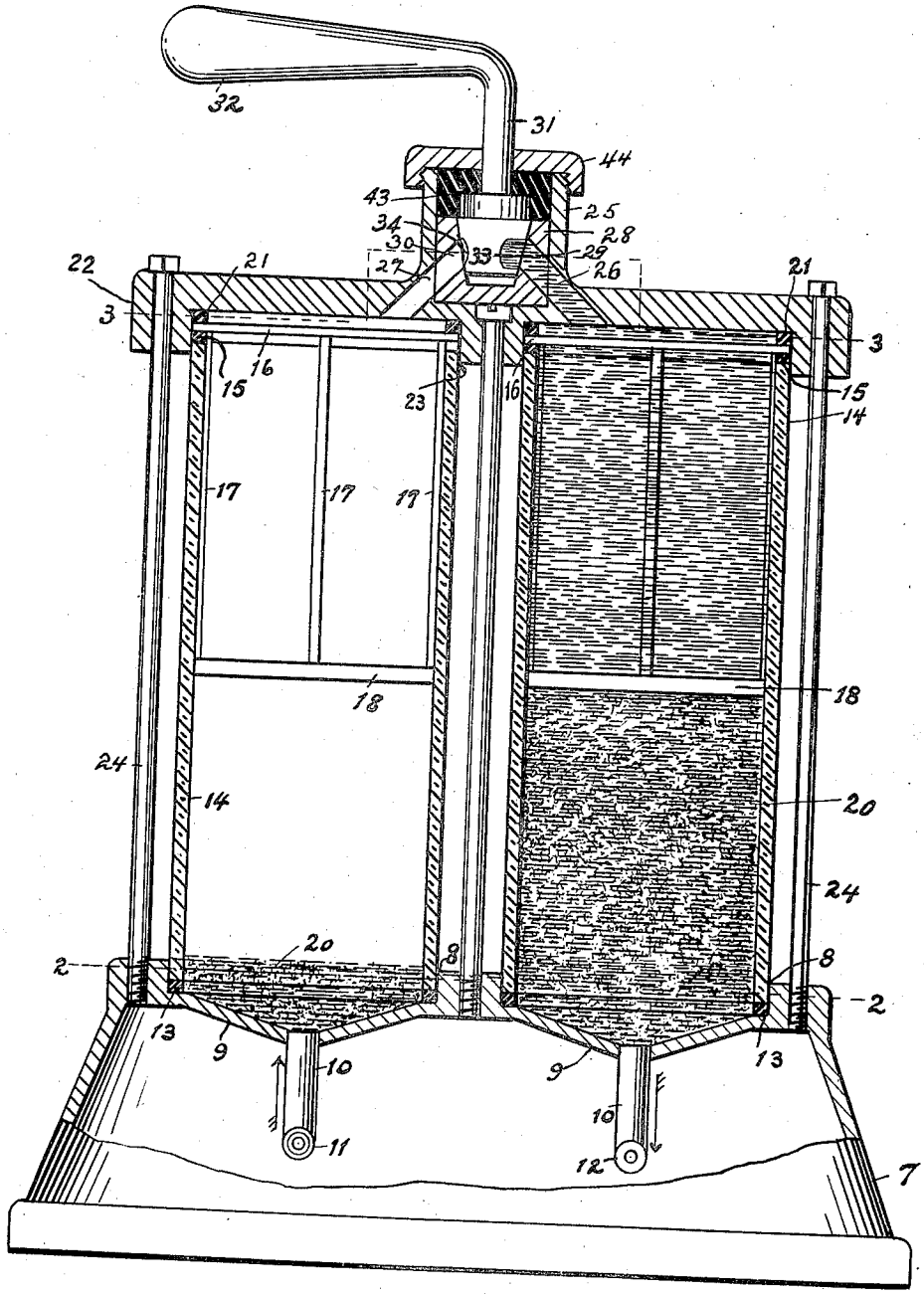



FIG. 1

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COIL CLEANER

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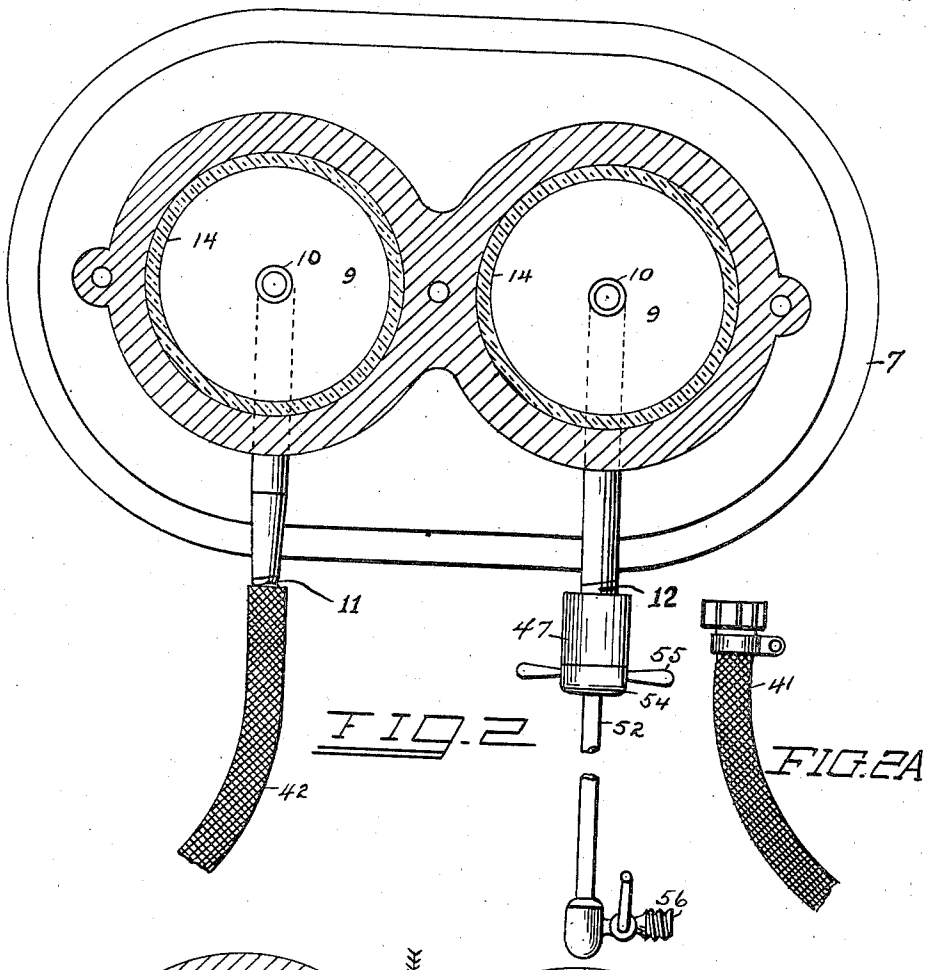



FIG. 2

FIG. 2A

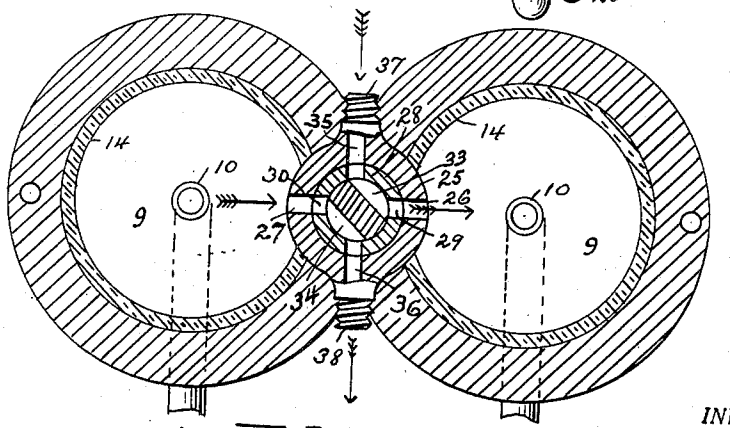



FIG 3

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COIL CLEANER

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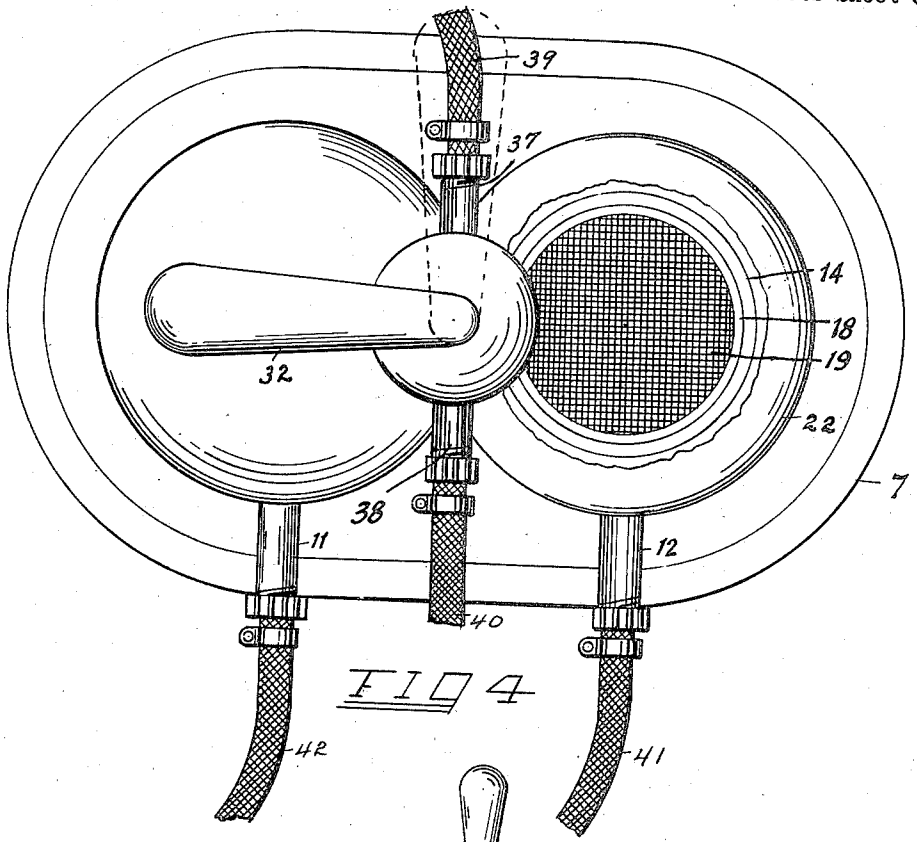



FIG 4

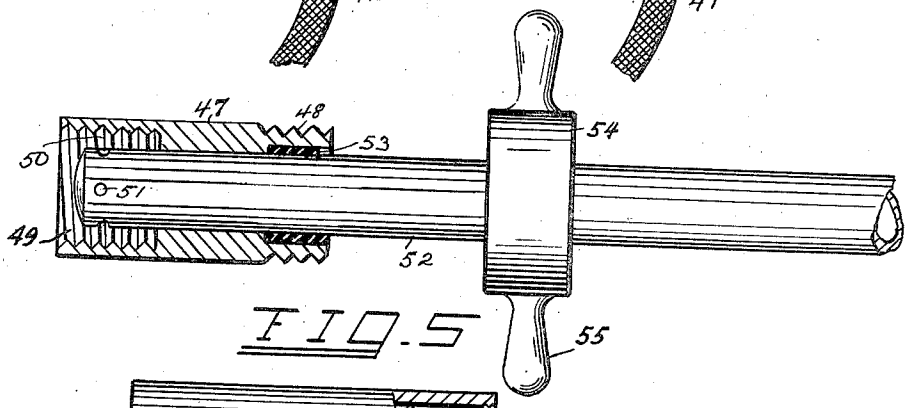



FIG 5

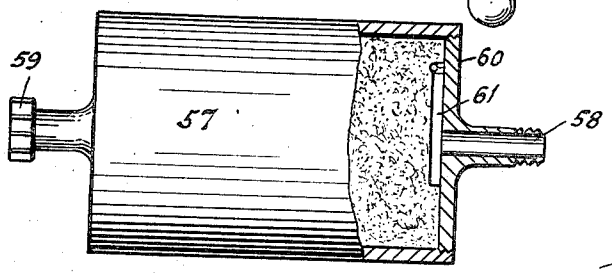



FIG 6

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Patented July 23, 1940

2,208,957

# UNITED STATES PATENT OFFICE

2,208,957

## COIL CLEANER

Fred B. Brink, Oklahoma City, Okla.

Application June 21, 1937, Serial No. 149,312

5 Claims. (Cl. 225—12)

This invention has a general reference to the art of cleaning coils that are employed in refrigerating and beverage dispensing systems, and has a more particular reference to that class of fluid and hydraulic cleaners which use an abrading material, in addition to the fluid, so that the mixed fluid and abrading material may pass through the pipes, coils, and draft or tap rods, under pressure, to secure a proper and efficient scouring of the inner wall of such pipes, coils, and draft or tap rods.

It is also an object of the invention to separate the fluid and the abrasive material at a proper time, after cleansing, so that the fluid, as such, may be examined to determine the extent of cleansing, by observing the clarity of the fluid.

Refrigerating coils, pipes, and dispensing coils, pipes, draft and tap rods undergo bacterial incrustation, and in them also is formed a deposit, usually in the form of slime, which develops from the ingredients of the beverages, or the refrigerating salts and chemicals which pass through these pipes.

This substance must not only be removed, but, in the case of beverage dispensers, the results of cleaning acids, chlorides or other chemicals must be removed, else the beverage will taste both of the chemicals and salts, and their action on the metal of the pipes, coils, rods, faucets and other appurtenances.

It is therefore desirable to scrub the inside wall of the pipe, coil, draft and tap rods, and the attached valves, and allow the abrasive material to thoroughly clean these walls, instead of attacking them with obnoxious chemicals.

To this end, means are provided for mixing an abrasive material with water, causing the mixture to surge through the pipes, coils, draft or tap rods, and the valves, and return the abrasive material for deposit in the machine, and send the water for inspection, and then for emission into the waste.

One of the objects of the invention is to so control the movement of the abrasive material after functioning, that the same may be separated from the water, allowing the latter to rise for inspection in the machine before discharge, and thus permit proper determination of the cleaning operation of the device. This permits the relative clarities of the water to determine the extent of the cleaning operation.

Other objects of the invention will appear from a further and complete reading of the following specification.

On the sheets of drawings, accompanying and forming a part of the specification,

Figure 1 is an elevation view in section, primarily, of an apparatus made in accordance with this invention,

Figure 2 is a sectional view in plan on line 2—2 of Figure 1.

Fig. 2A is a detail view in side elevation of a section of hose for connecting bib 12 with a coil.

Figure 3 is a like plan view with part of the top in section,

Figure 4 is a top plan view of the assembly,

Figure 5 is a detail view in side elevation of a tap rod cleaner, and

Figure 6 shows an abrasive material reservoir for removing the abrasive material from and furnishing it to the device when desired.

In these several views, similar characters of reference will indicate like parts.

A base 7, may be constructed especially for the purpose of stability, and as cheaply as is constructively possible, and is provided with two hoppers 8, terminating in inverted bottom 9, proceeding from the bottom of which are flow pipes 10 which terminate in one instance in a nipple 11 and in the other in a bib 12.

In seats formed about the upper edge of the hoppers 9 are gaskets 13, upon which are placed transparent cylinders 14, and upon the upper edge of each of these cylinders is placed gasket 15 preparatory to applying a frame 16 from which depend legs 17, sustaining in suspension a frame 18 in which is contained a screen 19. These frames and screens are, of course, in each cylinder 14, and below them in one of the cylinders is a quantity of abrasive material 20 trapped by the screen 19 so that when the flow of water through either conduit 10 is commenced, the same passes through these screens into the upper part of the cylinders, leaving the abrasive material 20 below the screen.

Placed upon the rim 18 is a gasket 21 before the application of a head 22 having cylinder-receiving wells 23. This head is secured to the base 7 by elongated bolts 24, so that the head, base and cylinders will become leakproof by the intervention of the aforesaid gaskets.

This head 22 is provided with an upstanding shell 25 cast integral with the head 22, and through both the shell and the head are bored ducts 26 and 27 which communicate with the cylinders 14.

Within this shell 25 is sweated a bronze seat-bushing 28 having ducts 29 and 30 complementary to the ducts 26 and 27. In a tapering seat in

this bushing 28 is a stem 31 operable by a handle 32, and this stem is undercut at 33 and 34 horizontally across the axis of the same. The shell 25 is also provided with ducts 35 and 36 (see Figure 3) which terminate in bibs 37 and 38, for the attachment of sections 39 and 40 of hose, the former attachable to a supply source, and the other leading to a drain.

The undercuts 33 and 34 are so formed diagonally across the valve stem 31 that when the handle 32 is turned, for instance, as shown, there will be a communication of flow from 39, through 35, into 33, through 26 into the right hand cylinder 14 of Figure 1. A section of hose 41 is applied to the bib 12 and this hose is applied to a coil or other portion of a refrigerating or beverage dispensing circulating system.

To the other opening of such system is attached a section of a return hose 42, which may be slipped onto the nipple 11 of the conduit entering the hopper of the opposite cylinder. This forms a communication between the two cylinders, and the flow commences to surge through the coil system, carrying the abrasive material 20 from the right hand cylinder of Figure 1 on through, and scour the pipes, and flow up to the left hand cylinder of Figure 1. The screen 19 in the frame 18 will hold back the abrasive material 20 while the water fills the left hand cylinder and shows by the clarity of the fluid, the extent to which the cleansing has been accomplished. With the valve in the position indicated, the waste will flow through 27, 30, 34, 36, and 38 out into the waste hose 40.

If, on inspecting the clarity of the water, traces of substances will appear, the handle 32 may be turned, for instance, as indicated, in dotted lines of Figure 4, and the reversal operation may be had, and by turning the handle as desired, the cleansing operation may be carried on indefinitely until the clarity of the water seen above the traps is satisfactory.

For maintaining the valve in place, a gasket 43 not only rests upon, but surrounds the upper end of the valve 30, and this is held in place by a cap 44 screwthreaded in place on the shell 25. This makes a simple, effective and inexpensive means of valve construction.

By reference to Figure 2, it will be noted that the hose section 41 has been removed from the bit 12, for allowance of an attachment 47 involving an exteriorly screw-threaded portion 48 and an interiorly screw-threaded portion 49 about a chamber 50, providing a circulating chamber 50 for the entrance and emission of sand and water through the orifices 51 of a tap or draft rod 52 which passes through the bore of the member 47 and is packed off by a gasket 53 which is pressed into place by a cap 54 turnable by finger pieces 55.

When it is desired to cleanse the rods, the hose connection 46 is removed from the bib 12 and the element 47 is applied in its place. Then the hose connection 41 is applied to the valve end 56 of the rod 52 when the circuit will again be complete with the intervening tap or draft rod. This will permit the abrasive material and water to circulate through the coils, the rods and the cylinders until the coils and the rods are thoroughly cleansed.

It may be expedient at times to withdraw entirely the abrasive material 20 from the cylinders 14 either for cleansing by the latter or for replacement of new material. In this case, either hose 41 or 42 may be removed, more particularly 41, and a container 57 may be interposed in the line. This container is simply provided with bibs 58 and connections 59 so that upon removal of the hose 41, the connection 59 may be applied to the bib 12, while the hose connection 46 may be applied to the bib 58. When circulation is commenced the abrasive material will flow into the container 47. The bib 58, in the present instance is formed with a head 60 screw-threaded into the container 56 and to this head 60 is floated a trap valve 61 hinged at 62 to the inside of the head. In this way when the flow is container-wise from the cylinders 14, the flow may pass through the trap which will be so finely meshed as to hold back the abrasive material.

It will now be seen that there is provided a simple means whereby cleaning may be scouringly and abrasively accomplished, without allowing the abrasive to pass trapping points in the cylinders, and which traps provide means for an inspection of the water, beyond the abrasive material trapping point, thus allowing for such clarity observation as may be permitted as the cleansing operation continues.

Having thus set forth the invention, I claim:

1. A device of the class described comprising a base, hoppers in said base and each providing a seat, a nipple projecting from each hopper, transparent cylinders extending each from one of said seats, a gasket interposed between each cylinder and its seat, a head providing an inverted seat for each cylinder, gaskets interposed between each cylinder and the inverted seat receiving the same, a frame clamped between the last mentioned gaskets of each cylinder, legs depending from said frame, a second frame carried by said legs and arranged in the associated cylinders, a screen in said frame, a shell carried by said head, a valve bushing in said shell, said shell and said bushing having complementary channels arranged to form passages communicating one with each cylinder, said shell having an inlet port and an outlet port each positioned to communicate with one of said passages, a valve seated in said shell and means for operating said valve, said valve being formed to place said ports and passages in communication and movable to direct flow selectively from one inlet port to either passage and the discharge to the other passage.

2. A device of the class described, comprising a base consisting of a footing, side walls and a cap, hoppers in said cap and each provided with a seat, outlets for each hopper, transparent cylinders extending each from one of said seats, a gasket interposed between said cylinders and its seat, a head providing an inverted seat for said cylinders, gaskets interposed between the cylinders and the inverted receiving seat, a screen interposed between the upper and lower ends of said cylinders and adapted to be retained in such interposed position, a shell carried by said head, a valve bushing in said shell, said shell and said bushing having complementary channels arranged to form passages communicating one with each cylinder, said shell having an inlet port and an outlet port each positioned to communicate with one of said passages, a valve seated in said shell and means to operate the valve, said valve being formed to place said ports and passages in communication and movable to direct the flow selectively from the inlet port to either passage and the discharge to the other passage.

3. A device of the class described comprising a base, hoppers in said base and each provided

with a seat, nipples entering each hopper for both draining and filling, transparent cylinders extending each from one of said seats, a gasket interposed between the cylinders and their seats, a head provided with an inverted seat for each cylinder, gaskets interposed between each cylinder and the inverted seat receiving the same, a frame locatable centrally of the length of each cylinder, a screen in said frame to trap alternately rock in each cylinder after it has flowed through a channel, a shell carried by said head, a valve bushing in said shell, said shell and said bushing having complementary channels arranged to form passages communicating one with each cylinder, said shell having an inlet port and an outlet port each positioned to communicate with one of said passages, a valve seated in said shell and means for operating the valve, said valve being formed to place said ports and passages in communication and movable to direct flow selectively from the inlet port to either passage and the discharge to the other passage.

4. In a device as set forth, the combination with a base, hoppers in said base and each provided with a seat, nipples projecting downwardly and outwardly from the hopper bottoms, transparent cylinders extending each from one of said seats, and adapted to alternately receive water and abrasive material, a gasket interposed between each cylinder and its seat, a head providing an inverted seat for each cylinder, gaskets interposed between each cylinder and the inverted seat receiving the same, a frame held in place intermediate the length of each cylinder for alternately trapping abrasive material below the central portion of each cylinder as the same flows from nipple to nipple, a shell carried by said head, a valve bushing in said shell, said shell and said bushing having complementary channels arranged to form passages communicating one with each cylinder and through which the water may surge, a valve seated in said shell and means to operate the valve, said valve being formed to place said ports in communication and movable to direct flow selectively and alternately from one cylinder to the other from the inlet port, and the discharge from the cylinders to the other passage.

5. In a device as set forth, the combination with a base having hoppers, of nipples proceeding from the hoppers, hose connections on said nipples, a pair of transparent cylinders mounted on the base, a head for the cylinders, a valve carried by the head and having ports communicating selectively with the cylinders, a pair of connections carried by the valve for an inflow of water and an outflow of waste, a valve stem having undercuts to communicate both with the inlet to one cylinder and the outlet from the other cylinder, means to operate the valve, an abrasive material flowable from one cylinder to the other, an abrasive trapping screen laying across the interior of each cylinder and intermediate the length of each cylinder to hold the abrasive material below the traps to permit inspection of the fluid above the traps, hose connections for the valve.

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