United States Patent [19]

Brown

[11] **3,830,248**

[45] **Aug. 20, 1974**

[54] **FAUCET AND LINE CLEANING APPARATUS**

[76] Inventor: **Jerome D. Brown,** 3237 Par Dr., La Mesa, Calif. 92041

[22] Filed: **Apr. 19, 1973**

[21] Appl. No.: **352,533**

[52] **U.S. Cl.** ..... **134/100,** 134/166 C, 134/198

[51] **Int. Cl.** **B08b 3/08,** B08b 9/06

[58] **Field of Search** ..... 134/93, 100–102, 134/166 C–169 C, 170, 198

[56] **References Cited**

UNITED STATES PATENTS

680,836	8/1901	Birkholz	134/170 X
2,014,663	9/1935	Nebraske	134/198
2,016,926	10/1935	Josepowitz	134/101 X
2,098,525	11/1937	Smith	134/93
2,583,982	1/1952	Zwosta et al	134/166 C X
2,760,365	8/1956	Norton	134/198 X
3,132,656	5/1964	Rankin	134/170 X
3,368,571	2/1968	Honorof	134/100

Primary Examiner—Robert L. Bleutge

[57] **ABSTRACT**

An apparatus for flushing and pressure soaking hydraulic fluid handling lines, with a determinably concentrated cleaning admixture; and for simultaneously cleaning the internal workings of the faucets involved therewith. Beer dispensing lines and faucets are adapted to be cleaned in order to eliminate the build-up therein which causes off-taste beer. The apparatus is portable and devoid of hydraulic complexities, and it involves a pressured water supply, an admixing means with a supply of cleaner measurably applied, and a canister to contain the internal workings of the faucet, and all of which is connected to a line to be cleaned, there being inlet and outlet valves for the sequential filling, soaking and rinsing operations that inherently follow in said order.

23 Claims, 4 Drawing Figures

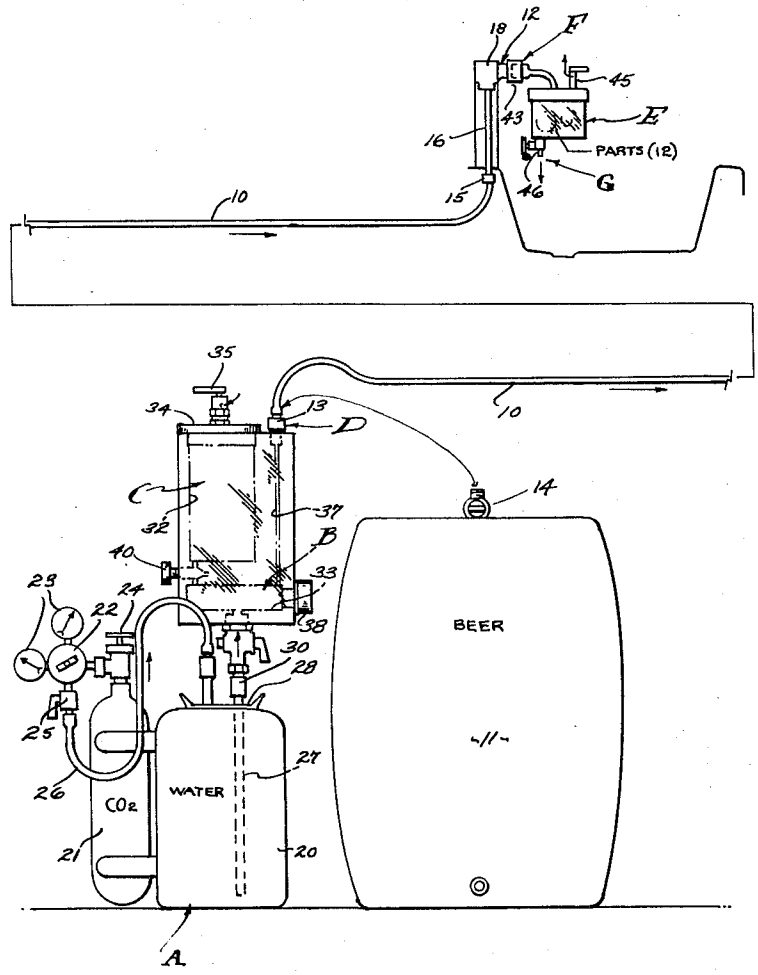


FIG. 1.

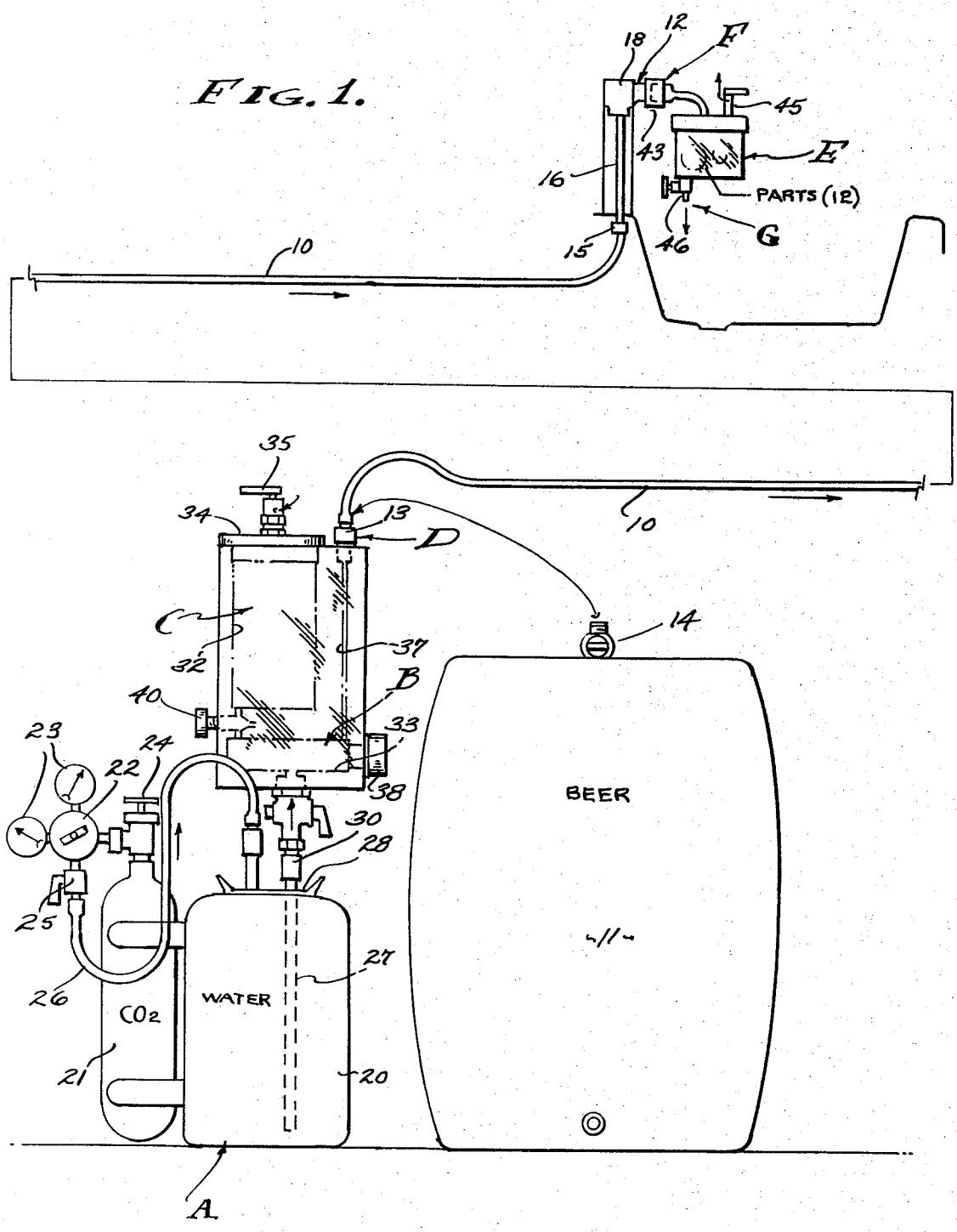

18
12
F
45
43
E
16
PARTS (12)
G
46
15
10
35
34
13
D
10
C
14
37
32
B
40
33
23
24
22
38
30
28
25
BEER
27
26
CO2
WATER
21
20
A

FIG. 2.

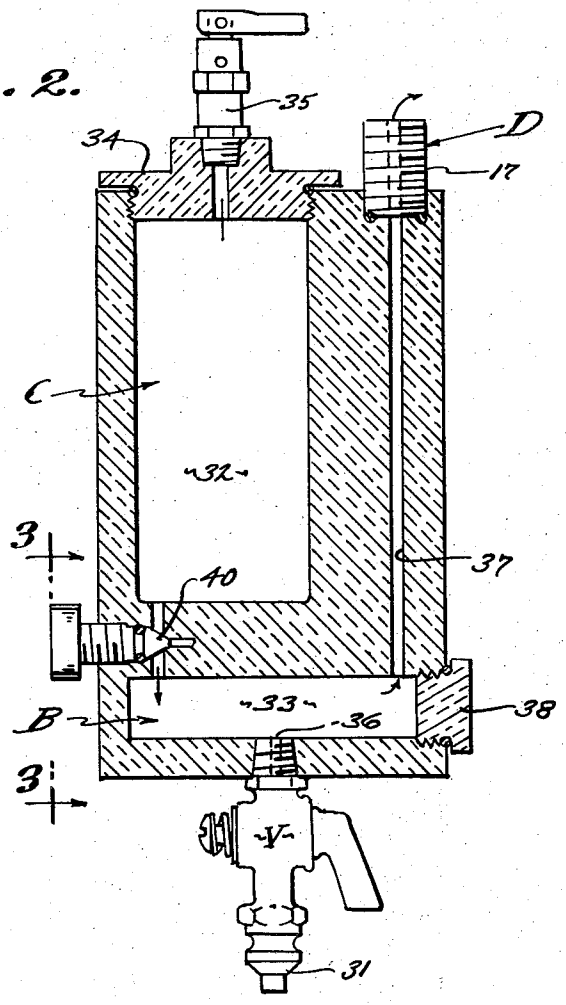


FIG. 3.

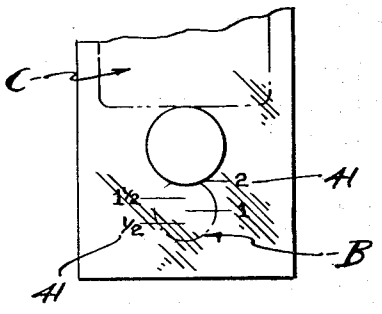
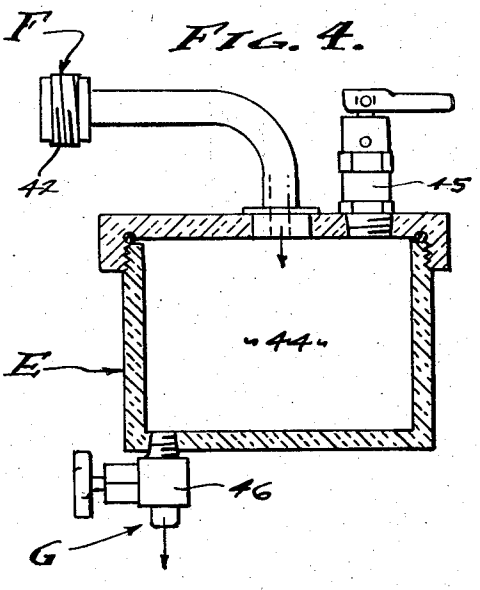


FIG. 4.



FAUCET AND LINE CLEANING APPARATUS

BACKGROUND

This invention relates to apparatus adapted to clean beer lines and faucet parts, in order to prevent the build-up of yeast or "beer stone." Although other hydraulic systems can be cleaned or purged by the apparatus hereinafter disclosed, it is a beer dispensing system to which it is particularly adaptable. Generally, a beer dispensing system involves a tube of known diameter up to 100 feet long or more, extending from a beer keg or barrel to a faucet. Various tube fittings (or pipe) are employed for the unobstructed passage of beer to the dispensing faucet, and the faucet includes various flow controlling parts which vary in number and configuration. Thus, a beer line of known diameter, say for example 3/16 inch diameter, and of known length, say for example 18 feet, has a volume of 3 ounces of liquid; and in practice such lines can be up to ½ inch diameter with volume varied accordingly. In any case, the volume of such a line is readily determinable in order to arrive at the desired ratio of rinse liquid to be flushed through said line.

Faucets are most vulnerable to the build-up of yeast or "beer stone," and the ordinary flushing methods whereby cleaning fluid is pumped back and forth therethrough are not altogether satisfactory. That is, the internal workings of such faucets are intricate and defy the complete removal of the build-up. However, for sanitary purposes these valves or faucets are readily dismantled for cleaning, and which is a necessity in the prevention of off-taste beer.

The flushing which characterizes the cleaning of beer lines includes the use of chemical cleaners in liquid form that are admixed with a quantity of clean water and forced through the beer line and faucets. Heretofore, the concentration of these chemicals has been a matter of guess work with no assurance that a proper concentration has been used.

It is to these ends that it is a general object of this invention to provide faucet and line cleaning apparatus for the purpose referred to that flushes the line and washes all faucet parts on the basis of a ratio of flushing liquid to line volume, while admixing thereto a measured amount of chemical cleaner for a determinable flush liquid concentration; and all to the end that the process of line and faucet cleaning is effectively executed with assurance in each instance.

FIELD OF INVENTION

Hydraulic lines and valves, such as those used in dispensing beer, are required to be cleaned from time to time; and to do so they are disconnected from their usual source of fluid pressure and reconnected to flushing liquid under pressure. Pressure can be applied in various ways, as by pumps or pressured fluid displacement, and a flushing liquid forced under pressure through the line and open valve to be cleaned. The flushing liquid is activated by admixing a chemical cleaner therewith, and a rinsing liquid of clean water follows; and all of which involves guess work with the prior art concepts which involve batch mixing of the chemical cleaner, not necessarily admixed to the optimum concentration for each installation to be cleaned. Therefore, it is an object of this invention to provide means whereby an optimum chemical to water admixture is obtainable for each installation to be cleaned. With the present invention a chemical cleaner is stored in the apparatus and selectively useable for each installation processed, as circumstances require.

It is also an object of this invention to provide mixing means for the initial application of a most concentrated chemical-water flushing liquid, followed by a progressive weakening thereof and by the eventual application of clean rinse water; and all without resort to valve controls and the like which characterize the prior art apparatus.

It is another object of this invention to provide canister means for the containment of the internal working parts of the faucet valve which is to be cleaned, and from which air is displaced and whereby the faucet and parts and line to be cleaned are held under pressure and subject to soaking in the chemical-water admixture for a time period sufficient to clean the same, as required.

It is still another object of this invention to provide a cleaning apparatus of the character above referred to that is sanitary in every respect. The fluid connections used are complementary to those used in the system cleaned, and they are connectable therewith. And, the apparatus fixtures are embodied in transparent materials by means of which the stages of the cleaning processes are observed. With the present invention, the quantity of the chemical used is observedly measurable prior to each cleaning application, and the condition of the faucet parts can be observed while the process is in operation.

SUMMARY OF INVENTION

This faucet and line cleaning apparatus involves the pressure application of a measured amount of liquid chemical admixed to water and to which the line and faucet to be cleaned are subjected for a period of time, and this to be followed by rinsing with clean water. The apparatus is embodied in a combination of correlated fixtures including, generally, a pressured water supply means A, an admixing means B with a chemical supply means C therefor, a connection means D for charging liquid into the line to be cleaned, a canister means E for containing faucet parts and the like to be cleaned, a connection means F for mounting the canister means on the discharge end of the line to be cleaned, and control means G for holding and/or discharging liquid through the apparatus.

DRAWINGS

The various objects and features of this invention will be fully understood from the following detailed description of the typical preferred form and application thereof, throughout which description reference is made to the accompanying drawings, in which:

FIG. 1 is a schematic showing a typical installation of the fixtures which comprise the apparatus of the present invention.

FIG. 2 is an enlarged sectional view of the lowermost fixture shown in FIG. 1 which measurably dispenses cleaner into the line to be cleaned.

FIG. 3 is a side view taken as indicated by line 3—3 in FIG. 2.

FIG. 4 is an enlarged sectional view of the uppermost fixture shown in FIG. 1 which contains the faucet parts to be cleaned.

PREFERRED EMBODIMENT

The basic elements of a beer dispensing system are shown in FIG. 1 of the drawings and which involves a beer line **10** that extends from a beer supply in the form of a keg or barrel **11,** and to a faucet **12.** The beer line **10** is a pipe or tube, preferably a plastic tube, with a coupling **13** normally screw threaded onto the tap valve **14** of the barrel **11,** and with a coupling **15** onto the "bent tube" **16,** or like plumbing which carries the faucet **12.** The coupling **13** is removeable from the tap valve **14** so as to be joined to the connection means D which comprises a male member **17** (see FIG. **2**) that threads into the female member of said coupling **13.** The faucet **12,** the body **18** of which is shown fixed onto the "bent tube" **16** involves internal parts (indicated in FIG. **1**) that are removed and contained within the canister means E during the cleaning operation. The apparatus is shown in condition for cleaning the line **10** and internal parts of faucet **12.**

Referring now to the pressured water supply means A, portability is a requirement for the equipment under consideration, and to this end a pressurized water supply tank **20** is provided. In practice, the quantity of water required is relatively small so that several gallons thereof will suffice. Pressure can be generated in various ways, and a compact and reliable pressure source which can be accurately controlled is the pressurized gas cylinder **21** and regulator **22** with the usual gauges **23** and a control **24** set for 28–30 psi. There is a valve **25** in a line **26** to the tank **20** which is normally closed, and a siphon tube **27** enters the tank and projects into the lower portion thereof to receive water stored therein through a cap or cover **28.** In accordance with this invention, the siphon tube **27** carries the receptacle member **30** of a quick disconnection fluid coupling located at the exterior of the tank and disposed on a vertical axis to receiveably support the fixture of the apparatus which involves the admixing means B and its supply means C, as hereinafter described.

The admixing means B and its supply means C are embodied in a fixture detatchably supported upon the tank **20** of means A by the receptacle member **30,** and to this end the fixture has a complementary male member **31** that is releasably engaged with the aforementioned receptacle member **30.** The said fixture is preferably a body of transparent material with spaced upper and lower chambers **32** and **33** comprising the means C and B formed therein and interconnected as will be described.

Chamber **32** is sizeable, containing fourteen liquid ounces, and is vertically disposed with a removeable cover **34** for filling and cleaning. As shown, a vent valve **35** is manually operable to open the upper end of the chamber **32** to atmosphere.

The chamber **33** is horizontally disposed and underlies the chamber **32,** chamber **33** being substantially elongated with a center inlet **36** from the siphon tube **27** and connected members **30** and **31,** and with a remote outlet **37** at one end thereof in communication with the threaded male fitting M that comprises the connection means D and onto which the coupling **13** is tightened for charging liquid into the beer line **10.** As shown, a removeable plug **38** closes one end of the chamber **33,** whereby cleanout is facilitated.

In accordance with this invention, there is the interconnection of chambers **32** and **33** by means of a manually controllable valve **40,** by which chemical cleaner liquid stored in chamber **32** can be measurably dispensed and allowed to flow by gravity into the chamber **33.** As shown in FIG. **3,** the side walls of the fixture are calibrated at **41** to indicate the volume of liquid dispensed into the chamber **33,** this operation being performed when outlet **37** is opened to atmosphere.

Referring now to the canister means E and its connection means F, these two means and the control means G are embodied in a fixture detatchably supported on the faucet **12** by means of a complementary male member **42** coupled to the faucet **12** by a threaded nut **43.** In any case, the member **42** provides open communication between the interior of the remaining installed portion of faucet **12** and the chamber **44** within the canister E. As shown, the canister E is a cylindrical container of transparent material with a screw-on cap, vented at the top with a manually operable valve **45** that opens to atmosphere, and with a drain valve **46** comprising the control means G open from the bottom of the chamber **44.**

From the foregoing it will be seen that I have provided a relatively simple apparatus of minimized bulk and light weight. A service man utilizing this apparatus will fill the chamber **32** with a chemical cleaner in the form of a liquid such as Caustic Soda or Caustic Potash. It is to be understood that there is a multitude of concentrated chemical preparations suitable for the purpose of cleaning beer lines and valve parts. The cover **34** is applied and the vent valve is closed during transport, the transfer valve **40** being normally closed; the service man now being prepared for a series of service operations involving the cleaning of beer lines and faucet parts.

In order to service a beer dispensing installation of the character referred to, the service man dispenses the required volume of chemical cleaner into the admixing chamber **33** by opening the dispensing valve **40,** and he closes the tap valve **14** and reconnects the coupling **13** to the outlet **37** of connection means D, and he disassembles the faucet **12** and places the interior parts thereof in the chamber **44** of the canister means E. The vent valve **45** is opened and the valve **25** is opened with the pressure regulator **22** and control **24** for the gas cylinders **21** set as hereinabove described. Clean water will then forceably enter the admixing chamber **33** where it turbulently comingles with the chemical cleaner therein and subsequently discharges therewith through the outlet **37.** The discharge of flushing liquid is forced through beer line **10** and into the canister means E where it displaces atmosphere through valve **45** which is closed as and when the chamber **45** is filled with liquid. Thereupon the system and apparatus becomes pressurized and is left to soak for a time interval as may be required of the chemical cleaner employed. Thereafter the control valve **46** of the means G is opened and which permits the continued flow of clean rinse water to displace the chemicalized flush liquid from the system. The service man then reassembles the faucet **12** and reconnects to and opens the valve **14,** which places the beer dispensing system back into operation.

Having described only a typical preferred form and application of my invention, I do not wish to be limited or restricted to the specific details herein set forth, but wish to reserve to myself any modifications or variations that may appear to those skilled in the art:

I claim:

1. A hydraulic line cleaning apparatus including; a pressured liquid supply means, a valve controlled connection from the liquid supply means and into said hydraulic line, and an admixing means in said connection and with a supply means of liquid cleaner therefor, there being a dispensing valve from the last mentioned supply means and in a passage controlling the flow of liquid cleaner into the admixing means.

2. The line cleaning apparatus as set forth in claim 1, wherein the admixing means is a chamber adapted to receive said liquid cleaner and through which the valve controlled connection charges pressurized liquid to be comingled with liquid cleaner and passed into said hydraulic line.

3. The line cleaning apparatus as set forth in claim 1, wherein the admixing means is an elongated chamber adapted to receive said liquid cleaner and into which the valve controlled connection discharges said pressurized liquid intermediate the ends of said admixing chamber to be comingled with liquid cleaner therein and passed into said hydraulic line.

4. The line cleaning apparatus as set forth in claim 1 wherein the admixing means is a chamber that underlies the supply means in the form of a chamber holding liquid cleaner in reserve therefor.

5. The line cleaning apparatus as set forth in claim 1, wherein the admixing means is a chamber that underlies the supply means in the form of a chamber holding liquid cleaner in reserve therefor, and wherein the said dispensing valve and passage extend between said two chambers for gravity flow.

6. The line cleaning apparatus as set forth in claim 1, wherein the admixing means is a chamber that underlies the supply means in the form of a chamber holding liquid cleaner in reserve therefor, and wherein the said dispensing valve and passage extend between said two chambers for gravity flow, said dispensing valve being normally closed and there being a normally closed vent valve from the supply means chamber, whereby stored liquid cleaner gravitates when the latter valve is opened.

7. The line cleaning apparatus as set forth in claim 1, wherein the admixing means is a chamber with indicator means showing the level of liquid cleaner dispensed therein.

8. The line cleaning apparatus as set forth in claim 1, wherein the admixing means and supply means therefor are embodied in transparent material for hygenic visibility.

9. The line cleaning apparatus as set forth in claim 1, wherein the admixing means and supply means therefor are embodied in transparent material with indications thereon showing the level of liquid content in the said supply means.

10. A hydraulic line and faucet cleaning apparatus wherein the said faucet is disassembled to expose the internal working parts thereof, and including; a pressurized liquid supply means, a valve controlled connection from the liquid supply means and adapted to be coupled to the inlet end of said hydraulic line, and a canister means adapted to be coupled to the outlet end of said hydraulic line and into a chamber therein with a removeable closure therefor and adapted to receive and contain said internal working parts of the faucet, there being a valve means opening from the chamber to discharge fluid therefrom.

11. The hydraulic line and faucet cleaning apparatus as set forth in claim 10, wherein the last mentioned valve means vents the upper portion of said canister chamber to atmosphere.

12. The hydraulic line and faucet cleaning apparatus as set forth in claim 10, wherein the last mentioned valve means opens from the lower portion of said canister chamber to discharge liquid therefrom.

13. The hydraulic line and faucet cleaning apparatus as set forth in claim 10, wherein the last mentioned valve means comprises a valve venting the upper portion of said canister chamber to atmosphere and valve means opening from the lower portion of said canister chamber to discharge liquid therefrom.

14. The hydraulic line and faucet cleaning apparatus as set forth in claim 10, wherein the said disassembled valve comprises the outlet end of said hydraulic line and wherein connection means couples the canister means thereto.

15. A hydraulic line and faucet cleaning apparatus wherein the said line and said faucet are disconnected and disassembled to expose the internal workings thereof to an admixed liquid cleaner, and including; a pressurized liquid supply means, a valve controlled connection from the liquid supply means and adapted to be coupled to the inlet end of said hydraulic line, an admixing means in said connection and with a supply means of liquid cleaner therefor, there being a dispensing valve from the last mentioned supply means and in a passage controlling the flow of liquid cleaner into the admixing means, and a canister means adapted to be coupled to the outlet end of said hydraulic line and into a chamber therein with a removeable closure therefor and adapted to receive and contain the said internal working parts of the faucet, there being a valve means opening from the chamber to discharge fluid therefrom.

16. The line and faucet cleaning apparatus as set forth in claim 15, wherein the admixing means is a chamber that underlies the supply means in the form of a chamber holding liquid cleaner in reserve therefor.

17. The line and faucet cleaning apparatus as set forth in claim 15, wherein the admixing means is a chamber that underlies the supply means in the form of a chamber holding liquid cleaner in reserve therefor, and wherein the said dispensing valve and passage extend between said two chambers for gravity flow.

18. The line and faucet cleaning apparatus as set forth in claim 15, wherein the admixing means is a chamber that underlies the supply means in the form of a chamber holding liquid cleaner in reserve therefor, and wherein the said dispensing valve and passage extend between said two chambers for gravity flow, said dispensing valve being normally closed and there being a normally closed vent valve from the supply means chamber, whereby stored liquid cleaner gravitates when the latter valve is opened.

19. The line and faucet cleaning apparatus as set forth in claim 15, wherein the last mentioned valve means vents the upper portion of said canister chamber to atmosphere.

20. The line and faucet cleaning apparatus as set forth in claim 15, wherein the last mentioned valve means opens from the lower portion of said canister chamber to discharge liquid therefrom.

21. The line and faucet cleaning apparatus as set forth in claim 15, wherein the said disassembled valve

comprises the outlet end of said hydraulic line and wherein connection means couples the canister means thereto.

22. The line and faucet cleaning apparatus as set forth in claim **15,** wherein the admixing means is a chamber that underlies the supply means in the form of a chamber holding liquid cleaner in reserve therefor, wherein the said dispensing valve and passage extend between said two chambers for gravity flow, and wherein the valve means opening from the canister chamber comprises a valve venting the upper portion of said canister chamber to atmosphere and a valve opening from the lower portion of said canister chamber to discharge liquid therefrom.

23. The line and faucet cleaning apparatus as set forth in claim **15,** wherein the admixing means is a chamber that underlies the supply means in the form of a chamber holding liquid cleaner in reserve therefor, wherein the said dispensing valve and passage extend between said two chambers for gravity flow, said dispensing valve being normally closed and there being a normally closed vent valve from the supply means chamber, whereby stored liquid cleaner gravitates when the latter valve is opened, and wherein the valve means opening from the canister chamber comprises a valve venting the upper portion of said canister chamber to atmosphere and a valve opening from the lower portion of said canister chamber to discharge liquid therefrom.

* * * * *