March 1, 1938. G. R. ANDERSON ET AL 2,109,896

DISPENSING SYSTEM

Filed Oct. 2, 1936 2 Sheets-Sheet 1

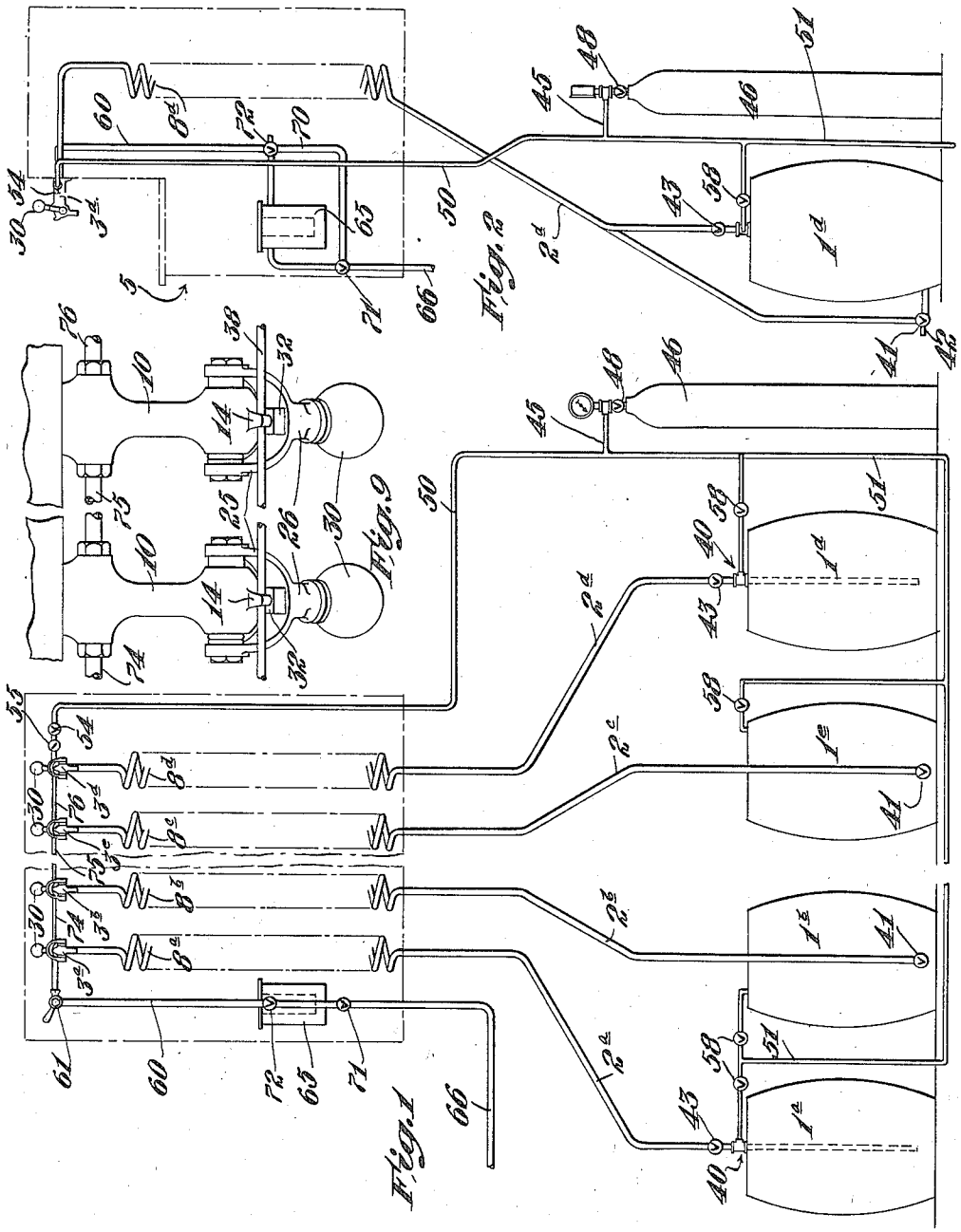


Fig. 2



Fig. 3



Fig. 1

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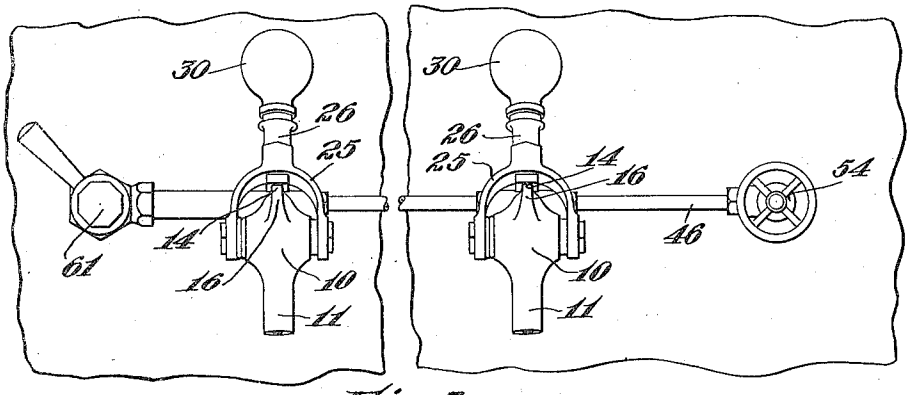



Fig. 3

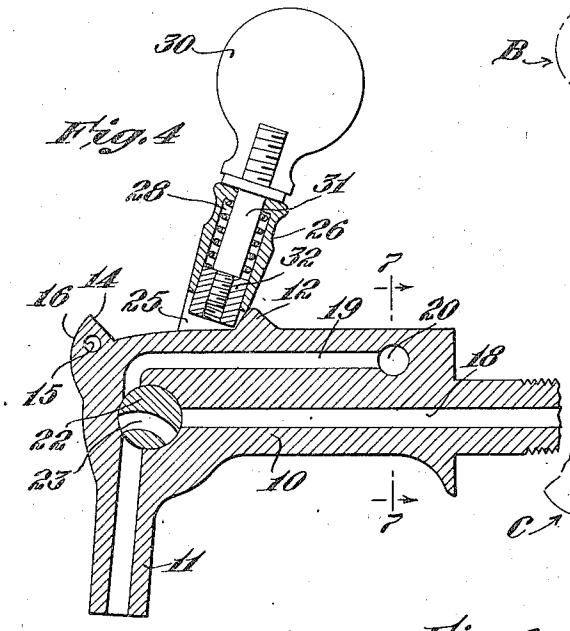



Fig. 4

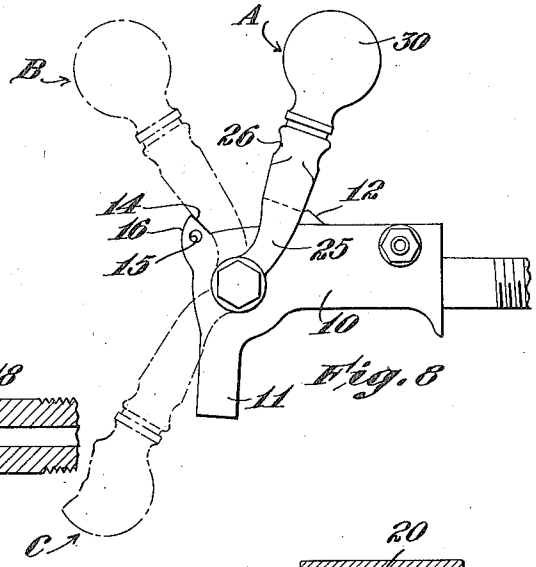



Fig. 8

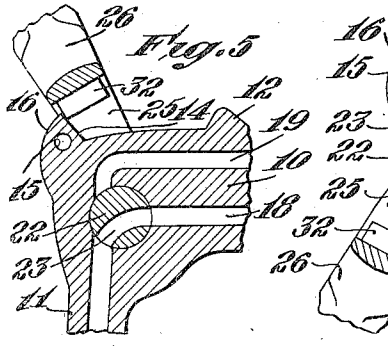



Fig. 5

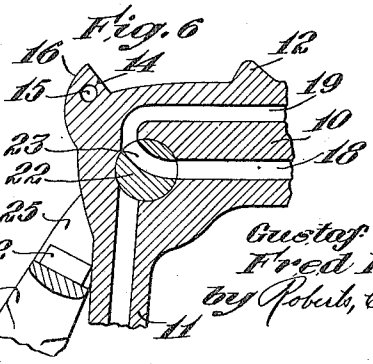



Fig. 6

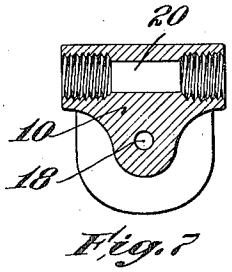



Fig. 7

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# UNITED STATES PATENT OFFICE

2,109,896

## DISPENSING SYSTEM

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Application October 2, 1936, Serial No. 103,626

8 Claims. (Cl. 225—12)

This invention relates to a fluid dispensing system and more particularly to a system for dispensing beverages such as beer, ale, carbonated drinks, etc.

In such systems the liquid to be dispensed is usually drawn from a supply reservoir and forced through the distributing conduits, either by gravity or by pressure, to the dispensing points, and in distributing liquids of a relatively unstable or chemically reactive character, great care must be exercised to prevent deterioration of the liquid and fouling of the system. In dispensing such liquids as beer, carbonated drinks, coffee, milk, and the like beverages which are apt to deteriorate on standing or remaining in contact with metallic surfaces, it is necessary to drain and thoroughly flush the distributing lines periodically in order to insure dispensing a wholesome beverage and prevent the deposition of extraneous matter and the formation of slime, sludges, etc. which are apt to foul the distributing lines. For example, in systems for dispensing beer, ale and fermented beverages in general, it is absolutely necessary periodically to clean out or flush the distributing lines in order to prevent the formation or precipitation of yeast sludges or "beer stone" and also to drain such beverages from the distributing lines and cooling coils before closing the system down, so that during the periods when the system is not in use the beverage is not permitted to remain in contact with the metallic surfaces of the distributing pipes and cooling coils. As fermented beverages and carbonated drinks must always be kept under pressure so that they will not lose their charge and become "dead" or flat tasting, the beverage drained or expelled from the distributing pipes and cooling coils can not be salvaged and is usually thrown away. This loss of beverage, as well as the time consumed and difficulty involved in cleaning out the distributing system, represents, in the aggregate, a considerable sum of money and adds appreciably to the cost of dispensing beverages.

Although various arrangements have been proposed to clean out such systems, such arrangements usually necessitate the use of expensive equipment, the disconnecting of different parts of the system so as to couple them to the flushing lines, or a complete shutting down of the entire system during the cleaning operation, and usually the services of two or more attendants are necessary.

The principal objects of the present invention are to overcome the aforementioned objectionable features inherent in prior systems and to provide a system wherein the individual units or lines may be cleaned out, etc., without affecting the remaining units or lines; and to provide a system wherein the fluid to be dispensed may be drawn from its reservoir or point of supply and wherein the fluid remaining in the lines may be returned to its reservoir, and the distributing line completely cleared thereof so that a cleaning fluid, for example, may be conducted through and discharged from the system, or any part thereof, by a simple manipulation of the controls.

More specific objects are to provide a distributing system suitable for dispensing beverages such as beer, ale and the like fermented liquors, wherein the beverage remaining in the system may be quickly returned to the source of supply without loss and without altering conditions under which the beverage must be kept in order to prevent deterioration or otherwise impairing its quality; to provide means for flushing out and/or cleaning the system; to provide a system having controls located at a convenient place and which may be operated so as to effect the performance of the aforesaid operations quickly and efficiently; and to provide a system wherein the control for the dispensing line is operative to control the flow from the pressure and flushing lines.

Further objects and advantages will be apparent as attributes of the construction and operation of our improved system, and as illustrative of its utility is herein shown and described in connection with a system particularly suitable for dispensing beer and the like beverages.

In accordance with the present invention the supply reservoir, which may be a tank, barrel or the like container of suitable size and shape, is connected to the distributing point or tap by a pipe line which may, if desired, include heating or cooling coils or the like. Although the reservoir may be disposed at an elevation, relative to the dispensing point, which permits a flow through the distributing line or lines by gravity, we preferably employ a gaseous pressure such as compressed air, carbon dioxide or the like to force the liquid or beverage from the supply reservoir to the distributing point or points, particularly where the liquid to be dispensed is a fermented liquor, carbonated beverage or the like which must be kept under pressure in order to maintain its "charge" or "life". To this end the supply reservoir may be connected to a pressure line and suitable means may be employed to maintain a substantially constant predetermined pressure within the reservoir sufficient not only

to force the liquid from the reservoir to the distributing point, but also to prevent the beverage from losing its charge.

In order to return any liquid or beverage remaining in the distributing line back to the supply reservoir and/or clear the distributing line of any liquid therein, a pressure line may be connected to the distributing line at a point closely adjacent to its delivery end or spout,—a check valve or the like being provided so as to prevent any liquid from entering the pressure line, and suitable means may be provided to maintain and control the pressure so as to effect a return flow through the distributing line. Means are also provided for flushing or cleaning the distributing line, and to this end the distributing line is connected to a flushing or cleaning line at a point closely adjacent to the control for the latter, so that the control means may also be operated to control the flow from the flushing line through the dispensing line. As the pressure and flushing lines are connected to the distributing line closely adjacent to the delivery point and are controlled by the manipulation of the closely grouped control elements, a single operator may from one position clear and thoroughly flush the entire system by a simple manipulation of one or two valves.

In the accompanying drawings:

Fig. 1 is a front elevation of a complete system constructed in accordance with the present invention;

Fig. 2 is a side elevation of the system shown in Fig. 1;

Fig. 3 is a fragmentary front elevation of the taps and associated parts;

Fig. 4 is an enlarged longitudinal section through a tap constructed in accordance with the present invention;

Fig. 5 is a fragmentary section of the tap, showing the dispensing line open;

Fig. 6 is a view similar to Fig. 5 but showing the dispensing line connected with the flushing line so as to permit the return of the beverage therein;

Fig. 7 is a section on the line 7—7 of Fig. 4;

Fig. 8 is a side elevation of a tap, showing the control element in its three different positions; and

Fig. 9 is a fragmentary top plan view showing the operating levers of the taps locked in inoperative position.

Referring to Figs. 1 and 2, a plurality of supply reservoirs, here shown as barrels or kegs $1^a$, $1^b$, $1^c$, $1^d$, etc., are respectively connected by dispensing lines $2^a$, $2^b$, $2^c$, $2^d$, etc., to a number of faucets or taps $3^a$, $3^b$, $3^c$, $3^d$, etc., preferably disposed in alignment and located at a conventional counter or bar 5 which is disposed at a higher level than the barrels. The bar or counter may be provided with the usual coolers through which pass the coils $8^a$, $8^b$, $8^c$, $8^d$, etc., forming part of the distributing lines. Although four barrels, taps, etc., are here shown by way of illustration, it is to be understood that a greater or lesser number may be used.

Referring to Figs. 4 to 8, each faucet consists of a single fixture having a body portion 10, the end of which terminates in a depending spout 11 and the upper surface of which is formed with an inner stop 12 spaced from an outer stop 14 formed with an opening 15. The outer surface of the stop 14 is shaped to provide a cam-like element 16, the utility of which is hereinafter pointed out. The body of the faucet is formed or otherwise provided with a longitudinally extending delivery duct 18 and a similarly disposed second duct 19 (hereinafter referred to as the pressure duct), the latter being spaced from the first and having its inner end communicating with a transversely extending intake chamber 20 (Figs. 4 and 7) whose opposite ends are formed with screw-threaded openings or other suitable means providing a connection. The duct 18, the bore of the spout 11, and the passage therebetween is preferably of the order of $\frac{3}{16}$ of an inch, as compared with a diameter of the order of $\frac{3}{8}$ of an inch for the delivery lines. The restricted diameter of the duct 18, spout 11, etc., is effective to increase the resistance of flow therethrough and ensure a creamy, closely knitted "head" on the beverage delivered from the spout. The outer ends of ducts 18 and 19 and the upper end of the spout converge about the periphery of the valve seat so that their respective centers are preferably spaced at an angle of approximately 120° from each other.

A valve member 22 is rotatably mounted on the valve seat, the valve member 22 having an arcuate passage 23 which is so constructed and arranged that rotation from the normally closed position A, wherein the ducts and spout are disconnected from each other as shown in Figs. 4 and 8, through an angle of approximately 45°, brings the valve member to normal open position B wherein the spout 11 and delivery duct 18 are connected with each other, as shown in Fig. 5, and a further rotation through an angle of approximately 120° from position B brings the valve member to position C, wherein the delivery duct is connected with the pressure duct, but closed off from the spout, as shown in Fig. 6.

The ends of the valve member 22 are secured to the ends of a yoke 25 which straddles or surrounds the upper part of the body portion 10, as shown in Figs. 3 and 9, this yoke forming a part of an operating lever 26 which is provided with a longitudinally extending bore 28, as shown in Fig. 4. An operating handle 30 is connected to the upper end of a rod 31 which carries a spring-pressed plunger 32, the handle, rod and plunger being slidable as a unit longitudinally of the bore 28 and being normally held by the compression spring 34 so that the plunger 32 is in stop-engaging position when the lever is swung within its normal operating range, that is, from position A to position B and back to position A.

When the handle 30 is pulled outwardly, the plunger 32 is retracted so as to permit the lever to be swung from its normal operating range to position C, and when in the latter position, the lever may be swung back to its normal operating range without retracting the plunger, since the cam-like surface 16 of the stop 14 engages the plunger and causes it to ride over and retract. After passing the tip of the stop 14, the spring 34 forces the plunger back to stop-engaging position, as shown in Fig. 5. When the lever 26 is swung downwardly beyond the stop 14, a locking element, such as a rod 38 (Fig. 9), or the arm of a padlock, may be inserted through the opening 15 of the stop 14 so as to prevent the lever from being swung from position C back to its normal operating range.

Referring to Figs. 1 and 2, the delivery ends of the distributing lines $2^a$ to $2^d$ are connected with the delivery ducts 18 of the respective faucets, and the opposite ends of the distributing lines are connected with the barrels $1^a$ to $1^d$, respectively. As here shown by way of illustration, the dis-

tributing lines 2a and 2d are connected to the barrels 1a and 1d, respectively, by a so-called "Peerless" or New York type bung connection, indicated by the numeral 40, whereas the barrels 1b and 1c, are connected with the distributing lines 2b and 2c, respectively, by a so-called "Golden Gate" bung connection, as indicated by the numeral 41. If desired, these latter bungs may be provided with a two-way valve which controls the flow through the distributing lines, and also a drain nipple 42, shown in Fig. 2. The distributing lines having a "Peerless" type connection with the valves are preferably provided with an ordinary shut-off valve 43 for emergency use.

A pressure line 45 is connected to a suitable source of gaseous pressure, here shown as a carbon dioxide tank 46 furnished with a pressure regulator or reducing valve 48 which is operative to maintain a substantially constant pressure in the line 45 and its branches 50 and 51. The branch 50 is connected to one end of the intake chamber 20 of the faucet 3d (the last faucet of the series) by a connection which includes a shut-off valve 54 (Fig. 3) and a check valve 55, indicated in Fig. 1. The branch 51 is connected with each of the barrels 1a, 1b, 1c, 1d, the connection with the barrels 1a and 1d being through the "Peerless" type bung and the connection with barrels 1b and 1c being through orifices in their respective heads, as shown in Fig. 1. Each of the lines leading from the branch 51 is provided with a shut-off valve 58 so that any of the barrels may be disconnected from the pressure line without interfering with the operation of the system.

One end of a flushing line 60 is connected with the intake chamber 20 of the faucet 3a (the first of the series) and adjacent to its connection there is provided a spring-operated normally closed shut-off valve 61 (Figs. 1 and 3) or other suitable shut-off. The other end of the flushing line is connected at some convenient point with a flushing tank 65 which is connected with a line 66 to a water main (not shown). The flushing tank is preferably disposed beneath the counter or bar 5 so as to be readily accessible, and this tank is provided with a removable cover so that a cleaning solution, cartridge or other type of cleaning compound may be disposed therein when it is desired to clean out the distributing lines. If desired, a by-pass 70, controlled by a valve 71, may be provided so that the water may pass from the line 66 to the flushing line 60 without passing through the tank 65.

As previously pointed out, the faucets 3a to 3d are preferably disposed in alignment so that their respective intake chambers 20 and the openings 15 in their respective stops are in registry with each other, and the flushing and pressure lines are connected with the outside intake openings in the faucets 3a and 3d, respectively. The intake opening on the inner side of the faucet 3a is connected by a pipe line 74 to the adjacent intake opening in the faucet 3b, and in like manner pipe lines 75, 76, etc. connect the adjacent intake chambers with each other so that there is a continuous open line between the check valve 65 and shut-off valve 61, thus providing a direct communication between each of the series of faucets and the pressure and flushing lines.

The operation of the system is as follows: Assuming that the barrels 1a to 1d are at least partially filled with beer or other beverage to be dispensed, that the faucets 3a to 3d are in closed position (A), that the pressure regulator 48 is set to maintain a pressure of from 12 to 60 lbs. per square inch in the lines 50, 51, etc., that the valves 41, 43, 54 and 58 are all open and the valve 61 is in normally closed position, that the valve 71 is positioned to cut in the by-pass 70, and that the water in lines 60 and 66 is at a pressure substantially greater than that in the lines 50 and 51,—then under these conditions beer is forced through the distributing lines to the dispensing point as soon as the operating levers of the faucets are swung forwardly to position B (Fig. 5) and the system is thus ready for normal operation. Under these conditions, the beer in the system is maintained under a pressure of from 12 to 60 lbs. per square inch, which prevents the escape of gas carried thereby and thus insures the dispensing of a wholesome salable product.

To close down any one of the units, it is merely necessary to swing the operating lever of the faucets of that unit downwardly to position C (Fig. 6), thereby connecting the delivery duct 18 and pressure duct 19 and causing a reverse flow of the beer in that particular unit back into the barrel under the action of gravity, it being noted that the pressure on each side of the distributing line has become equalized when the pressure and delivery ducts were connected. By manipulating all faucets in this manner, the entire system may be closed down and the beer in the distributing lines returned to the barrels where it is maintained under sufficient pressure to prevent the escape of gas or deterioration.

When the entire system is shut down, as above described, it may be locked so that none of the faucets can be swung back to normal operating position, and to this end a rod 80 (Fig. 8) may be inserted through the openings 15 in each faucet and locked in place by any suitable means. In a similar manner any of the individual units may be locked in position C without interfering with the operation of the other faucets.

To reopen any of the units, or the entire system, it is merely necessary for the operator to remove the locking element if such has been used, and swing the operating levers from position C back to position A, thus disconnecting the ducts 18 and 19 in each of the faucets and restoring the operating levers to their normal operating range so that when swung forwardly to position B the beer is forced through the distributing lines to the faucets for dispensing in the usual manner.

If, for example, one of the barrels becomes empty and it is desired to flush out the distributing line leading thereto, the barrel or pressure line associated therewith may be disconnected, or the valve 58 closed and the bung connection loosened, and the operating lever of that particular unit may be swung to position C, whereupon the operator turns on the valve 61. As the pressure in the water line is greater than that in the pressure line 50, there is a flow of water from the lines 66 to 60, through the intake chamber 20 and duct 19 of the unit being flushed, and back through the distributing line to the empty barrel or into a drain. When the operator removes his hand from the valve 61, it automatically closes and the pressure in line 50 then becomes effective to discharge the water from the distributing line, and with the drain valve 72 temporarily open, all water may be quickly blown from the lines 74, 75, 76 by opening the valve 61. A fresh barrel may then be connected and the unit re-opened as above described. In this manner any one or more of the individual units may be disconnected or flushed

without affecting the operation of the remaining units.

In case it is desired to give one or all of the units a thorough flushing, the bung connections may be removed from the barrels, or the drain nipples 42 cut in, and with the operating levers in position C, the valve 61 may be opened for a period sufficient thoroughly to flush all distributing lines, after which the valve 61 may be permitted to close so that the pressure line 50 comes into operation to discharge all water therein. The operating levers may then be swung back to position A and the bungs re-connected so as to restore normal operating conditions.

If it is desired to clean out the system with a chemical solution, as is required by many State and municipal regulations, a chemical solution, salt or cartridge may be placed in the tank 65 and with the barrels disconnected from the distributing lines, the valve 71 positioned to cut out the by-pass and the operating levers swung to position C, the valve 61 may then be opened to permit cleaning solution to pass from the tank 65 through the entire system. By permitting the valve 61 to close, the cleaning solution may remain in the lines for any desired period, after which the valve 61 may again be opened to permit more solution to pass from the tank 65 until its contents have become exhausted, or, if desired, the valve 71 may be operated to cut in the by-pass so as to permit washing out the system with water. After having been subjected to sufficient cleaning, the normal operation of the system, or any of its units, may be restored as above described.

It is apparent from the foregoing that in the system constructed in accordance with the present invention the individual units may be shut down, the beer or other beverage returned to the system and normal operating conditions resumed by a simple manipulation of a single operating lever and without interfering with the operation of any of the other units. Furthermore, any unit, or group of units, as well as the entire system, may be thoroughly flushed and cleaned by the operation of a few closely grouped controls which may be quickly operated by a single attendant. It should be further noted that in the present system the closing down and re-opening of the entire system is at the very most only a matter of a few seconds, and that when the system is closed down, any individual faucet or the entire series of faucets may be locked to avoid unauthorized use thereof.

Moreover, the present system permits dispensing different types and grades of beverages, as well as replenishing the several units after they become exhausted without interfering with the operation of the remaining units. It will also be noted that a failure of any of the individual units properly to function does not impair the operation of the remaining units, and any such unit may be thrown out of operation and the necessary repairs made.

While we have shown and described one desirable embodiment of the invention, it is to be understood that this disclosure is for the purpose of illustration, and that various changes in shape, proportion and arrangement of parts, as well as the substitution of elements for those herein shown and described, may be made without departing from the spirit and scope of the invention as set forth in the appended claims.

We claim:

1. A dispensing system of the class described, comprising a supply reservoir, a dispensing line connected with said supply reservoir, a valve-controlled pressure line, a valve controlled flushing line, and a faucet which includes a delivery duct connected to the end of said dispensing line, a second duct having a connection with the pressure and flushing lines and valve means operative to open and close the delivery duct and to connect said second duct with said delivery duct so as to permit a reverse flow through said dispensing line when either the pressure line or the flushing line is open.

2. A dispensing system for beverages and the like, comprising a supply reservoir, a dispensing line connected to said reservoir, a flushing line, and a faucet which includes a delivery duct connected to the end of said dispensing line, a flushing duct having a connection with said flushing line, and valve means operative to open and close the delivery duct and to connect the flushing duct with said delivery duct so as to permit a return flow through said dispensing line.

3. A dispensing system for beverages and the like, comprising a supply reservoir, a dispensing line connected to said reservoir, a pressure line having two branches, one branch being connected with said reservoir, a flushing line, and a faucet disposed above the level of said reservoir, said faucet having a delivery duct connected to the end of said dispensing line, a second duct having a joint connection with said flushing line and the other of said branches of said pressure line, and valve means operative to open and close the delivery duct and to connect the second duct with said delivery duct so as to permit a return flow through said dispensing line when either the pressure line or flushing line is open.

4. A beverage dispensing system comprising a plurality of reservoirs, a dispensing line for each reservoir, a pressure line connected to each reservoir, a flushing line, and a plurality of faucets, each faucet having a delivery duct connected to one of the dispensing lines, a second duct which communicates at one end with an intake chamber and a valve operative to open and close said delivery duct and to connect said second duct with said delivery duct, and valve controlled connections between said flushing line and the intake chamber in the first of the series of faucets, a valve-controlled connection between said pressure line and the intake chamber in the last of the series of faucets, and means connecting each intake chamber with the next adjacent intake chamber in said series.

5. In a system of the class described, a plurality of aligned faucets each having a projecting stop formed with an opening in alignment with similar openings in the corresponding stops of the other faucets, a valve member controlling the flow through said faucet, a hand-operated valve control lever normally adapted to swing toward and away from said stop so as to open and close said faucet, said lever being capable of being swung beyond said stop to an inoperative position so that a rod extending through the openings in the stops is effective to lock any lever which has been swung to inoperative position.

6. A faucet comprising a body portion having at one end a depending spout and on its upper surface spaced projecting stops, said body portion having a delivery duct and a pressure duct independent of each other, a rotatable valve between the upper end of said spout and the adjacent ends of the ducts, and a lever connected to said valve and normally arranged to swing between said

stops so as to connect and disconnect said delivery duct and spout, said lever being capable of being swung beyond one of said stops so as to rotate said valve to a position wherein said delivery duct is connected to said pressure duct.

7. A faucet comprising a body portion having at one end a depending spout and on its upper surface an outwardly projecting stop, said body portion having a delivery duct and a rotatable valve for connecting and disconnecting said duct and said spout, a lever connected to said valve and normally operative to swing toward and away from said stop so as to operate said valve, a spring-pressed plunger carried by said lever and engageable with said stop to limit the swinging movement of said lever to its normally operating range, and means for retracting said plunger so that said lever may be swung beyond said stop to an inoperative range wherein said valve disconnects said spout and delivery duct, said plunger being engageable with and capable of riding over the surface of said stop when said lever is swung back to its normal operating range.

8. A faucet comprising a body portion having at one end a depending spout and on its upper surface an outwardly projecting stop, said body portion having a delivery duct and a rotatable valve for connecting and disconnecting said duct and said spout, a lever connected to said valve and normally operative to swing toward and away from said stop so as to operate said valve, a spring-pressed plunger carried by said lever and engageable with said stop to limit the swinging movement of said lever to its normally operating range, and means for retracting said plunger so that said lever may be swung beyond said stop to an inoperative range wherein said valve disconnects said spout and delivery duct, said stop having an opening arranged to receive a locking element effective to prevent said lever from being swung from its inoperative range to its normal operating range.

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