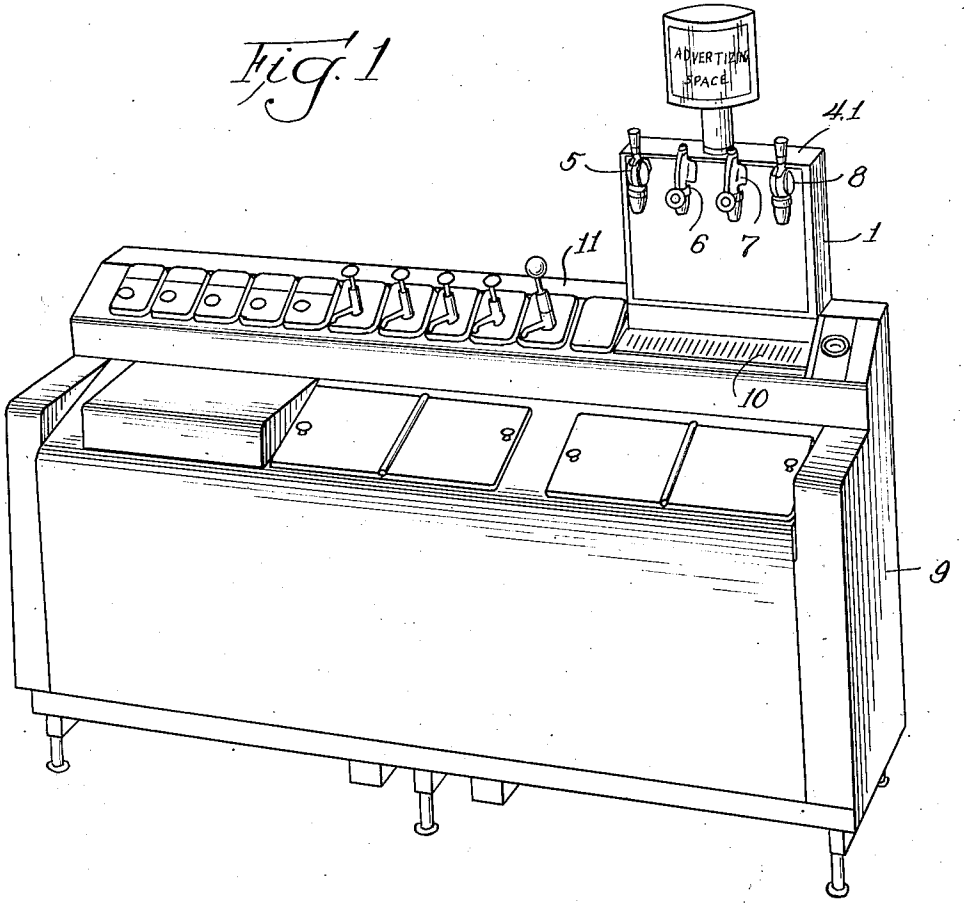
Nov. 26, 1957 H. K. JOHNSON 2,814,184

SODA FOUNTAIN

Filed Aug. 31, 1953 3 Sheets-Sheet 1

Fig. 1



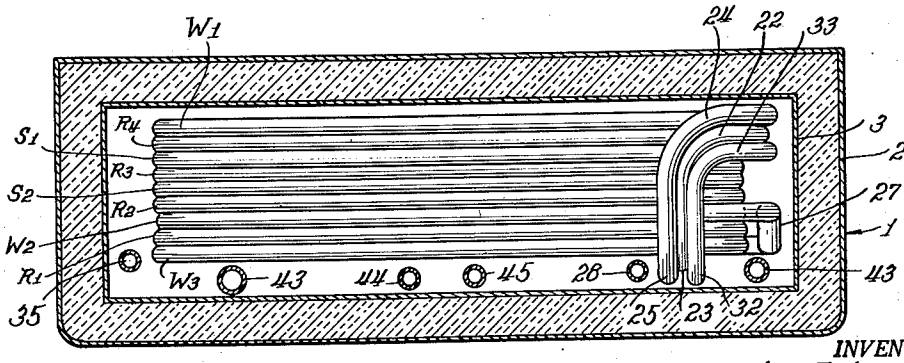


Fig. 4.

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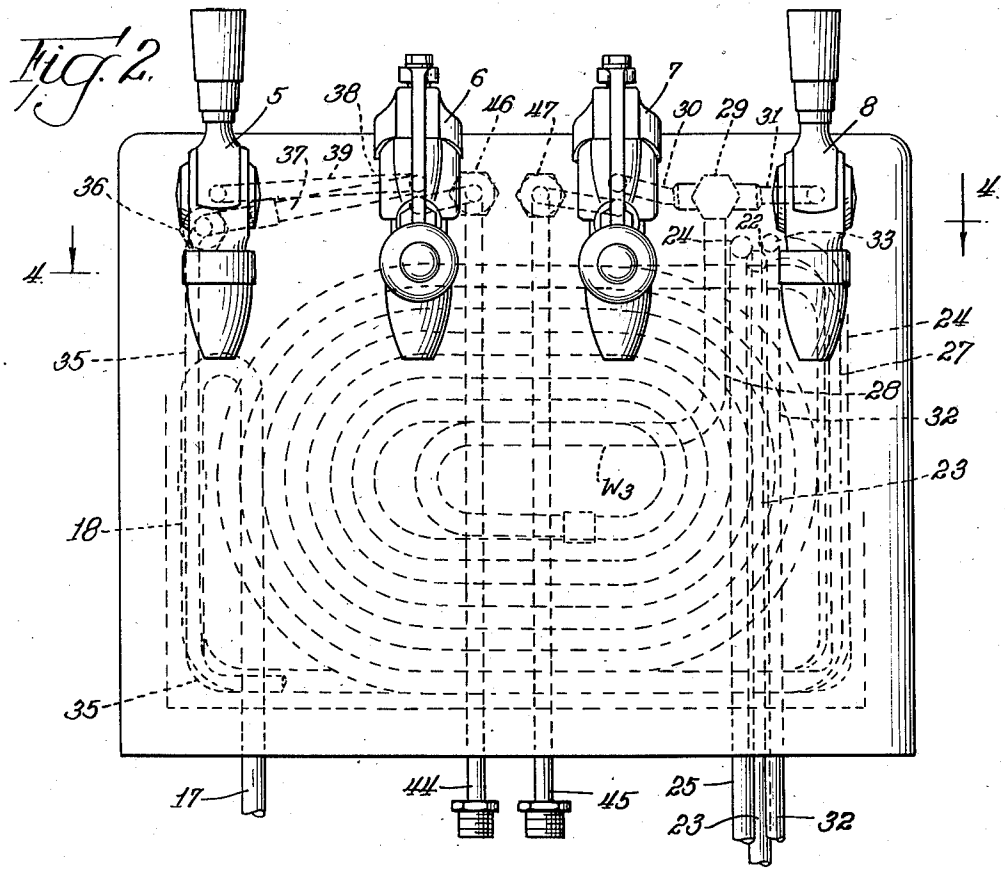
Nov. 26, 1957 H. K. JOHNSON 2,814,184

SODA FOUNTAIN

Filed Aug. 31, 1953 3 Sheets-Sheet 2

Fig. 2.



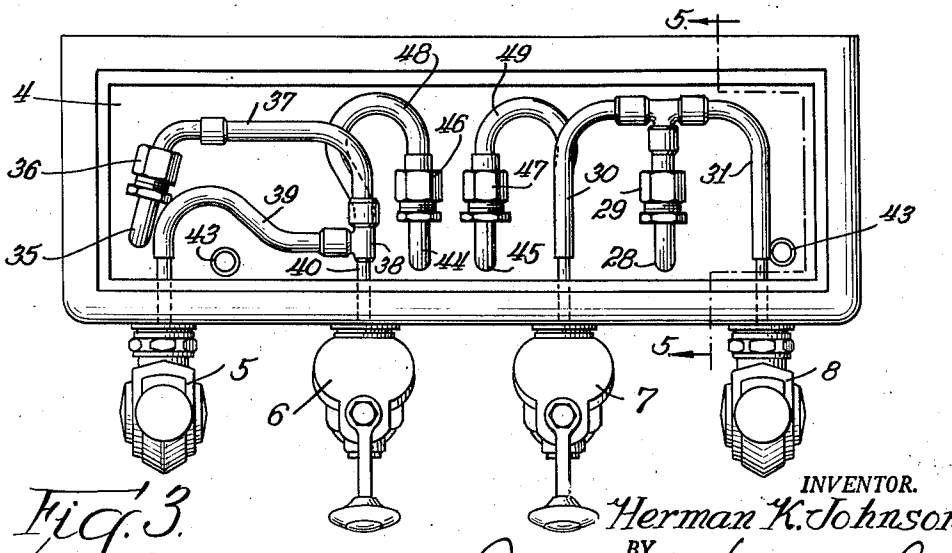


Fig. 3.

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SODA FOUNTAIN

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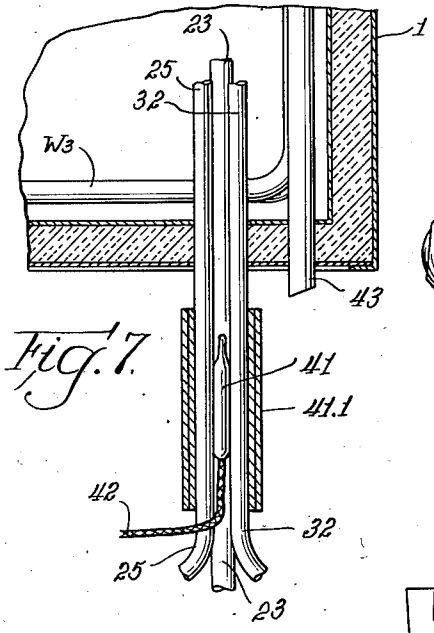

Fig. 7.

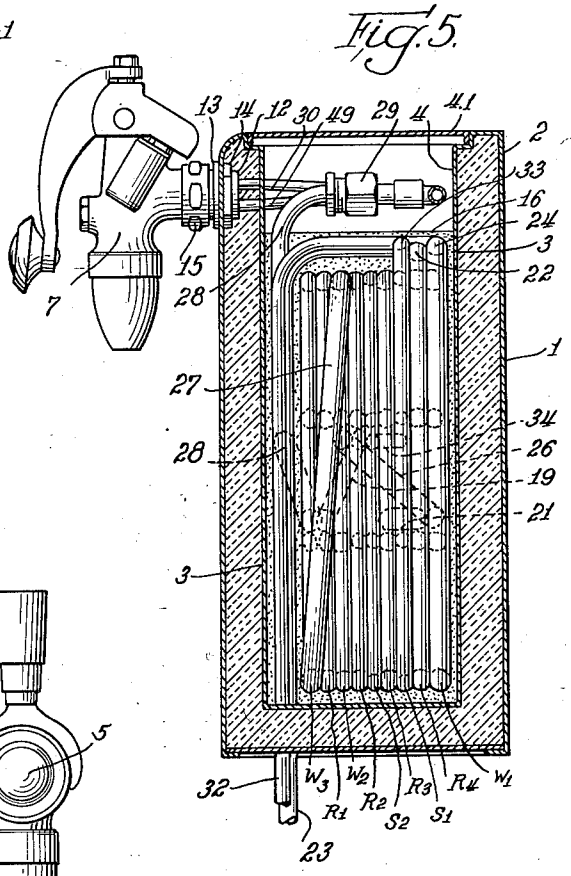

Fig. 5.

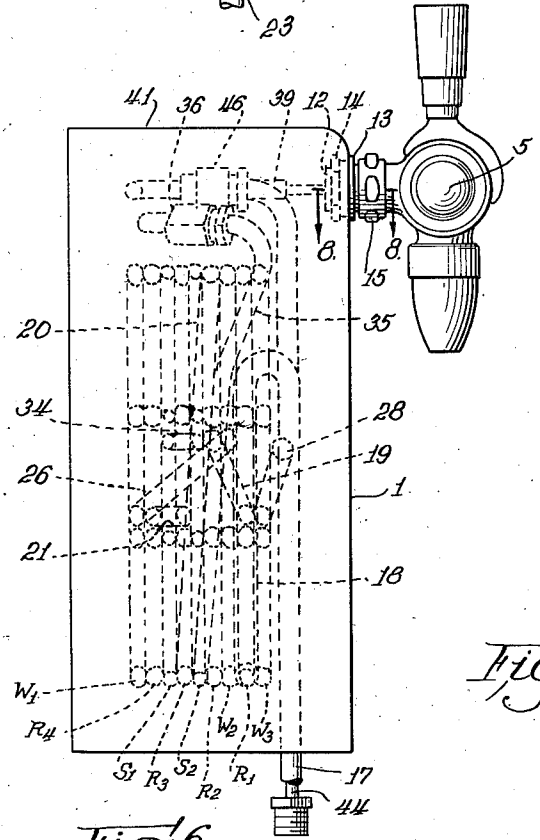

Fig. 6.

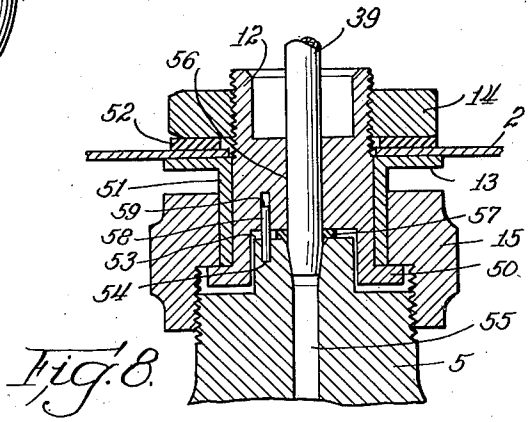

Fig. 8.

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United States Patent Office 2,814,184 Patented Nov. 26, 1957

2,814,184

SODA FOUNTAIN

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Application August 31, 1953, Serial No. 377,433

12 Claims. (Cl. 62—7)

This invention concerns draft arm stations for beverage dispensers and soda fountains and relates particularly to improvements in the construction of draft arm stations and the combination therewith of means for constant and proper refrigeration of the liquids to be dispensed.

In soda fountains and other similar beverage dispensing installations, several draft arms are usually required to handle the different beverages to be served and the draft arms are usually disposed at one convenient location or station where suitable supply connection and drain facilities can be provided. Ordinarily the draft arm station is structurally combined with a cabinet which, beside a counter and other service features, contains refrigerated storage spaces for such goods as bottled beverages and ice cream and the draft arms extend upwardly from the top or counter of the cabinet on individual pedestals, over the drain trough. The cooling coils for the draft arms are usually located in the storage space for the bottled goods, since there the temperature ordinarily will be kept slightly above freezing, and the refrigerating mechanism may either be housed within the cabinet or located at some other place, as may be desired.

However, there are several serious difficulties inherent in such installations, a particular one being excessive cooling of the storage compartment containing the beverage cooling coils, especially when there is a heavy demand or draw on the beverage lines, and a resultant freezing up of the beverage lines when the demand drops or there is a slack period with little or no liquid being drawn. Such freeze-ups require costly service and often costly repairs, and in either event, are apt to cause the beverage dispensing part of the installation to be inoperative at a time when its use is most needed. Also in such installations it is almost impossible to refrigerate the beverage lines or leaders from the cooling coils to the draft heads or faucets, so as to maintain the desired low temperature in the delivered drink, at least for the first several drinks drawn after an idle period and until the liquid in the leaders from the cooling coil to the draft heads has been taken.

The main objects of this invention are to provide an improved beverage draft station having self-contained cooling means; to provide an improved beverage draft station construction; to provide such a device that will have an improved appearance and more convenient operating arrangements; to provide such a device that will be more efficient in its output of properly cooled beverages; to provide such a device having a greater capacity or delivery rate for properly cooled beverages; to provide such a device from which all drinks drawn, including the first, will be properly cooled; and to provide such a device in which the liquid in the leaders to the draft heads or delivery faucets will be kept adequately cooled at all times regardless of the length of any idle period.

Other principal objects of this invention are to provide an improved combination cooler and draft station; to provide an improved arrangement of beverage and refrigerant coils and draft head connection thereto in a unitary draft station construction; to provide such a construction

having relatively short leads from the cooling coils to the draft heads; to provide such a construction in which the cooling coil-to-draft-head leads are also influenced by the cooling effect of the refrigerant coils; to provide such a construction in which accidental freeze-up of the beverage leaders is obviated; and to provide such a construction that is capable of, and may be used for, substantially any cooled beverage dispensing operation.

Further particular objects of the invention are to provide an improved draft station construction which permits a simplified mounting of the draft heads and easy replacement or change of the draft heads; to provide an improved draft station and cooler unit in which the only external beverage leaders are those from the water main to the cooler, and from the water carbonator to the cooler; to provide such a device that, as a unit, can readily be mounted on or removed from a fountain or dispensing cabinet; and to provide such a device that will permit greater utilization of the cabinet storage space and the maintenance of a more uniform temperature therein by eliminating the necessity of housing the beverage cooling coils in the storage compartment.

A specific embodiment of this invention is shown in the accompanying drawings in which:

Fig. 1 is a perspective view of a soda fountain having an improved draft station unit mounted thereon;

Fig. 2 is a front elevation of the improved draft station unit showing the external piping connections and showing, in dotted outline, the principal internal leaders and the disposition of the cooling coils;

Fig. 3 is a top or plan view of the same, with cover removed, showing the connections or leads from the cooler to the draft heads;

Fig. 4 is a sectional plan view of the same, as taken on line 4—4 of Fig. 2, immediately below the plane of the connections shown in Fig. 3, showing the arrangement of the cooler coils, the insulating material normally embedding the coils being omitted;

Fig. 5 is a sectional side elevation of the same, as taken on line 5—5 of Fig. 3, showing an end view of the cooling coil unit and one form of draft head;

Fig. 6 is a side elevation, as taken from the left of Fig. 3, showing the cooling coil in dotted outline and another form of draft head;

Fig. 7 is a fragmentary partly sectioned detail of the cooler unit, taken at the lower right hand corner of Fig. 2, showing the arrangement for mounting the expansion valve control bulb with the beverage and refrigerant leader conduits; and

Fig. 8 is an enlarged sectional view as taken on line 8—8 of Fig. 6, showing the manner and means for mounting a draft head on the draft station wall.

In the form shown the improved draft station unit **1** is contained in a rectangular box-like casing or housing comprising spaced outer and inner shells **2** and **3**, of stainless steel, or other suitable material, having a suitable insulating medium disposed between the side, end and bottom walls and having a top opening **4** provided with a fitted insulated cover or closure member **4.1**. A plurality of draft heads **5**, **6**, **7**, and **8**, mounted on the front vertical face of the casing, in horizontally spaced relation adjacent the top edge, are arranged to lead from the interior of the casing and to discharge downwardly; and a plurality of pipe connections for the supply of fruit juice, syrup, water, soda and refrigerant, extend from the interior of the casing, through the insulated bottom wall, and project downwardly therefrom.

This unit, as will be hereafter described, is a complete, self-contained, refrigerated, draft station for dispensing plain and mixed beverages and, as illustrated in Fig. 1, may be combined with or built onto a soda fountain cabinet **9** above and alongside of a suitable drain trough

10 for catching and draining away any spilled or overflow liquid issued from the draft heads. Preferably the draft unit projects above the counter 11 of the cabinet 9 so that the draft heads will be at a convenient height for manipulation by the operator, and the draft head nozzles are sufficiently spaced above the drain trough 10 to accommodate the usual soda cups or glasses in which the beverage is served. Thus the unit not only provides an efficient, practical, and convenient draft station but also enhances the overall appeearance of the draft installation, is more easily kept clean and sanitary, and, by including cooling coils for the beverage lines, minimizes the space requirements inside the cabinet for draft equipment and eliminates the need for running freezable lead lines through refrigerated spaces.

In the form shown two types of draft heads are mounted on the front wall of the draft unit, the draft heads 5 and 8 being of the usual type for dispensing a single liquid in either of two selective stream velocities, and the draft heads 6 and 7 being of the usual mixing type whereby a mixture of water and a fruit juice or syrup, in predetermined proportions, is dispensed. In either case, as shown in Figs. 5 and 6, each draft head is individually mounted directly onto the unit wall by means of a threaded mounting nipple 12 which extends through the outer shell 2, with a flange 13 abutting the outer wall surface, and which receives a lock unit 14, on its inner end, to clamp the nipple firmly to the outer shell 2 and hence to the unit wall. The draft head is then attached to the outer end of the nipple 12 by means of a coupling nut 15. This mounting of the draft head is thus wholly independent of any support from the beverage connections or leads on the inside of the unit and the heads may therefore readily be removed for repair or replacement without disturbing the fittings or connections on the inside of the unit.

As shown in Figs. 2, 4, 5 and 6 the cooler comprises a plurality of individual, flat, spiral wound conduit coils, each having its successive turns or loops, one within the other and lying in a common plane, and the several coils being arranged in stacked relation along a common axis with adjacent coils in surface to surface contact with each other. At least the outermost turn of each coil is a loop of substantially the same size and the stack of coils is suitably secured together so as to form a structural unit having a substantially uniform outer configuration. Predetermined ones of the coils in the stack are connected together end to end, to form a plurality of groups of coils, each group comprising a single continuous conduit having its own inlet and outlet and the individual coils of each group being alternated with the coils of the other groups so that no two coils of any one group will be in face to face contact with each other. Thus with the coils of one group comprising a single continuous conduit for a refrigerant, and the coils in each of the other groups comprising a single continuous conduit for a particular beverage fluid, a highly efficient cooler unit is provided whereby a plurality of different beverage fluids may be simultaneously cooled by a single refrigerant circuit.

This type of cooler, the manner of its construction, its uses, and its operation are fully described in my U. S. Patent No. 2,500,684, issued March 14, 1950, to which reference is hereby made for such further and more complete details as may be deemed to be necessary to carry out the practice of my present invention herein described and claimed.

In the form shown in Fig. 2, each pancake-like coil of the cooler unit is of generally oval shape and the cooler unit is disposed in the draft station casing with the coils on edge and the axis of the coil assembly normal to the front face of the casing on which the draft heads are mounted. The coil unit substantially fills the casing, as shown in Figs. 4, 5 and 6, and, after assembly of the coil unit in the casing and connection of its several coil groups with the respective draft heads, the casing is filled with a water-proof insulating material, such as an odorless asphalt material, up to a level just above the coils as indicated by the line 16 in Fig. 5. The coil unit is thus completely buried in an insulating medium, but an open space is left in the upper part of the casing for the leads which connect the coils with the draft heads, as will be hereafter described.

As shown the coil unit is made up of nine flat, spiral wound coils of which those designated R1, R2, R3 and R4 are refrigerant coils; those designated W1, W2 and W3 are plain water coils; and those designated S1 and S2 are carbonated water, or soda water coils.

The refrigerating group of coils comprise the expansion of evaporation component of a mechanical refrigeration system, not shown, using a suitable gas, such as Freon, as a refrigerant and the inlet leader 17 for this group, which connects with the expansion line of the refrigerating system, enters the draft station casing at the bottom thereof and is connected to the inlet end 18 of the coil R1. The coil R1 is connected by its center loop and a cross-over 19, to the center loop of the coil R2. The outer loop of the coil R2 is then connected by a line 20 (see Fig. 5) with the outer loop of the coil R3 and the latter is connected centrally with the coil R4 by a connector 21. The outer loop 22 of the coil R4 is then connected to an outlet leader 23 which runs transversely across the top of the coil unit and then downwardly, across the front face of the unit, through the bottom of the casing for connection with the suction line of the refrigeration system.

A suitable expansion valve, not shown, is provided in the inlet leader 17 at a convenient location below the draft station unit 1 and a suitable pressure regulating valve, also not shown, is provided, below the draft station unit, in the suction line 23.

The plain water group of coils W1, W2 and W3 are serially connected in the reverse order of the refrigerant coils. That is the first water coil W1 is the last of the coil stack, counting from the front of the unit, and is disposed next to the coil R4. The outer loop 24 of the coil W1 is laid parallel with the outer loop 22 of the coil R4 and its inlet leader 25 is run substantially parallel with the refrigerant outlet leader 23, across the top side of the coil unit and thence downwardly, alongside of the line 23 and through the bottom wall of the draft station casing. The inner loop of the coil W1 is centrally connected by a cross-over 26 with the inner loop of the coil W2, which is the third coil from the front of the coil stack, and the outer loop of the latter coil is then connected by a line 27 to the outer loop of the coil W3, which is the first coil of the stack. The center loop of the coil W3 is then connected by a riser line 28, and a coupling 29, with a pair of branching leads 30 and 31 which are suitably connected to the draft heads 7 and 8 which dispense the cooled plain water.

The soda or carbonated water coils S1 and S2 are also connected in reverse order with respect to the refrigerant coils, the first coil S1 being located between the last two refrigerant coils, R3 and R4, and the second soda coil S2 being in the middle of the stack between the coils R2 and R3. The soda inlet leader 32 enters the bottom of the draft station casing at the right hand side parallel with and alongside of the leaders 23 and 25 and, after passing upwardly to the top of the coil unit, crosses above the coil unit and connects with the outer loop 33 and the coil S1. The inner loop of the coil S1 is then cross-connected to the coil S2, by a central cross member 34, and the outer loop of the coil S2 is connected by a riser 35, and a coupling 36, with a lead 37 which terminates in a T-fitting 38 having connections 39 and 40 leading to the draft heads 5 and 6 respectively.

It will now be seen that the inlet leaders 25 and 32 for the water and soda coils, W1, and S1, respectively, are parallel with the outlet leader 23 from the last refrigerant coil R4 so that the warm end of the refrigerant circuit is

next to the warm ends of the water and soda circuits. As shown in Figs. 2 and 7, these three connections extend through a common opening in the bottom of the cooler unit and are disposed in contact with each other immediately below the unit casing, in a somewhat triangular arrangement to provide a seat for the thermostatic control bulb **41**, for the expansion valve which is normally in the refrigerant inlet line **17**. The bulb **41** is connected to the expansion valve by a suitable tubing **42** and the nested bulb and conduits are tightly wrapped in a suitable insulating material **41.1**, in the area of the bulb **41**, to protect the bulb from any temperature influence except that of the conduits. By locating the bulb **41** in this manner the expansion valve is made instantly responsive to any temperature change resulting from intake of warm soda or water, that might be caused by a draw from the draft heads, as well to the temperature of the gas in the expansion coil at its warm or leaving end. Thus the operation of the refrigerating coil unit is completely controlled by every factor to which it must respond for efficient cooling service.

As shown in Figs. 3, 4 and 7, an open ended pipe or conduit **43** is provided adjacent each end of the cooling unit casing, at its front side, to provide clear passages from the bottom of the casing to the top of the insulating material in which the coils are embedded for electrical conductors to a lighted sign mounted on top of the casing, as shown in Fig. 1, or for drainage of condensate from the top part of the casing, or for any other purpose that might be desired.

As shown in Figs. 2 and 3, the syrup and fruit juice supply lines **44** and **45**, respectively, which lead to the mixing heads **6** and **7**, enter the draft station casing from the bottom and pass directly to the upper part of the casing where they are joined by couplings **46** and **47** with the leads **48** and **49** to the draft heads. These syrup and fruit juice lines pass directly across the face of the last water coil W3, where the temperatures are the lowest and in this manner are cooled to a sufficient extent that the syrup or juice, when mixed with water or soda, will have practically no adverse effect upon the temperature of the delivered drink. If desired, the lines **44** and **45** may be soldered to the face of the coil W3 for maximum cooling effect, thereby assuring that the syrup and juice will have substantially the same temperature as the water when they enter the mixing heads.

A particular feature of this invention, in addition to the improved construction and assembly arrangement of the new refrigerated draft station unit, is the arrangement of the inlet leaders and the cooling coil assembly so that the leads to the draft heads, which are beyond the direct refrigerating influence of the coils, are so short that any liquid contained in the leads will be kept cool by convection currents within the body of the fluid regardless of the length of time that may occur between draws. Thus even the first drink drawn, after a relatively long idle or standing period will be at a properly cooled temperature. This means instant satisfactory drink delivery and wholly obviates any unnecessary wastage or loss of time that ordinarily occurs when warm liquid must be first drained from the relatively long leads of ordinary beverage dispensing systems.

This arrangement of short draft-head leads is shown in Fig. 3, and it will be seen that all of the connections and couplings between the draft heads and the cooling coil unit are located in the open space, at the upper part of the draft station casing, above the cooling coils where they are not only readily accessible but also where the distances to be traversed are the least. In a draft station of average size the over-all dimensions will be approximately 18 inches in width, 14 inches high and 6½ inches in fore and aft depth. Thus the longest lead, exposed beyond the direct cooling effect of the coils, will be less than 10 inches in length.

It should be noted that in the operation of cold beverage dispensers, the optimum delivered drink temperature should be 40° F. or less and to meet the recommendations of beverage syrup manufacturers the temperature should be within the range of 48° F. maximum and approximately 33° F. minimum. In operation of the present invention these limits are easily met because of the arrangement of the cooling coils and draft heads so that the connecting leaders are extremely short and wholly within the continuous cooling influence of the coils. Thus in actual test and after the cooler had been standing idle for approximately 12 hours, in a room at 80–90° F., the first drink drawn was delivered at a temperature of 45° F. and immediately thereafter the next drink was delivered at 38° F. Also in continuous dispensing operation the cooler unit delivers drinks at 40° F. from water entering the unit at 80° F.

A detail of the mounting means for the attachment of the draft heads to the draft station casing, is shown in Fig. 8 wherein it will be seen that mounting nipple **12** is a cylindrical member having a flange **50** at its forward or outer end and having pipe threads on its inner threaded shank of the draft head to secure the same to the nipple, is mounted on the nipple **12** and is retained axially by the collar **50** in the usual manner. As shown, a sleeve **51** bearing the radial flange **13** at its rearward end, is also mounted on the forward end of the nipple **12** in endwise abutment with the flange **50** and with its cylindrical body interposed between the collar **15** and the nipple **12**. Thus when the sleeve and collar are mounted on the nipple, and the threaded end of the nipple is inserted through a suitable opening in the casing wall **2**, the flange **13** may be brought into firm tight contact with the casing wall and the nipple secured, by means of the nut **14** threaded onto the inner end of the nipple. Preferably a washer **52** is interposed between the nut **14** and the inner surface of the wall **3** to provide a firm bearing for the clamping action of the nut.

The nipple **12**, as shown, is a solid body concentrically counterbored at its front or flanged end to provide a cylindrical recess **53** for a cylindrical plug portion **54**, extending axially from the threaded shank of the draft head body and formed to snugly fit into the recess **53**. The plug portion **54** is drilled axially to provide a passage **55**, leading to the valving chamber of the head, and the body of the nipple **12** is likewise drilled to provide a passage **56**, aligned with the plug passage **55**, for the fluid leader conduit **39** which extends through the nipple and into the recess **53**. The fluid conduit has a tight fit in the passage **56** and its projecting end is snugly received in the plug passage **55** when the plug is inserted in the recess **53**. Also a suitable gasket **57** is disposed over the projecting end of the fluid conduit, for engagement by the end of the plug portion **54**, when it is drawn up by the collar **15**, and, as shown, the margin of the plug passage **55** at its entering end, is beveled or chamfered so that the gasket **57** will be forced into tight leak proof engagement with the fluid conduit.

In order to avoid any strain on the fluid conduit **39** when the collar **15** is being tightened on the shank of the draft head, an axially extending leader pin **58** is mounted on the plug portion **54** for engagement in a drilled passage **59** in the nipple body. This leader pin also serves as a centering means for proper angular positioning of the draft head and for proper alignment of the plug passages with the fluid conduits, when a pair of fluid conduits are employed, as in the case of the mixing heads **6** and **7**.

It will be understood that any number or arrangement of draft heads may be employed with the improved draft station unit herein described and that draft heads may be mounted on either or both sides of the unit casing. Also any combination of single or mixing heads may be used for dispensing one or more kinds of beverage fluids.

The main advantages of this invention reside in the simple, compact and efficient construction of the improved draft station whereby a single unitary structure is provided

to furnish an improved mount for a plurality of draft heads and include the necessary cooling functions for the beverage lines supplying the draft heads; and in the improved combination in a single draft station unit of a complete cooler unit capable of cooling a plurality of beverage supply circuits at the dispensing heads, whereby unrefrigerated leaders from cooler to draft heads are substantially eliminated.

Other advantages of the improved draft station unit are to be found in the fact that, as a complete draft head and cooler assembly, the unit may be readily combined with substantially any fountain or cabinet construction, or installation, without material structural alteration thereof, and may be easily removed or replaced in case change is necessary; and in the fact that, through the unitary construction of the draft station cooler, manufacturing, assembly and installation costs are considerably reduced.

Still further advantages are to be found in the efficiency of the operation of the improved station in its function as a cold drink dispenser whereby a greatly increased delivery capacity is had without any adverse effect upon its function of delivering a properly cooled drink; in the increased ability of the unit to cool a continuously drawn fluid through a range of substantially 40° to 50° F., as may often be necessary; and in the improved ability of the unit to deliver a cold beverage at any time, which will meet the most stringent requirements as to delivered drink temperature.

Although but one specific embodiment of this invention is herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of the invention as defined in the following claims.

What is claimed is:

1. A unitary beverage draft station comprising a hollow casing having insulated walls on all sides, a draft head rigidly mounted on one of the walls of said casing on the outer side thereof, and a cooling unit substantially filling said casing; said cooling unit comprising a plurality of groups of serially connected spirally arranged coils of tubing, the coils of one group being alternated with those of another group so that no two coils of any one group are next to each other, and all of said coils being arranged along a common axis with adjacent coils in heat-exchange relation with each other; inlet and outlet conduits extending through a wall of said casing for a fluid refrigerant and having connection with respective ends of one coil group, a beverage inlet conduit extending into said casing and connected to one end of another coil group, the last-mentioned coil group having its outlet end coil adjacent said draft head, and an outlet leader joining said last-mentioned coil and said draft head; the last-mentioned coil group being arranged with its outlet end in heat-exchange relation with the inlet end of the coils of the refrigerant group, and a beverage flavoring conduit arranged in heat-exchange relation with the outlet end of the beverage coil group for connection with said draft head; and thermostatic control means for maintaining a predetermined temperature in the entire length of said beverage coil group, said control means being operative in response to the inlet temperature of said beverage coil group.

2. A draft station unit comprising a hollow casing having top, side and bottom walls, a draft head rigidly mounted on the outer side of the casing sidewall adjacent the upper end thereof, a plurality of separate fluid conduits in said casing each arranged in a series of connected coils with the coils of said conduits in alternate mutually contacting heat exchange relation with each other, inlet and outlet leads from one of said conduits extending through said casing at the bottom thereof for circuit connection with a source of fluid refrigerant, an inlet lead at the bottom of said casing having connection with one end of another of said conduits for supplying a beverage fluid thereto, the outlet-end-coil of the last mentioned conduit being adjacent said draft head and the direction of fluid flow in said one conduit being the reverse of that in the first mentioned conduit, a leader directly connecting the outlet end of the last named conduit with said draft head, a flavoring-fluid conduit leading through said casing to said draft head in heat exchange relation with the said outlet-end-coil, an insulating material substantially filling said casing and wholly embedding said conduit coils and the leads thereto in a substantially solid mass, and thermostatic control means for maintaining the contents of said beverage coils at a predetermined temperature, said control means being arranged in heat-exchange relation with the inlet of said beverage coils and the outlet of said refrigerant coils.

3. A beverage draft station comprising a hollow casing, a draft head rigidly mounted on said casing on the outer side thereof, and a cooling unit substantially filling the interior of said casing, said cooling unit comprising a plurality of groups of serially connected flat spiral wound coils of tubing, the coils of one group being alternated with those of another group so that no two coils of any one group are next to each other, and all of said coils being stacked on a common axis with adjacent coils in face to face heat conducting relation with each other, inlet and outlet conduits extending into said casing for a fluid refrigerant and having connection with respective ends of one coil group, a beverage inlet conduit entering said casing and having connection with one end of another coil group, and an outlet conduit leading directly to said draft head from the last mentioned coil, and an insulating material substantially filling the spaces within said casing around said coils and conduits and embedding said coils and conduits in a solid mass.

4. A beverage draft station comprising a hollow casing having insulated walls on all sides, a draft head rigidly mounted on one of the walls of said casing on the outer side thereof, and a cooling unit substantially filling the interior of said casing, said cooling unit comprising a plurality of groups of serially connected flat spiral wound coils of tubing, the coils of one group being alternated with those of another group so that no two coils of any one group are next to each other, and all of said coils being arranged along a common axis with adjacent coils in face to face contact with each other, inlet and outlet conduits extending through a wall of said casing for a fluid refrigerant and having connection with respective ends of one coils group, a beverage inlet conduit entering said casing and having connection with one end of another coil group, the last mentioned coil group having its outlet-end-coil adjacent said draft head, and an outlet leader leading directly to said draft head from the last mentioned coil, and an insulating material substantially filling the spaces within said casing around said coils and conduits and embedding said coils and conduits in a substantially solid mass.

5. A beverage draft station comprising a hollow casing having insulated walls on all sides, a draft head rigidly mounted on one of the walls of said casing on the outer side thereof, and a cooling unit substantially filling the interior of said casing, said cooling unit comprising a plurality of groups of serially connected flat spiral wound coils of tubing, the coils of one group being alternated with those of another group so that no two coils of any one group are next to each other, and all of said coils being arranged along a common axis with adjacent coils in face to face contact with each other, inlet and outlet conduits extending through a wall of said casing for a fluid refrigerant and having connection with respective ends of one coil group, a beverage inlet conduit entering said casing and having connection with one end of another coil group, the last mentioned coil group having its outlet-end-coil adjacent said draft head, and an outlet leader leading directly to said draft head from the last mentioned coil, the last mentioned coil group being ar-

ranged with its coils in the reverse order of the refrigerant group coils with respect to direction of fluid flow therein and with its outlet-end-coil next adjacent said draft head, and an insulating material substantially filling the spaces within said casing around said coils and conduits and embedding said coils and conduits in a substantially solid mass.

6. A beverage draft station comprising a hollow casing having insulated walls on all sides, a draft head rigidly mounted on one of the walls of said casing on the outer side thereof, and a cooling unit substantially filling the interior of said casing; said cooling unit comprising a plurality of groups of serially connected flat spiral wound coils of tubing, the coils of one group being alternated with those of another group so that no two coils of any one group are next to each other, and all of said coils being arranged along a common axis with adjacent coils in face to face contact with each other; inlet and outlet conduits extending through a wall of said casing for a fluid refrigerant and having connection with respective ends of one coil group, a beverage inlet conduit entering said casing and having connection with one and of another coil group, the last mentioned coil group having its outlet end coil adjacent said draft head, and an outlet leader leading directly to said draft head from the last mentioned coil; the last mentioned coil group being arranged with its coils in the reverse order of the refrigerant group coils with respect to direction of fluid flow therein and with its outlet end coil next adjacent said draft head, and a beverage flavoring-fluid conduit in said casing leading across the face of the outlet-end-coil of the beverage coil group for connection with said draft head; and an insulating material substantially filling the spaces within said casing around said coils and conduits and embedding said coils and conduits in a substantially solid mass.

7. A draft station comprising a hollow box-like casing having a vertical outer wall and a draft head rigidly mounted adjacent its upper end, a cooling unit mounted within said casing and having a plurality of groups of serially connected flat spiral wound coils of tubing, each of said groups having an inlet end and an outlet end and the coils of one group being alternated with those of another group so that no two coils of the same group are next to each other, all of said coils being arranged along a common axis with adjacent coils in face to face heat conducting relation with each other, said common axis being normal to said vertical outer wall, inlet and outlet conduits for a fluid refrigerant leading into said casing at the bottom end thereof and having connection with the respective ends of one of said coil groups, a beverage inlet conduit entering at the bottom end of said casing and having connection with the inlet end of another coil group, a leader directly connecting the outlet end of the last mentioned group with said draft head, and an insulating material substantially filling the interior of said casing and embedding said coils and conduits in a solid mass.

8. A draft station comprising a hollow box-like casing having a vertical outer wall and a draft head rigidly mounted thereon adjacent its upper end, a cooling unit mounted within said casing and having a plurality of groups of serially connected flat spiral wound coils of tubing, each of said groups having an inlet end and an outlet end and the coils of one group being alternated with those of another group so that no two coils of the same group are next to each other, all of said coils being arranged in a stack along a common axis with adjacent coils in face to face heat conducting relation with each other, said common axis being normal to said vertical outer wall, inlet and outlet conduit for a fluid refrigerant leading into said casing at the bottom end thereof and having connnection with the respective ends of one of said coil groups, a beverage inlet conduit entering at the bottom of said casing and having connection with the inlet end of another coil group, and a leader directly connecting the outlet end of the last mentioned coil group with said draft head, the outlet end coil of the last mentioned group and the inlet end coil of the first mentioned group being adjacent each other at one end of the coil stack and the fluid flow through said groups being in respectively opposite directions.

9. A draft station comprising a hollow box-like casing having a vertical outer wall and a draft head rigidly mounted thereon adjacent its upper end, a cooling unit mounted within said casing and having a plurality of groups of serially connected flat spiral wound coils of tubing, each of said groups having an inlet end and an outlet end and the coils of one group being alternated with those of another group so that no two coils of the same group are next to each other, all of said coils being arranged in a stack along a common axis with adjacent coils in face to face heat conducting relation with each other, said common axis being normal to said vertical outer wall, inlet and outlet conduits for a fluid refrigerant leading into said casing at the bottom end thereof and having connection with the respective ends of one of said coil groups, a beverage inlet conduit entering at the bottom of said casing and having connection with the inlet end of another coil group, a leader directly connecting the outlet end of the last mentioned coil group with said draft head, a flavoring-fluid conduit in said casing leading across the face of the outlet-end-coil of the last mentioned group in heat conducting relation therewith and having connection with said draft head, and an insulating material substantially filling the interior of said casing and embedding said coils and conduits in a solid mass.

10. A draft station comprising a hollow box-like casing having a vertical outer wall and a plurality of draft heads rigidly mounted thereon adjacent its upper end, a cooling unit mounted within said casing and having a plurality of groups of serially connected flat spiral wound coils of tubing, each of said groups having an inlet end and an outlet end and the coils of one of said groups being alternated with those of the other groups so that no two coils of the same group are next to each other, all of said coils being arranged in a stack along a common axis with adjacent coils in face to face heat conducting relation with each other, said common axis being normal to said vertical outer wall, inlet and outlet conduits for a fluid refrigerant leading into said casing at the bottom end thereof and having connection with the respective ends of one of said coil groups, a plurality of beverage inlet conduits entering at the bottom end of said casing and having connection with the respective inlet ends of other coil groups, a leader directly connecting the outlet end of each of said other coil groups with a respective one of said draft heads, and an insulating material substantially filling the interior of said casing and embedding said coils and conduits in a solid mass.

11. In a draft station, the combination with a hollow box-like casing having insulated top, bottom and side walls, and a draft head rigidly mounted on a side wall of said casing, of a cooling means mounted within said casing and comprising a plurality of groups of serially connected flat spiral wound coils of tubing arranged in a stack along a common axis in face to face heat conducting relation and substantially filling the interior of said casing, each of said coil groups having an inlet end and an outlet end and the coils of one group being alternated with those of another group so that no two coils of the same group are next to each other, one of said coil groups comprising a refrigerant expansion conduit and having inlet and outlet connections therefor entering the bottom of said casing, another of said coil groups being a conduit for a beverage fluid and having an inlet therefor

entering the bottom of said casing, a leader directly connecting the outlet end of the last mentioned coil group with said draft head, and an insulating material substantially filling the interior of said casing and embedding said coils in a substantially solid mass.

12. In a draft station, the combination with a hollow box-like casing having insulated top, bottom and side walls, and a draft head rigidly mounted on a side wall of said casing, of a cooling unit mounted within said casing and comprising a plurality of groups of serially connected flat spiral wound coils of tubing arranged in a stack along a common axis in face to face heat conducting relation with each other and substantially filling the interior of said casing, each of said coil groups having an inlet end and an outlet end and the coils of one group being alternated with those of another group so that no two coils of the same group are next to each other, one of said coil groups comprising a refrigerant expansion conduit and having inlet and outlet connections therefor entering the bottom of said casing, another of said coil groups being a conduit for a beverage fluid and having an inlet therefor entering the bottom of said casing, the inlet-end-coil of the last mentioned coil group being at

the opposite end of the coil stack from the inlet-end-coil of the expansion coil group, a leader directly connecting the outlet-end-coil of the beverage fluid coil group with said draft head, a flavoring-fluid conduit entering the bottom of said casing and passing across the face of the outlet-end-coil of the last mentioned group in heat conducting relation therewith and having connection with said draft head, and an insulating material substantially filling the interior of said casing and embedding said coils in a solid mass.

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