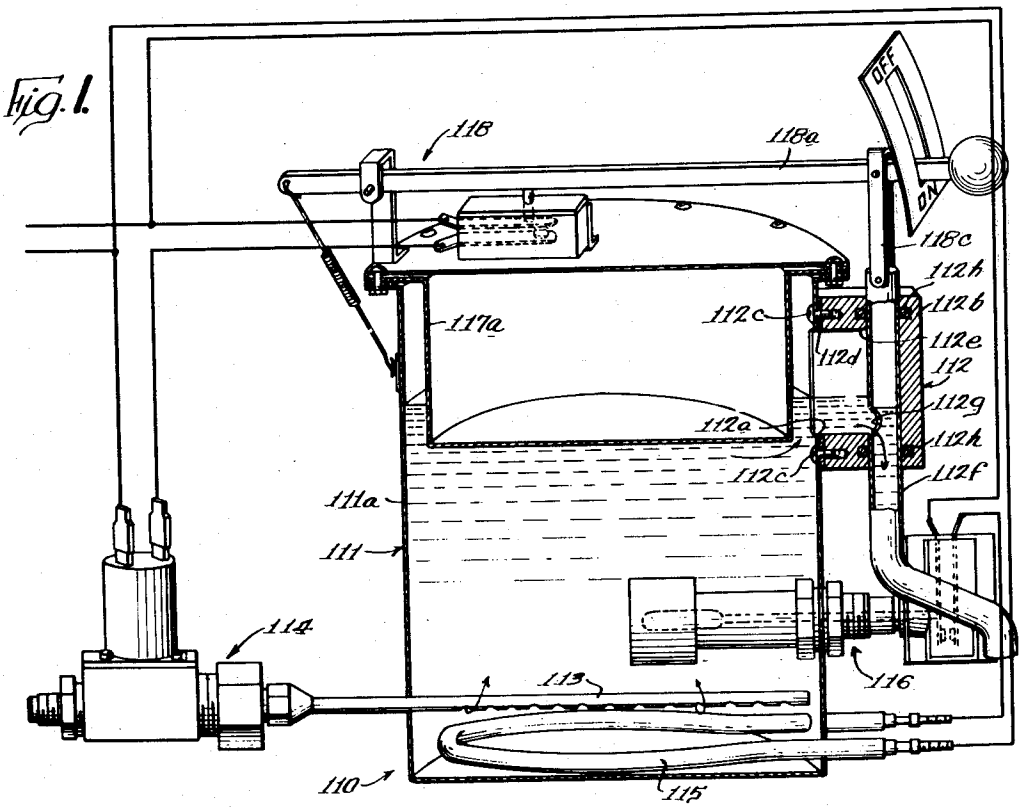
March 26, 1963 H. R. KARLEN ETAL 3,082,915

HOT WATER DISPENSER

Original Filed June 22, 1956

Fig. 1.



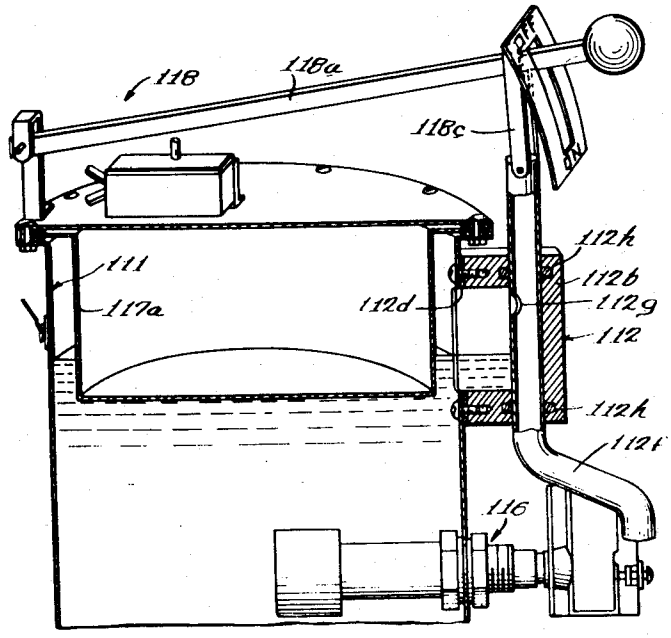


Fig. 2.

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HOT WATER DISPENSER

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Original application June 22, 1956, Ser. No. 593,086, now Patent No. 2,869,760, dated Jan. 20, 1959. Divided and this application Dec. 1, 1958, Ser. No. 777,307
6 Claims. (Cl. 222—146)

This invention relates to a liquid dispenser and in particular to a hot water dispenser of the open-to-atmosphere type.

This application comprises a division of copending Harvey R. Karlen and David C. Eisendrath application Serial No. 593,086 for a Hot Water Dispenser, filed June 22, 1956, and now issued as United States Letters Patent No. 2,869,760 and owned by the common assignee.

One form of liquid dispenser is that wherein a tank is provided with an outlet which is open to atmosphere at all times, and liquid flow through the tank and from the outlet is controlled by means associated with the inlet to the tank. In such a device, when the liquid flow into the tank is terminated, all liquid above the bottom of the outlet flows substantially immediately from the tank through the outlet. However, should the level of the liquid be raised subsequently above the bottom of the outlet due to any cause, this additional liquid will be discharged through the outlet. Such a result could be produced merely by moving the tank so as to affect the liquid level, e.g., by tilting the tank or vibrating it.

This subsequent discharge or dripping of the liquid from the tank through the outlet may also result where a temperature variation in the liquid occurs, as the coefficient of thermal expansion of liquids such as water is sufficient to cause a substantial volume change over a relatively small temperature range. In water heating devices for raising liquid, such as tap water, to substantially boiling temperature, this is a very serious problem.

Applicants have devised and herein disclose and claim a new and improved liquid dispensing means of the open-to-atmosphere type and arranged to prevent positively undesirable discharge.

A principal object of the invention is to provide a new and improved hot water dispenser of the open-to-atmosphere type which is non-dripping, when the flow therefrom is terminated.

Another object of the invention is to provide a hot water dispenser wherein means are provided for maintaining the outlet above the level of the free liquid in the tank whenever liquid flow into the tank is terminated.

A further object is to provide a hot water dispenser having means for positioning the outlet substantially above the level of the liquid in the tank when the liquid flow thereinto is terminated.

Other features and advantages of this invention will be apparent from the following description, taken in connection with the accompanying drawing wherein:

FIGURE 1 is a perspective view of a dispenser embodying the invention, with portions thereof shown in diametric section, and with the electrical wiring shown diagrammatically; and

FIGURE 2 is a fragmentary view of the dispenser with the parts thereof shown in a full shutoff position.

In the exemplary embodiment of the invention, as disclosed in the drawing, a hot water dispenser generally designated **110** is seen to comprise a tank **111** having an outlet **112** and an inlet **113**. Flow control means **114** are provided to regulate flow of supply water

through inlet **113** into tank **111**. Extending into tank **111**, adjacent the bottom thereof, is a heating means **115** and thermostat control means **116** arranged to control the energization of heating means **115** and, thereby, the temperature of the liquid in tank **111**.

Tank **111** is illustratively shown as a cylindrical tank, having a sidewall **111***a*. Outlet **112** is provided in sidewall **111***a* and comprises an opening **112***a* preferably formed as a vertically elongated slot. A block **112***b* is secured to wall **111***a* by suitable screws **112***c* with a gasket **112***d* therebetween for sealing the connection. A recess **112***e* opening through one side of the block is arranged to be in communication with the entirety of slot **112***a* and, extending vertically through the block in recess **112***e*, is an open-ended discharge tube **112***f*. A relatively small hole **112***g* is provided in the wall of the tube to provide communication between the interior of the tube and recess **112***e*, allowing liquid to pass from the tank through the recess and outwardly through the tube. O-ring sealing means **112***h* are provided in block **112***b* for preventing leakage from outlet **112** while permitting vertical positioning of the tube and, therefore, the positioning of hole **112***g* relative to the block.

Inlet **113** comprises a tubular element extending through wall **111***a* adjacent the bottom of the tank. At its outer end, inlet **113** is connected to the flow control means **114** which illustratively comprises a solenoid-operated valve adapted to be in the valve-opened position when energized and in the valve-closed position when de-energized. Valve **114** is further adapted to be connected to a source of liquid such as cold water under pressure (not shown).

Heating means **115** illustratively comprises an electrical heating coil which passes through wall **111***a* and is disposed within the tank below the inlet tube **113**. The heating coil is connected exteriorly of tank **111** to a suitable source of electrical power (not shown). Thermostatic control means **116** extends through tank wall **111***a* somewhat above inlet **113** and heating coil **115**. The thermostatic control means is connected in series with heating coil **115** across the power supply. Thus, the heating coil **115** is energized whenever the temperature of the liquid within the tank falls below a predetermined point.

An imperforate housing **117***a* is arranged to extend from the top of tank **111** downwardly to below the bottom of slot **112***a*. Operating means **118** are provided, including an operating lever **118***a* and a yoke **118***c* which connects the lever **118***a* to tube **112***f*.

A more detailed description of the elements of dispenser **110** which are similar to the elements of dispenser 10 of the above indicated Karlen and Eisendrath application Serial No. 593,086 will be found in that application, to which reference may be had for a complete understanding of the structure and functioning thereof.

The functioning of dispenser **111** is as follows. As best seen in FIGURE 2, when lever **118***a* is pivoted to the "Off" position, hole **112***g* is positioned substantially above the water in the tank **111** and recess **112***e* which, in effect, increases the effective volume of the tank for holding the water. This prevents dripping of water from tube **112***f* when flow control means **114** is closed. As seen in FIGURE 1, when lever **118***a* is pivoted to the "On" position, hole **112***g* is moved to its lower limit of travel, horizontally of the bottom of slot **112***a*. At the same time, operating means **118** causes solenoid valve **114** to be opened, thereby admitting supply water through inlet **113** into tank **111**. This causes the previously heated water to pass outwardly through outlet **112** to effect a normal dispensing of hot water from the dispenser.

While we have shown and described one embodiment of our invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as defined in the appended claims.

We claim:

1. In a liquid dispenser, means of the character described, comprising: a tank; a vertically movable outlet from the tank providing communication between the inside and outside of the tank at all times; an inlet into the tank; valve means for controlling flow of liquid through said inlet into said tank; and means associated with the valve means and outlet, the last named means being selectively operable to move the outlet to one position and concurrently arrange the valve means to cause liquid to flow into said inlet, and to move the outlet to a second, higher position above the level of liquid in the tank and concurrently arrange the valve means to cause the liquid flow to be stopped.

2. In a liquid dispenser, means of the character described, comprising: a tank having a top; a vertically movable outlet from the tank adjacent the top providing communication between the inside and outside of the tank at all times; a housing in the tank extending downwardly from the top to below the outlet and arranged to extend over a substantial area of the tank laterally of the outlet; an inlet into the tank; means for controlling flow of liquid through said inlet into the tank; and means for alternatively increasing and decreasing the volume of the tank effective for holding liquid comprising means for raising and lowering the outlet, said raising and lowering means being operably associated with the flow controlling means to move the outlet to one position when liquid is flowing into said inlet and to a second, higher position above the level of liquid in the tank when liquid flow is stopped.

3. In a liquid dispenser, means of the character described, comprising: a tank having a vertical wall and a top; an elongated vertical slot in said wall adjacent the top; a block sealingly secured to said wall and covering the slot, said block having a recess communicating with the slot; a tube vertically movably carried by the block to extend through said recess and provided with an opening having a vertical extent substantially less than the vertical extent of the slot, said slot, block, and tube coacting to form a vertically adjustable outlet means providing communication between the inside and outside of the tank at all times; and means for introducing a volume of liquid into the tank and concurrently disposing the tube with said opening spaced below the top of the slot.

4. In a liquid dispenser, means of the character described, comprising: a tank having a vertical wall and a top; an elongated vertical slot in said wall adjacent the top; a block sealingly secured to said wall and covering the slot, said block having a recess communicating with the slot; a tube vertically movably carried by the block to extend through said recess, said tube being provided with an opening communicating with the recess and having a vertical extent substantially less than the vertical extent of the slot, and a lower outlet; an inlet into said tank; means for controlling flow of liquid through said inlet and into said tank; and means for operating said tube and said last named means concurrently to dispose the tube with the opening below the top of said slot and effect fluid flow through the inlet, through the tank, and outwardly through said slot, recess, tube opening, tube and tube outlet, and to operate the flow controlling means to terminate fluid flow through the inlet and to raise the tube opening subsequent to termination of fluid flow through the inlet.

5. In a hot liquid dispenser, means of the character described, comprising: a tank having a vertical wall and a top; an elongated vertical slot in said wall adjacent the top; a block sealingly secured to said wall and covering the slot, said block having a recess communicating with the slot; a tube vertically movably carried by the block to extend through said recess and provided with an opening having a vertical extent substantially less than the vertical extent of the slot, said slot, block, and tube coacting to form a vertically adjustable outlet means providing communication between the inside and outside of the tank at all times; an inlet into said tank; a solenoid valve for controlling liquid flow into said inlet; an electrical switch for controlling the solenoid valve, said valve being opened when said switch is closed; a lever arranged alternatively to move the tube downwardly and close said switch and move the tube upwardly and open said switch; and means for heating the liquid in the tank.

6. In a liquid dispenser, means of the character described, comprising: a tank having a top; an inlet into the tank; means for controlling flow of liquid through said inlet into the tank; a vertically movable outlet from the tank adjacent the top providing communication between the inside and the outside of the tank at all times; and means for alternatively increasing and decreasing the volume of the tank effective for holding liquid including means operated by the flow control means for raising the outlet when said flow control means is arranged to prevent flow into the tank and lowering the outlet when said control means is arranged to permit flow into the tank.

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