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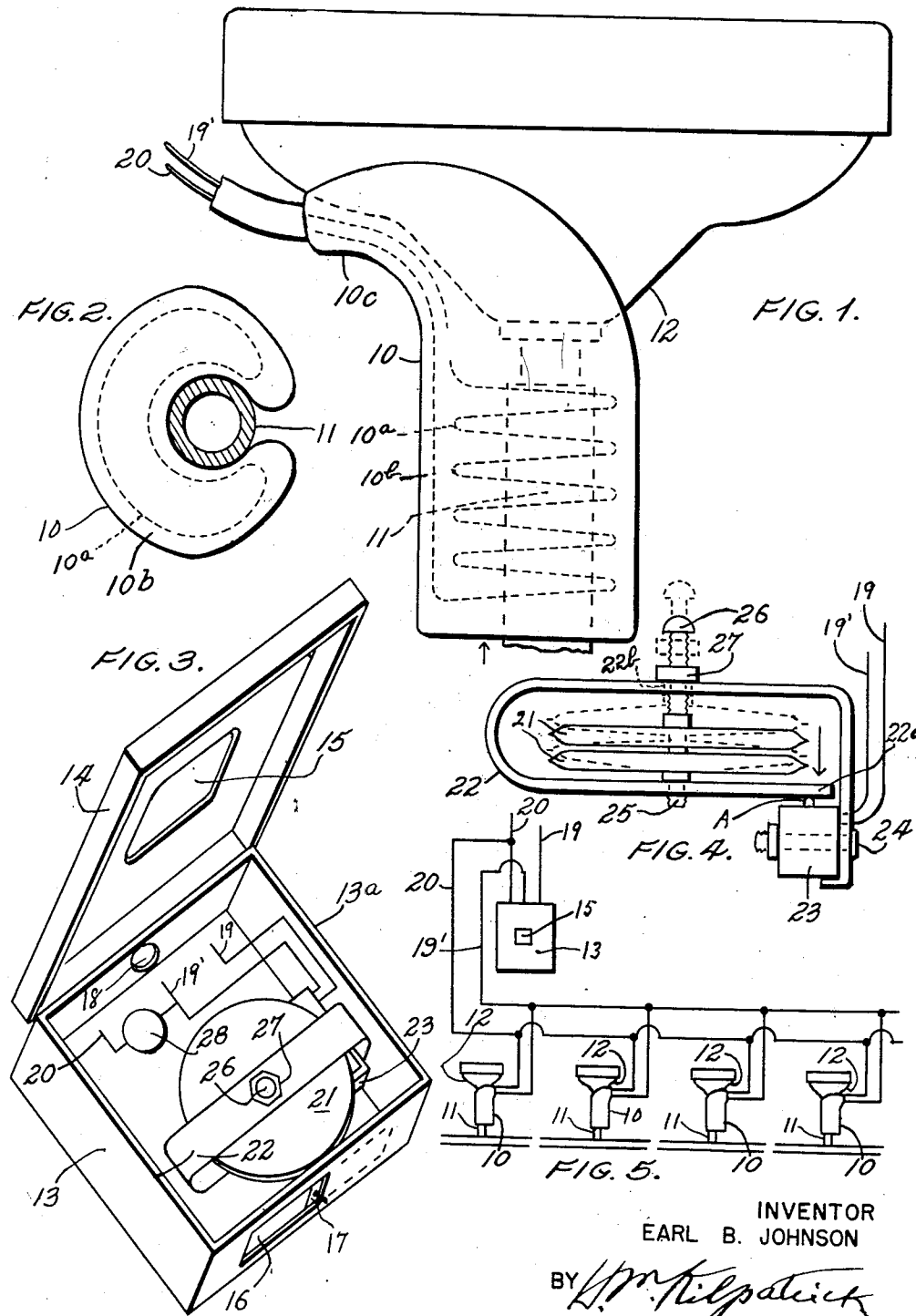
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AUTOMATIC HEATING SYSTEM FOR DRINKING FOUNTAINS

Filed July 13, 1948

2 SHEETS—SHEET 1



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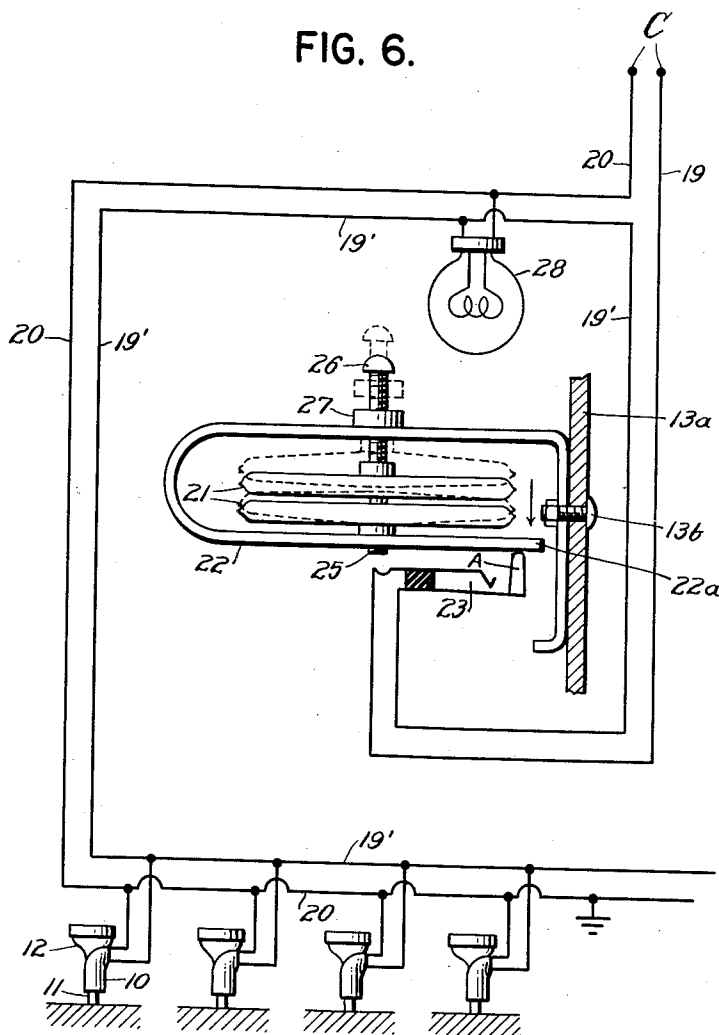
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2 SHEETS—SHEET 2

FIG. 6.



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AUTOMATIC HEATING SYSTEM FOR
DRINKING FOUNTAINS

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34 Claims. (Cl. 219—39)

1

This invention relates to heating means for drinking fountains and more particularly for heating means for drinking fountains of the type illustrated, described and claimed in my co-pending applications, Serial No. 493,331, filed July 3, 1943, and Serial No. 557,987, filed October 10, 1944 now Patent No. 2,452,305, issued October 26, 1948, and also an additional application Serial No. 26,277, filed May 11, 1948, and more particularly to the heating system described in said application Serial No. 557,987 for controlling the water temperature within the fountains to prevent freezing.

An important object of the invention is to provide a detachable electric heater unit so formed as to come into substantially direct contact with the water supply pipe and a portion of the fountain.

Another object is to provide means whereby the fountain heater is automatically controlled to provide heat only as needed to maintain above freezing temperatures within the fountains regardless of weather temperatures.

Another object is to provide an automatically controlled fountain heater system in which the automatic means of control is remote from the fountain and fountain heater and is installed in the electric feed line at any desirable location away from the dampness of the fountain and elevated to a height where the means of control will remain clean and effective in operation.

Another object is to provide an automatic fountain heater control that is remote from the fountains and fountain heaters and whereby one automatic control will control the heat as required by a single fountain or for several fountains, as might be desired.

The inventive features for the accomplishment of these and other objects are shown herein in connection with a heating system which briefly stated includes an electric heating unit so formed as substantially to contact a portion of the fountain and extend downwardly partially surrounding the water supply pipe thereof, and an automatic control for the fountain heater adapted to operate the heaters with a minimum of electricity, by providing heat only as needed. The automatic control means is contained within an enclosure which is installed in any desirable location remote from the fountains and dampness.

The preferred form of control means comprises a unique arrangement of a wafer type thermostat a micro-type switch and a heating element in the form of a pilot light bulb.

In the accompanying drawing showing by way

2

of example one of several possible embodiments of the invention,

Fig. 1 shows in elevation a fountain and adjacent portion of the water supply pipe with the fountain heater attached;

Fig. 2 shows a bottom plan view of the lower end only of the fountain heater looking in the direction of the arrow at the lower part of Fig. 1 the water supply pipe being shown in section;

Fig. 3 shows in perspective a housing having therein the automatic fountain heater control, the housing cover being raised to show the arrangement of parts;

Fig. 4 shows in elevation a detail of Fig. 3, drawn, to a larger scale; and

Figs. 5 and 6 show wiring diagrams of the automatic fountain heater control and a series of fountains equipped with heaters.

Figures 1 and 2 show a simple and effective fountain heater 10 which comprises a well known and simple form of resistor coil 10a formed and molded within a mass of dielectric material forming a solid waterproof housing 10b for the coil. As the heater is used only at comparatively low temperatures, materials such as molded rubber or yieldable plastic are suitable for the housing 10b. The lower portion of the housing 10b is formed to fit substantially around the water supply pipe 11 and is easily forced around and is supported by said supply pipe. The upper end portion 10c of the housing 10b is curved outward and formed to fit a portion of the lower side of the fountain 12 and receives the ends of the heater coil 10a. The housing 10b is yieldably held in place by the resistance to change in shape of the material from which the housing 10b is formed.

Figures 3 to 6 show the automatic control and wiring diagram for a series of fountain heaters 13. The automatic control means is contained within an enclosure or housing 13 having preferably a hinged front cover 14 provided with an observation window 15. The lower end of the housing 13 has an opening 16, with sliding door or damper 17 for adjusting the size of the opening or closing it completely. The top of the housing 13 has an opening 18 for the electric wires 19, 19', 20. A heat sensitive means comprising two axially connected wafer thermostats 21 is located within the housing 13 and is carried by a yieldable frame 22 which is secured to one side wall 13a of the housing 13 by means of a small bolt 13b (Fig. 6). A normally closed micro-switch 23 is secured to the stationary end of the frame 22 by means of bolt 24. The yieldable

frame 22 is so formed that its free end portion 22a presses downwardly (in the direction of the arrow of Fig. 4) upon the actuating pin A of the switch 23 with sufficient pressure to hold the normally closed micro-switch 23 in an open position as in Fig. 6. One of the wafer thermostats 21 is secured to the side of the frame 22 having the free end portion 22a by means of a stud 25 threaded tightly into the frame. The other thermostat 21 is provided with a bolt 26 secured thereto which passes freely through a hole 22b in the frame 22 and is provided with an adjusting nut 27. This arrangement of a normally closed micro-switch 23, thermostat 21 and yieldable frame 22 provides means whereby the thermostat is free to expand (as shown by dotted line Fig. 4) during the warm summer periods without applying unnecessary strain on the thermostat, frame or switch. When the weather gets colder and the temperature reaches a little above the freezing point, the nut 27 is adjusted by hand to cause a slight pull on the frame 22. As the weather temperature grows colder, the thermostats 21 apply additional strain and pull the free end 22a of the frame 22 outward from the micro-switch 23 and relieve the pressure from the actuating pin A which allows the switch to actuate itself into a closed position and turn on the fountain heaters 10. A small heating element in the form of a pilot light bulb 28 is suitably mounted within the housing 13.

The wires 19 and 20 are connected to a suitable source of electric current as at C (Fig. 6). The ungrounded hot wire 19 is secured to one member of the micro-switch 23, to the other member of the switch wire 19' is connected one terminal of the pilot heater light 28 and is continued to and is connected to one terminal of the fountain heater 10. The grounded wire 20 is connected to the other terminal of the pilot heater light 28 and is continued to the other terminal of the fountain heater 10. The fountain heaters 10 (Fig. 5) are connected between wires 19' and 20, and are therefore connected in parallel with the pilot heater light 28. Therefore when the weather and the temperature changes in the housing 13 and the heat of the pilot heater light cause the thermostat to control the pilot light, the heaters in the series of heated fountains will be similarly controlled.

A fountain heater incorporating a resistor coil of approximately 50 watt capacity and of a length to generate the required heat to raise a given temperature at the heater contact surface approximately 90° F. in cooperation with an automatic heater control housing approximately 5" x 5" x 3½" equipped with a 7½ watt pilot heater light provides an effective cooperative heating balance to maintain above freezing temperatures within the fountains regardless of weather temperature.

As the automatic control is remote from the fountain heaters, adjustment of the damper 17 may be desirable; and the thermostat may be caused to be more quickly cooled by the weather temperature by opening wider the opening 16, thereby to provide more heat to the fountains.

The damper 17 may be adjusted by hand from over the opening 16 until the desired heat is provided at the fountains.

To adjust the automatic fountain heater control when the temperature near the fountains is about 34° F. or slightly above freezing point, the adjusting nut 27 is adjusted toward the frame 22 until enough tension is applied to the thermostat

21 to lift the free end 22a of the frame 22 outward from the pin A of the micro-switch 23 until the micro-switch 23 moves into its normally closed position causing the pilot heater light to light up. The adjusting nut 27 is then slowly adjusted until the pilot heater light goes off.

As the weather temperature grows colder it will cool the interior of the housing 13 in substantially the same proportion as it cools the fountains. As the thermostat 21 cools it pulls the free end of the frame 22 outward from the micro-switch 23 until the switch snaps into normally closed position to complete the circuit through the pilot heater light 28 and the fountain heaters 10 at the same time. The pilot heater light 28 heats the interior of the housing 13 and the thermostats 21 in proportions similar to that of the fountain heaters and when above freezing temperatures are reached in the housing 13 and the heaters 10 the current is cut off until more heat is again needed.

The housing 13 and the automatic control therein are mounted in any suitable and convenient dry location and height remote from the dampness of the fountains.

While herein details of the invention are described in the specification and some of the claims, the invention as described in the broader claims is not limited to these, and various changes may be made without departing from the scope of the invention as claimed in the broader claims.

The invention claimed is:

1. In combination, a fountain having a lower supply pipe; an electric fountain heater, said heater comprising a resistor coil formed and molded within a yieldable enclosure with said enclosure formed to fit substantially around a portion of the water supply pipe and extending upward and outward in contact with a portion of the lower part of said fountain; and including an automatic fountain heater control with said control connected in the electric feed line ahead of and remote from said fountain heater, said automatic control comprising an enclosure, an electric heating element and a thermostatically controlled switch disposed within said enclosure, thereby providing a heated enclosure relative to said fountain heater.

2. In combination, a drinking fountain: a molded solid mass of yieldable waterproof dielectric material yieldably removably conformably engaging partly around a part of said fountain; and a heating coil molded within said mass.

3. In combination, a drinking fountain comprising a container and a water supply pipe extending from the container; a molded solid mass of yieldable waterproof dielectric material having a thick approximately tubular housing yieldably embracing the pipe and having a narrow opening from end to end on one side of the housing, an extension at the side remote from said opening conformally engaging said container; and a conducting electric resistor heating coil molded within said mass substantially throughout said mass, and having end portions molded in and extending out through said extension.

4. A heater for a drinking fountain comprising a bowl-shaped container and a water supply pipe extending downwardly from and coaxial with the container; said heater comprising a molded mass of yieldable waterproof dielectric material having an upright lower thick approximately tubular housing yieldably releasably embracing the pipe and having a narrow opening of less than 90 degrees and extending

from top to bottom on one side, and an upper extension at the side remote from said opening and conformally engaging said bowl; and a conducting electric resistor heating coil molded within said mass substantially throughout said housing, and having end portions molded in and extending out through said extension.

5. A drinking fountain heater for a housing comprising a bowl-shaped container and a water supply pipe extending downwardly from and coaxial with the container, said heater comprising a molded solid mass of yieldable waterproof dielectric material having an upright lower thick approximately tubular housing body adapted yieldably to fit and yieldably embrace the pipe and having a vertical opening from top to bottom on one side of the housing body, said body being yieldable to open said opening enough to place the body on the pipe or remove it, and an upper lateral extension at the side remote from said opening adapted to conformally engage said container; and a conducting electric resistor heating coil molded within said mass substantially throughout said body, and having end connecting portions molded in and extending out through said extension.

6. In combination, a plurality of drinking fountains; a thermostat; housings enclosing said thermostat and a portion of each fountain; the thermostat housing being remote from the fountains; a heater in each housing; and means controlled by the thermostat for controlling all of the heaters.

7. In combination, a plurality of drinking fountains; a thermostat; housings of similar heat-insulating effect respectively substantially enclosing said thermostat and a portion of each fountain; the thermostat housing being separated from all fountains and dampness; a heater in each housing; and means controlled by the thermostat for controlling all of the heaters similarly.

8. In combination, a plurality of drinking fountains; housings respectively substantially enclosing a portion of each fountain; a control housing in a dry location higher than and remote from the fountains and the dampness thereof; a heater in each housing; and means controlled by the heat in the control housing for controlling the fountains.

9. In combination, a plurality of drinking fountains and water feed pipes therefor; a thermostat housing; a thermostat and pilot lamp heater therein; molded housings of dielectric material respectively substantially enclosing portions of each fountain and feed pipe; the thermostat housing being separated and remote from all fountains and fountain housings; a resistance heater unit cast in each fountain housing; a source of current; conductors connected to said source; said pilot lamp heater and said unit heaters being connected in parallel between said conductors; and a switch interposed in one of the conductors between the heaters and the source and operatively connected to and controlled by the thermostat to control said current to reduce the heat of the heaters when the temperature in the housings reaches a predetermined degree.

10. In combination a plurality of drinking fountains, each drinking fountain comprising a container and a water supply pipe extending from the container, a heater associated with each fountain comprising a heater housing consisting of a molded solid mass of waterproof

dielectric material having a thick approximately tubular housing portion adapted yieldably to embrace the pipe and having a narrow opening from end to end of one side, and an extension adapted to conformally engage said container, a conducting electric resistor heating coil molded within said mass substantially throughout a major portion of said mass and having end portions molded in and extending out through said mass; a thermostat housing; a thermostat and a heater therein; said thermostat housing and heater housing being dissimilar in form but of similar heat-insulating effect, the thermostat housing being separated and remote from all fountains; a source of current; conductors connecting to said source; said heaters being connected in parallel between said conductors; and a switch interposed in one of the conductors between the source and heaters and operatively connected to and controlled by the thermostat for opening said switch when a predetermined temperature is reached in the thermostat housing for controlling all of the heaters similarly.

11. In combination, a fountain, an electric fountain heater and including an electric fountain heater control with said control connected in the electric feed line ahead of and remote from said fountain heater, said automatic control comprising an enclosure remote from the fountain, an electric heating element and a thermostatically controlled switch disposed within said enclosure, thereby providing a heated enclosure relative to said fountain heater.

12. In combination, an electric fountain heater, said heater comprising a resistor coil formed and molded within a yieldable enclosure with said enclosure formed to fit substantially around a portion of the water supply pipe and extending upward and outward in contact with a portion of the lower part of the fountain; and including an automatic fountain heater control with said control connected in the electric feed line ahead of and remote from said fountain heater, said automatic control comprising an enclosure, an electric heating element and a thermostatically controlled switch disposed within said enclosure, thereby providing a heated enclosure relative to said fountain heater.

13. In combination, a fountain, an electric fountain heater adjacent thereto and including an automatic fountain heater control with said control connected in the electric feed line ahead of and remote from said fountain heater, said automatic control comprising an enclosure remote from the fountain, an electric heating element, and a thermostatically controlled switch disposed within said enclosure, thereby providing a heated enclosure relative to said fountain heater.

14. In combination, a fountain; and an electric fountain heater, said heater comprising a resistor coil formed and molded within a yieldable enclosure with said enclosure formed to fit substantially around a portion of the water supply pipe and extending upward and outward in contact with a portion of the lower part of said fountain.

15. In combination, a fountain; and an electric fountain heater of yieldable material formed to fit partly around and removably embrace the water supply pipe and extending upward and outward in contact with a portion of the lower part of said fountain.

7

16. An automatic fountain heater control for a fountain heater of a fountain with said control connected in the electric feed line ahead of and remote from said fountain heater, said automatic control comprising an enclosure remote from the fountain, an electric heating element and a thermostatically controlled switch disposed within said enclosure thereby providing a heated enclosure relative to said fountain heater.

17. An automatic fountain heater control as in claim 16 with said enclosure provided with an observation window and with said heating element comprising a pilot light bulb.

18. An automatic fountain heater control as in claim 16 with said enclosure provided with an opening adapted for temperature communication between the inside and outside of said enclosure and with means for closing said opening.

19. An automatic fountain heater control as in claim 16 with said thermostatically controlled switch comprising a thermostat disposed within a yieldable frame with one side of said frame secured to said enclosure and with one side of said thermostat secured to one side of said frame and with the opposite side of said thermostat provided with a bolt which passes freely through the opposite side of said frame and provided with an adjusting nut, a normally closed switch is secured to the fixed end of said frame in a manner whereby the free end of said frame is in contact with the actuating pin of said switch and whereby said switch is normally held in open position by the tension of said frame and whereby said switch is allowed to actuate itself into normally closed position by the cooling of said thermostat within said frame and the relief of said tension from said actuating pin.

20. A thermostatically controlled switch comprising a thermostat disposed within a yieldable frame with one side of said thermostat secured to one side of said frame and with the opposite side of said thermostat provided with a bolt which passes freely through the opposite side of said frame and provided with an adjusting nut, a normally closed switch secured to one end of said frame in a manner whereby the free end of said frame is in contact with the actuating pin of said switch and whereby said switch is normally held in open position by the tension of said frame and whereby said switch is allowed to actuate itself into normally closed position by the cooling of said thermostat within said frame and the relief of said tension from said actuating pin.

21. A heater control for fountain heaters said control comprising a pilot heater; a pair of members biased apart; a thermostat adjacent to the pilot heater and loosely connected between said members and adapted to draw said members toward each other when the thermostat contracts; a switch adapted to be controlled by one of said members; and electric means controlled by said switch for controlling said heaters similarly.

22. A heater control for electric feed lines from a current source to fountain heaters, said control comprising a pilot heater fed by said lines; a yielding frame having opposite sides biased apart; a thermostat adjacent the pilot heater and loosely connected between said sides and adapted to draw said sides together when the thermostat contracts; and a normally closed switch in one of said lines between the source and heaters and adapted to be opened by one of said sides when the thermostat is expanded.

8

23. An automatic fountain heater control adapted to be connected to electric feed lines connected to a source of current and between which lines fountain heaters are connected; said automatic control comprising an enclosure; an electric heating element in said enclosure connected between said lines; a yielding frame secured within the enclosure and having relatively yieldable opposite sides biased away from each other; a thermostat disposed within said frame having one side of said thermostat secured to one of said opposite sides; the other side of the thermostat carrying a member adapted to engage the outer face of said other side, to draw said sides toward each other when the thermostat contracts and to allow the thermostat to expand in warm weather more than the frame sides move apart; a normally closed switch in one of said lines said source and said element and heaters and adapted to be opened by one of said sides when the sides are biased away from each other when the thermostat is expanded.

24. An automatic fountain heater control adapted to be connected to electric feed lines connected to a source of current and between which fountain heaters are connected, said automatic control comprising an enclosure; an electric heating element in said enclosure connected between said lines; a yielding frame within the enclosure having a fixed end secured to said enclosure and having adjacent to the fixed frame relatively yieldable opposite sides biased away from each other and respectively secured to and movable relative to the fixed end; a thermostat assembly comprising superposed wafer thermostats disposed within said frame having an outer side of one thermostat secured to one of said opposite sides; the other opposite side of the frame having an opening therein; a bolt secured to the outer side of the other thermostat and passing freely through said opening and provided with an adjusting nut exterior to the frame and adapted to engage the outer face of said other side to draw said sides toward each other when the thermostat contracts; a normally closed switch in one of said lines between the source and said element and heaters and biased to closed position and secured to the fixed end of said frame and adapted to be operatively connected to and opened by the movable side, whereby said switch is held in open position by the biased tension of said frame when the thermostat is expanded, and whereby when the cooling of said thermostat contracts the assembly and draws said sides together, the switch is biased to closed position.

25. An automatic fountain heater control connected in the electric feed line ahead of and remote from a fountain heater, said automatic control comprising an enclosure, an electric heating element and a normally closed switch disposed within said enclosure; a yieldable frame within the enclosure having opposite sides biased apart by the tension of the frame; said frame having a free end and having one side fixed to said enclosure; a thermostat disposed within said frame having one side secured to one side of said frame; the opposite side of the frame being provided with an opening; the opposite side of said thermostat being provided with a bolt passing freely through the opening; an adjusting nut on the bolt and adapted to engage the outer face of the adjacent side of the frame; said switch being secured to the fixed side of the frame and having an actuating pin adapted to be pushed by said free end; and whereby said switch is normally held in open

position by the tension of said frame; and whereby said switch is allowed to actuate itself into normally closed position by the cooling of said thermostat within said frame and release of said tension from said actuating pin, and whereby on further cooling said free end leaves the pin.

26. An automatic fountain heater control with said control connected in the electric feed line ahead of and remote from a fountain heater, said automatic control comprising an enclosure, an electric heating element and a thermostatically controlled switch disposed within said enclosure thereby providing a heated enclosure relative to said fountain heater, said thermostatically controlled switch comprising a thermostat disposed within a yieldable frame with one side of said frame secured to said enclosure and with one side of said thermostat secured to one side of said frame and with the opposite side of said thermostat provided with a bolt which passes freely through the opposite side of said frame and provided with an adjusting nut, a normally closed switch is secured to the fixed end of said frame in a manner whereby the free end of said frame is in contact with the actuating pin of said switch and whereby said switch is normally held in open position by the tension of said frame, and whereby said switch is allowed to actuate into normally closed position by the cooling of said thermostat within said frame and the release of said tension from said actuating pin.

27. In combination, a drinking fountain; a heater for the fountain; the heater and fountain and the water therein being adapted to be subject to changeable weather temperature adapted to go above and below freezing, a thermostat separated from and remote from the fountain, a pilot heater adapted to heat the thermostat; the pilot heater and thermostat therein being subject to substantially said same changeable weather temperature; and means controlled by the thermostat for controlling all of the heaters.

28. In combination, a plurality of drinking fountains; a heater for each fountain; each heater, each fountain and the water therein being adapted to be subject to changeable weather temperature adapted to go above and much below freezing, a thermostat housing separated from and remote from the fountain, a thermostat in the housing sensitive while therein to said weather temperature; a pilot heater in the housing adapted to heat the thermostat; the housing being so constructed and located that the interior thereof, the pilot heater and thermostat therein are subject to substantially proportional weather temperature as said fountains, and means controlled by the thermostat for controlling all of the heaters similarly.

29. In combination, a plurality of drinking fountains; a heater for each fountain; each heater, each fountain and the water therein being adapted to be subject to changeable weather temperature adapted to go above and below freezing, a thermostat housing separated from and remote from the fountain, a thermostat in the housing; a pilot heater in the housing adapted to heat the thermostat; the housing having an adjustable opening therein and being so constructed and so located relative to the fountain that the pilot heater and thermostat therein are subject to substantially proportional weather temperatures as said fountains; and means controlled by the thermostat for controlling all of the heaters similarly.

30. In combination, a plurality of drinking

fountains; a heater for each fountain; each heater, each fountain and the water therein being in a location to subject them to changeable weather temperature adapted to go above and much below freezing, a thermostat housing separated from and remote from the fountain; a thermostat in the housing; a pilot heater in the housing adapted to heat the thermostat; the housing being so constructed and so located relative to the fountains that the pilot heater and thermostat therein are subject to, and said thermostat is sensitive to, substantially said same changeable weather temperature; and means controlled by the thermostat for controlling all of the heaters similarly; said thermostat being adjusted to overcome said weather temperature and maintain the water at a suitable drinking temperature when said weather temperature goes somewhat above or below freezing.

31. In combination, a plurality of drinking fountains; a heater for each fountain; each heater, each fountain and the water therein being adapted to be subject to changeable weather temperature adapted to go above and much below freezing, a thermostat housing separated from and remote from the fountain; a thermostat in the housing; a pilot heater in the housing adapted to heat the thermostat; the housing having an opening therein and being so constructed and so near to the fountains that the pilot heater, the thermostat therein and the interior of the housing are subject to substantially said same changeable weather temperature to which the fountains are subjected; and means controlled by the thermostat for controlling all of the heaters similarly; said thermostat being sensitive to and set to be operated by said same weather temperature to maintain the water in the fountain at suitable drinking temperature when said weather temperature goes to or much below freezing.

32. In combination, a plurality of drinking fountains adapted to be subjected to changeable temperature adapted to go above or below freezing; a partially heat-insulated electric heater associated with each fountain to prevent freezing of water therein; a thermostat housing separated and remote from the fountains and having an opening therein and near enough to the fountains for the housing to be subject to said same changeable temperatures; a thermostat and a heater therein said thermostat housing and heater having similar heat-insulating effect; a source of current; conductors connecting to said source; said heaters being connected in parallel between said conductors; and a switch interposed in one of the conductors between the source and heaters and operatively connected to and controlled by the thermostat for opening said switch when a predetermined temperature is reached in the thermostat housing for controlling all of the heaters similarly.

33. In combination, a plurality of drinking fountains, each drinking fountain comprising a container and a water supply pipe extending from the container, a heater housing associated with each fountain; a heater in each housing; a thermostat housing; a thermostat and a heater therein; said thermostat housing and heater housing being dissimilar in form but of similar heat-insulating effect, the thermostat housing being separated and remote from all fountains; a source of current; conductors connecting to said source; said heaters being connected in parallel between said conductors; and a switch interposed in one

of the conductors between the source and heaters and operatively connected to and controlled by the thermostat for opening said switch when a predetermined temperature is reached in the thermostat housing for controlling all of the heaters similarly.

34. In combination, a drinking fountain comprising a bowl-shaped container and a water supply pipe extending downwardly from and coaxial with the container; and a heater comprising a molded one-piece solid mass of yieldable plastic waterproof rubber-like dielectric material having an upright lower thick approximately tubular housing body yieldably embracing the pipe and having a vertical opening from top to bottom on one side of the housing body to allow the body to be removed from or placed on the pipe, and an upper lateral extension at the side remote from said opening conformally engaging said bowl and extending to near the outer periphery of the bowl, and a conducting electric resistor heating coil molded within said mass substantially throughout said body between the outer

and inner faces thereof, and having end connecting portions molded in and extending out through said extension between the upper and lower faces thereof; said one-piece mass serving the quadruple function of insuring good conductive contact with the pipe and bowl, supporting and insulating the coil, yieldably releasably embracing the pipe and supporting the heater.

EARL B. JOHNSON.

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