April 9, 1929. R. C. KERLAOUEZO ET AL 1,708,580

HEATING SYSTEM

Filed Sept. 17, 1927 2 Sheets-Sheet 1

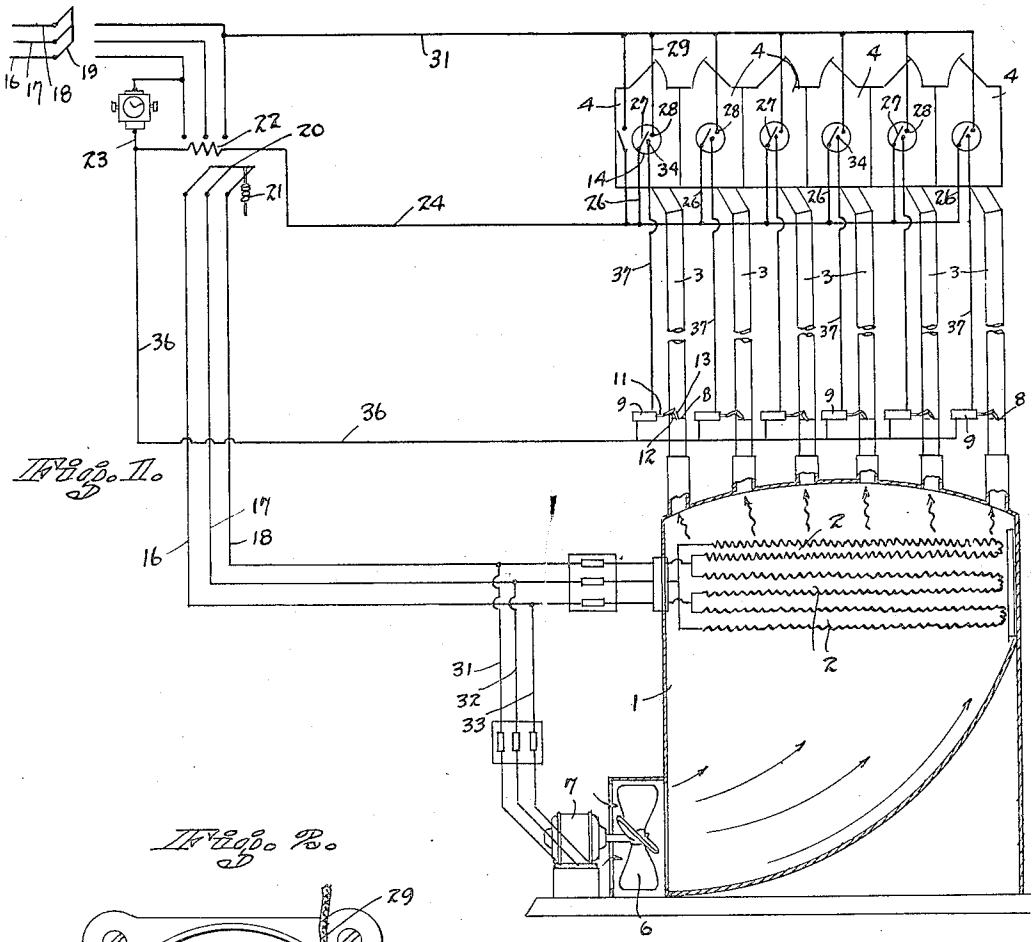

Fig. 1.

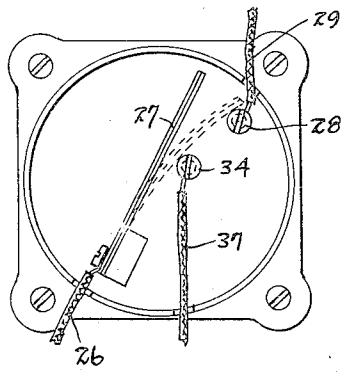

Fig. 2.

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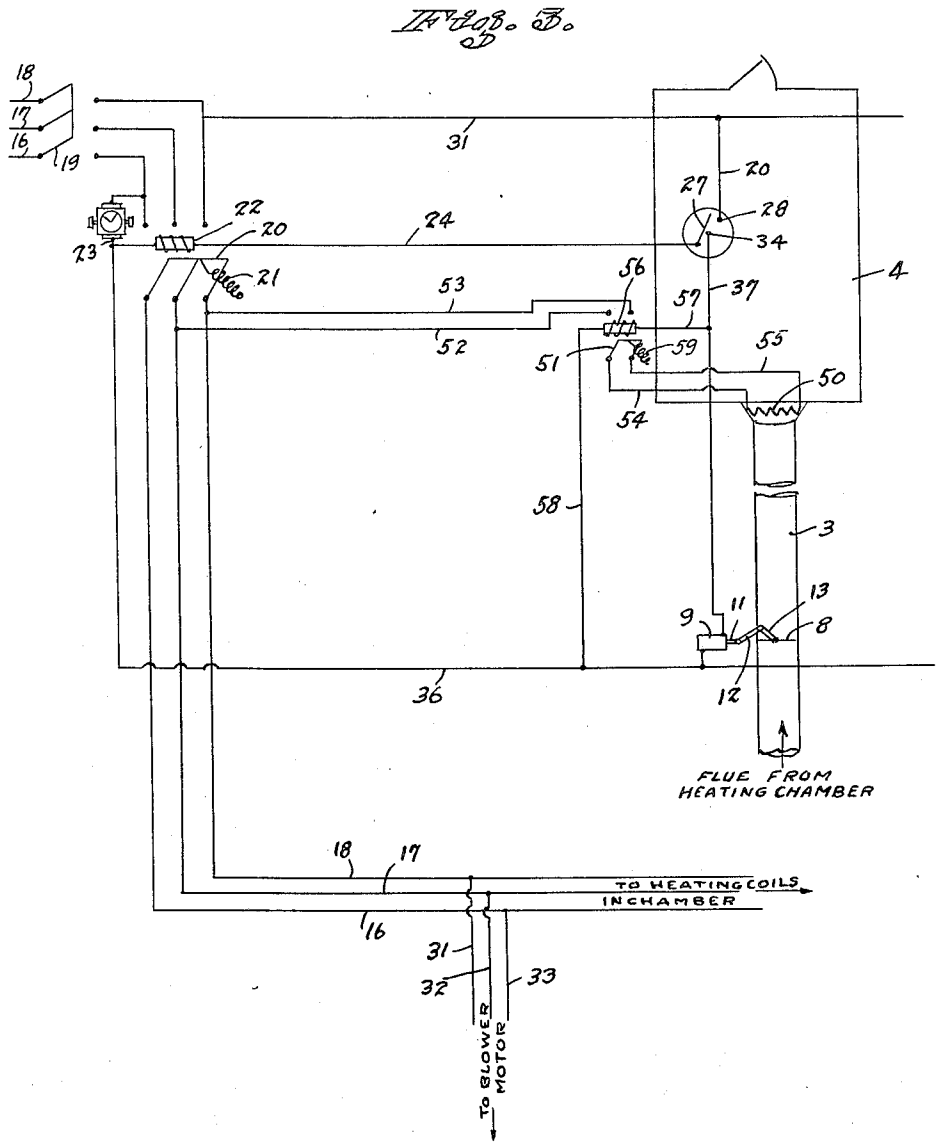

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UNITED STATES PATENT OFFICE.

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HEATING SYSTEM.

Application filed September 17, 1927. Serial No. 220,216.

The present invention relates to improvements in heating systems for houses and has for its particular object to provide electrically operated means whereby the various rooms of a house may be quickly and individually heated to a certain temperature while means are provided for regulating the heat so that the heating system is automatically shut off relative to each individual room, the temperature of which has reached a predetermined degree.

It is particularly proposed to use for this purpose a forced draft of heated air which is adapted to heat the room very quickly so that only a short time is required for the heating means to be active. We have found by actual experience that rooms may be heated much more economically in this manner than they can by the application of constant heat and in fact we have proven that our manner of heating reduces the cost of electric heating to that of any other heating means ordinarily available, even when the cost of electric current is comparatively high.

Other and further objects and advantages of our invention will appear as the specification proceeds.

The preferred form of our invention is illustrated in the accompanying drawing, in which

Figure 1 shows a general diagrammatic view explaining our heating system;

Figure 2 a detail view of a heat responsive switch used in connection therewith, and

Figure 3 is a wiring diagram of a modified form of the device.

While we have shown only the preferred form of our invention we wish to have it understood that various changes or modifications may be made within the scope of the claims hereto attached without departing from the spirit of the invention.

In its preferred form our invention comprises a heating chamber 1 serving as a furnace and preferably comprising a cylinder having a plurality of electric heating elements 2 assembled therein in such a manner that a draft may be directed through the barrel to flow past the heating elements into a number of flues leading to different rooms of a house, roughly indicated at 4. The heating chamber 1 which in its function compares with the furnace now ordinarily used, is preferably placed in the basement of a house. A fan 6 is mounted relative to the wall of the heating chamber to blow a draft through the same in the manner previously described, and a motor 7 is mounted adjacent the fan for driving the same. Each of the flues 3 is provided with a damper 8 controlling the port area of the flue and the damper may be operated by means of a solenoid 9, the plunger 11 of which operates through a link 12, and an arm 13 associated with the damper.

A heat responsive control 14 is provided in each individual room and is associated with the solenoid 9 in such a manner as to operate the damper at predetermined temperatures. The heat responsive element is formed in such a manner as to also control the heating means and the motor 7, as will be more easily understood by reference to the wiring diagram. In the latter it is assumed that the motor and the heating elements are operated by means of a three-phase system, while the solenoid is operated by a single-phase.

The three main wires 16, 17 and 18 are controlled by a manually operated switch 19 which renders the entire system either active or inactive. A second switch 20 is provided in the three wires which is normally held open by means of a spring 21 and which may be closed by means of an electromagnet 22 of a circuit comprising the wire 16, the wires 23, 24 and 26, the heat responsive element 27 of the thermostat 14, the contact 28, and the wires 29 and 31. It will be noted that the switch 20 closes when the temperature in any one of the rooms containing a thermostat drops below a predetermined temperature, so that the heat responsive element 27 makes contact with the stationary contact 28. The closing of the switch 20 carries the current through the wires 16, 17 and 18 to the heating elements 2 and through wires 31, 32 and 33 to the motor 7.

When the heat responsive element 27 engages the contact 28 it also engages a second contact 34 and thereby closes a circuit comprising the wires 16, 23 and 36, the solenoid 9, the wire 37, the heat responsive element 27, the contacts 34 and 28, and the wires 29 and 31, so that the solenoid is energized and opens the flue to full capacity. It will be noted from this arrangement that whenever the heat responsive element 27 moves toward the contacts 28 and 34 in any one of the rooms the heater and the motor 7 are rendered active,

while at the same time the damper or shutter is opened in the flue leading to that particular room, while all the other dampers or shutters remain closed. When therefore the temperature in a single room falls below that desired the entire blast is rendered active and directed toward that single room without affecting the other rooms, thus causing the temperature in the individual room to rise almost immediately to a desired degree. As long as all the rooms maintain a desired temperature the motor and the heater are automatically rendered inactive, and the shutters close automatically.

The entire system is rendered inoperative by the opening of the switch 19.

It should be understood that while in the present application our invention has been described as a heating system, the outstanding features thereof may be equally well used in connection with a cooling system, in which case cooling coils might be substituted for the heater or mere circulation of air be relied on for producing the described effect. It should further be noted that the inventor does not depend upon any particular kind of electricity, such as three-phase nor on any particular wiring circuit.

In Figure 3 we show a form of the device somewhat similar to the form shown in Figure 1, but which in addition provides a heating element 50 that is positioned adjacent to the outlet opening of the flue 3. This element is connected by means of a switch 51 to the current flowing through wires 17 and 18. Wires 52 and 53 are tapped to the wires 17 and 18 and are connected to wires 54 and 55 when the switch 51 is closed.

The switch 51 is magnetically controlled by means of a magnet 56 which is connected by a wire 57 to the wire 37 and by a wire 58 to the wire 36. When the thermostat 27 closes it will cause a current to flow through the magnet 56 which, in turn, closes the switch 51. A current will now flow through the heating element 50 and will warm the air just prior to its entrance into the room 4. We have found that in tall buildings the air flowing through flues extending from the basement to, say, the twenty-third story, will become cool before reaching the room in question on the twenty-third floor. In order to overcome this we provide heating elements at the exhaust ends of the flues, although the fan is positioned at the entrance of the flues. If desired, a combination of heating members in the basement and additional heating members at the exhaust ends of each flue may be used. The switch 51 is opened by a spring 59 when the magnet 56 is de-energized.

We claim:

1. In a heating system for a house, a flue leading to a room thereof, means controlling the port area of the flue, means for blowing air therethrough into the room, means for heating the air and temperature-responsive means controlling the said three means.

2. In a heating system for a house, a plurality of flues, leading to the different rooms thereof, means for controlling the port area of each flue, means for blowing air through the flues into the rooms, means for heating the air and temperature-responsive means in each room controlling the blowing means and the heating means and the port area of the flue leading to the particular room.

3. In a device of the type described, a blower fan, flues extending from said fan to various rooms in the building, heating elements disposed at the exhaust ends of said flues, and thermostatically controlled means for controlling the current through said heating elements.

4. A device of the type described comprising flues for conducting air into rooms, heating elements disposed at the exhaust ends of said flues and thermostats disposed in each room and being electrically connected with said heating elements.

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