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R. BURKLE

1,911,747

INSTANTANEOUS ROOM HEATER

Filed May 2, 1932

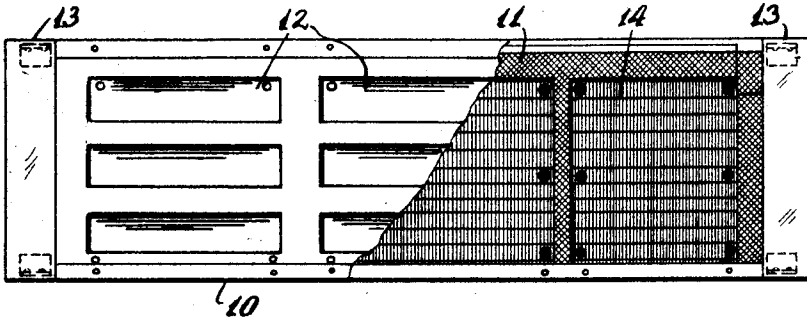


Fig. 1.

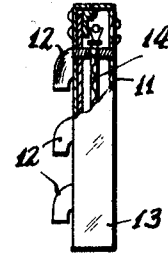


Fig. 2.

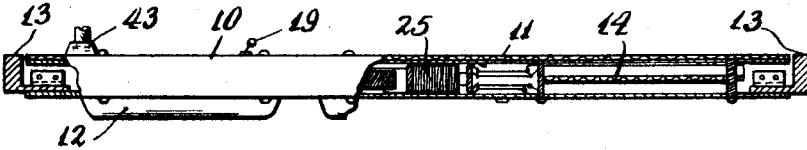


Fig. 3.

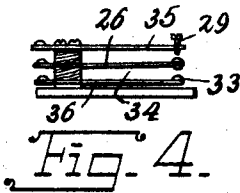


Fig. 4.

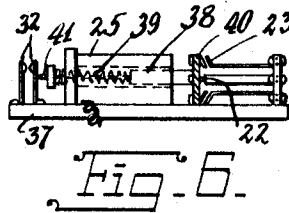


Fig. 6.

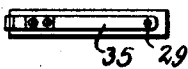


Fig. 5.

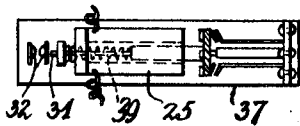


Fig. 7.

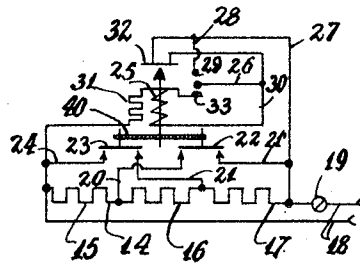


Fig. 8.

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UNITED STATES PATENT OFFICE

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INSTANTANEOUS ROOM HEATER

Application filed May 2, 1932. Serial No. 608,760.

This invention relates to new and useful improvements in an instantaneous room heater.

The invention has for an object the construction of a heater mentioned which is characterized by the ability of instantaneously heating up from room temperature to a pre-determined temperature and thereafter maintaining said temperature.

This arrangement adapts the device very nicely for use in private homes, offices and premises having windows and requiring immediate heating.

Furthermore, the invention also proposes to adapt the heater for insertion between jamb of the bottom edge of a window sash and extendable into the guide strips of the sash to provide simultaneous ventilation and heating.

The invention further proposes the construction of a device of the class described which is of simple, durable construction, dependable in use and efficient in operation and which can be manufactured and sold at a reasonable cost.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawing, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawing forming a material part of this disclosure:—

Fig. 1 is a sectional elevational view of a device constructed according to this invention, partially broken away to disclose interior parts.

Fig. 2 is an end elevational view of Fig. 1, partially broken away to disclose interior parts.

Fig. 3 is a top plan view of Fig. 1 partially broken away to disclose interior parts.

Fig. 4 is a side elevational view of a thermostat used in the device.

Fig. 5 is a top plan view of Fig. 4.

Fig. 6 is a side elevational view of a relay used in the device.

Fig. 7 is a top plan view of Fig. 6.

Fig. 8 is a schematic wiring diagram of the device.

The heater, according to this invention, comprises a casing 10 which is substantially of rectangular form and open on the inner side. A screen 11 is engaged over the open inner side to close it without restricting the passage of air. The outer side of the casing 10 has a plurality of openings formed by inverted punched out pockets 12. Extension and slides 13 are mounted upon the ends of the casing 10 to adapt the casing for insertion between the sash guide strips of a window frame. The end slides are adjustably mounted so that they may be slightly extended when the device is placed in position. A heating element 14 is mounted within the casing 10 and is connected with a means for causing rapid heating when the device is first turned on and subsequent controlling the heating to maintain a pre-determined temperature.

The heating element 14 is divided into three sections indicated in Fig. 8 by reference numerals 15, 16 and 17. A low temperature circuit is provided which includes the power lead 18, a switch 19 and the heating sections 15, 16 and 17 all connected in series.

High temperature circuits are provided to cause instantaneous heating up to the desired temperature as shown in the drawing, three of these circuits have been shown, one for each of the heating sections of the heating element 14. While just three heating sections have been disclosed this is not intended as a limitation since the invention can be applied to a different number. The high temperature circuits include taps 20 and 21 connected with the ends of the heating sections 15, 16 and 17. These taps are connected in a manner so that the heating sections are connected in parallel and include a relay switch for their operation.

One of the high temperature circuits may be traced from the tap 21' connected with one of the leads 18 and passing through relay switch 22 and thence through tap 20, the winding 15 and third lead 18. Another one of the high temperature circuits may be traced from one of the leads 18 to the lead 21' through relay switch 22, the tap 20, the

heating section 16, the tap 21, another relay switch 23, a lead 24, and back to the lead 18. The third high temperature circuit may be traced from one of the leads 18 through the heating element 17, the tap 21, the relay 23, the lead 24 and finally the lead 18.

The relay switches 22 and 23 are connected for unitary operation and have a common coil 25 to cause the operation. A shunt circuit is provided across the heating element 14 and includes a two pole thermo switch 26. This shunt circuit may be traced from one of the leads 18 to the lead 27, a lead 28, contact 29 through the switch 26 when the switch is hot, then along lead 30 through the coil 25, through a resistance 31, and back to the other lead 18.

A short circuiting circuit is provided for short circuiting the coil 25 and is arranged across the heating element 14. This short circuiting circuit includes a switch 32 connected with the relay which operates the switches 22 and 23. The short circuiting circuit may be traced from one of the leads 18 along lead 27 through the switch 32 when the latter is closed to the thermo switch 26 and thence to the contact 33 when the thermo switch is cold, then along the resistor 31 and finally to the other lead 18.

The thermo switch 26 is shown in detail in Figs. 4 and 5 and is shown to comprise a bi-metal arm 34 located between arms 35 and 36 respectively carrying the contacts 29 and 33. The contact 29 is in the form of a screw adjustable so as to control within certain limits the time of operation of the switch. Each of the arms are insulated from each other. Further details of the switch is thought not necessary since such switches are generally known.

The relay switch is shown in detail in Figs. 6 and 7. It is shown to comprise a base 37 supporting the coil 25 through which a core 38 is mounted. This core is tensioned by a spring 39 offset A. C. hum. On one end of the core 38 an insulation plate 40 is mounted which carry the switches 22 and 23 respectively engageable against suitable contacts. At the front end the core 38 is provided with a stem 41 adapted to engage and close the switch 32 as the core moves frontwards to open the switches 22 and 23. A plug 43 is mounted upon the front of the casing 10 and is connected with the leads 18 so that a complimentary plug element may be engaged thereon for connecting the device with a source of current. The switch 19 is also shown mounted upon the front of the casing 10 so that the device may be conveniently operated.

The operation of the device may be traced by assuming it cold in which condition the thermo switch 26 will be resting against the contact 33 and the relay closed so that the

switches 22 and 23 are closed and the switch 32 open. To set the device in operation the switch 19 should be closed. The current then flows through the heating sections 15, 16 and 17 in parallel to cause them to heat up very rapidly, in fact, nearly instantaneously. The parallel connection of the heat sections is accomplished by the high temperature circuits traced before. When the proper temperature is reached the thermo switch 26 will move so as to close the circuit at the contact 29 which immediately sets the shunt circuit into operation and causes the energization of the coil 25 of the relay. Then the relay functions to open the switches 22 and 23 and simultaneously closes the switch 32. When the switches 22 and 23 are open the high temperature circuits are interrupted and the current is now forced to flow the heating elements 15, 16, and 17 in series.

The temperature will slowly fall and the thermo switch 26 will move away from the contact 29 but the relay will remain in its positions since the circuit is closed through the switch 32 and the coil 25 consequently energized. When the thermo switch 26 makes contact with the contact 33 the coil 25 will be short circuited so that the relay moves back into its original position wherein the switches 22 and 23 are closed and the switch 32 open. The heating sections are now connected in multiple and causes additional heating which will cause the thermo switch 26 to start moving towards the contact 29. In this manner, the device continues to function during its operation.

Air entering through the pockets 12 passes through the heated atmosphere within the casing 10 and discharges thru screen 11. The heating element 14 may be of any design and construction generally known. A baffle plate may be attached upon the back of the casing 10 to direct or deflect the heat current as desired. Preferably, the screen 11 should be secured in place by thumb screws, not shown on the drawing, so that it may be easily removed for servicing the device. As a modified construction the relay may be omitted and merely a single heating element used instead.

While I have shown and described the preferred embodiment of my invention, it is to be understood that I do not limit myself to the precise construction herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:—

1. An instantaneous room heater, comprising an adjustable casing adapted to be placed between the jamb and bottom of a raised window sash and at the sides between the sash guide strips on the frame of the window,

said casing being closed at the outside and formed with a plurality of shielded openings, a screen attached upon the inside of said casing, a heating element mounted within the casing, means for causing rapid heating of said element when the device is initially turned on, and means for controlling the heating element to maintain a temperature substantially constant within certain limits, said openings in the outside of said casing comprising inverted pockets stamped therefrom.

2. An instantaneous room heater, comprising an adjustable casing adapted to be placed between the jamb and bottom of a raised window sash and at the sides between the sash guide strips on the frame of the window, said casing being closed at the outside and formed with a plurality of shielded openings, a screen attached upon the inside of said casing, a heating element mounted within the casing, means for causing rapid heating of said element when the device is initially turned on, and means for controlling the heating element to maintain a temperature substantially constant within certain limits, said adjustable casing comprising a main portion and end adjustment slides extendable.

3. In a device of the class described, a low temperature circuit including heating element having a plurality of sections connected in series, high temperature circuits including taps connected between the ends of said heating sections and connecting these sections in parallel and a relay switch in each of these circuits, a shunt circuit across said heating element and including a two pole thermo switch normally open at one pole and closed at the other pole to short circuit the coil of said relay, and a short circuiting circuit across said heating element and including a switch connected with the relay to close as the relay opens, and said thermo switch being engageable against its other pole to include the coil of said relay.

4. In a device of the class described, a low temperature circuit including heating element having a plurality of sections connected in series, high temperature circuits including taps connected between the ends of said heating section and connecting these sections in parallel and a relay switch in each of these circuits, a shunt circuit across said heating element and including a two pole thermo switch normally open at one pole and closed at the other pole to short circuit the coil of said relay, and a short circuiting circuit across said heating element and including a switch connected with the relay to close as the relay opens, and said thermo switch being engageable against its other pole to include the coil of said relay, said circuits being connected with a force of power, and a switch being interposed for turning the device off and on.

5. An instantaneous room heater, comprising

an adjustable casing adapted to be placed between the jamb and bottom of a raised window sash and at the side between the sash guide strips on the frame of the window, said casing being closed at the outside and formed with a plurality of shielded openings, a screen attached upon the inside of said casing, a heating element mounted within the casing, means causing rapid heating of said element when the device is initially turned on, and means for controlling the heating element to maintain a temperature substantially constant within certain limits, said two latter means comprising a low temperature circuit including heating element having a plurality of sections connected in series, high temperature circuits including taps connected between the ends of said heating sections and connecting these sections in parallel and a relay switch in each of these circuits, a shunt circuit across said heating element and including a two pole thermo switch normally open at one pole and closed at the other pole to short circuit the coil of said relay, and a short circuiting circuit across said heating element and including a switch connected with the relay to close as the relay opens, and said thermo switch being engageable against its other pole to include the coil of said relay.

6. An instantaneous room heater, comprising an adjustable casing adapted to be placed between the jamb and bottom of a raised window sash and at the sides between the sash guide strips on the frame of the window, said casing being closed at the outside and formed with a plurality of shielded openings, a screen attached upon the inside of said casing, a heating element mounted within the casing, means for causing rapid heating of said element when the device is initially turned on, and means for controlling the heating element to maintain a temperature substantially constant within certain limits, said two latter means comprising a low temperature circuit including a heating element having a plurality of sections connected in series, high temperature circuits including taps connected between the ends of said heating sections and connecting these sections in parallel and a relay switch in each of these circuits, a shunt circuit across said heating element and including a two pole thermo switch normally open at one pole and closed at the other pole to short circuit the coil of said relay, and a short circuiting circuit across said heating element and including a switch connected with the relay to close as the relay opens, and said thermo switch being engageable against its other pole to include the coil of said relay, a resistor being included within said short circuiting circuit.

7. An instantaneous room heater, comprising an adjustable casing adapted to be placed

	window sash and at the sides between the sash guide strips on the frame of the window, said casing being closed at the outside and formed with a plurality of shielded openings, a screen attached upon the inside of said casing, a heating element mounted within the casing, means for causing rapid heating of said element when the device is initially turned on, and means for controlling the heating element to maintain a temperature substantially constant within certain limits, said two latter means comprising a low temperature circuit including heating element having a plurality of sections connected in series, high temperature circuits including taps connected between the ends of said heating sections and connecting these sections in parallel and a relay switch in each of these circuits, a shunt circuit across said heating element and including a two pole thermo switch normally open at one pole and closed at the other pole to short circuit the coil of said relay, and a short circuiting circuit across said heating element and including a switch connected with the relay to close as the relay opens, and said thermo switch being engageable against its other pole to include the coil of said relay, said relay having a single core and separate switches each included in said high temperature circuits.	simultaneous with the opening of the switches in said high temperature circuits. In testimony whereof I have affixed my signature.	
5		ROBERT BURKLE.	70
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15			80
20			85
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35	8. An instantaneous room heater, comprising an adjustable casing adapted to be placed between the jamb and bottom of a raised window sash and at the sides between the sash guide strips on the frame of the window, said casing being closed at the outside and formed with a plurality of shielded openings, a screen attached upon the inside of said casing, a heating element mounted within the casing, means for causing rapid heating of said element when the device is initially turned on, and means for controlling the heating element to maintain a temperature substantially constant within certain limits, said two latter means comprising a low temperature circuit including heating element having a plurality of sections connected in series, high temperature circuits including taps connected between the ends of said heating sections and connecting these sections in parallel and a relay switch in each of these circuits, a shunt circuit across said heating element and including a two pole thermo switch normally open at one pole and closed at the other pole to short circuit the coil of said relay, and a short circuiting circuit across said heating element and including a switch connected with the relay to close as the relay opens, and said thermo switch being engageable against its other pole to include the coil of said relay, said relay having a single core and separate switches each included in said high temperature circuits, the core of said relay being engageable to close the switch in said short circuiting circuit		100
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