Dec. 2, 1924. 1,517,833

R. GERTLER ET AL

WINDOWPANE HEATER

Filed Dec. 15, 1922 2 Sheets-Sheet 1

Fig. 1.

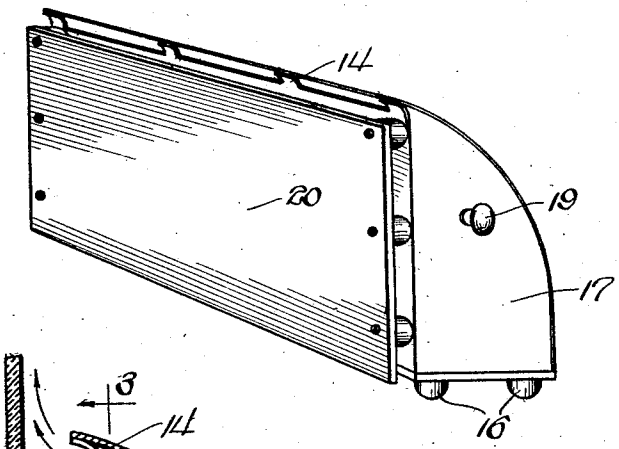


Fig. 5.

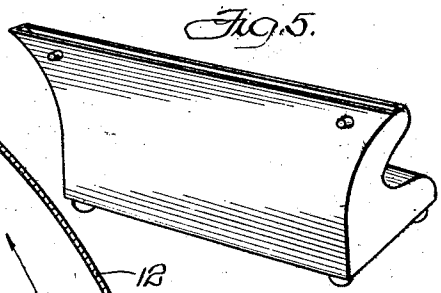
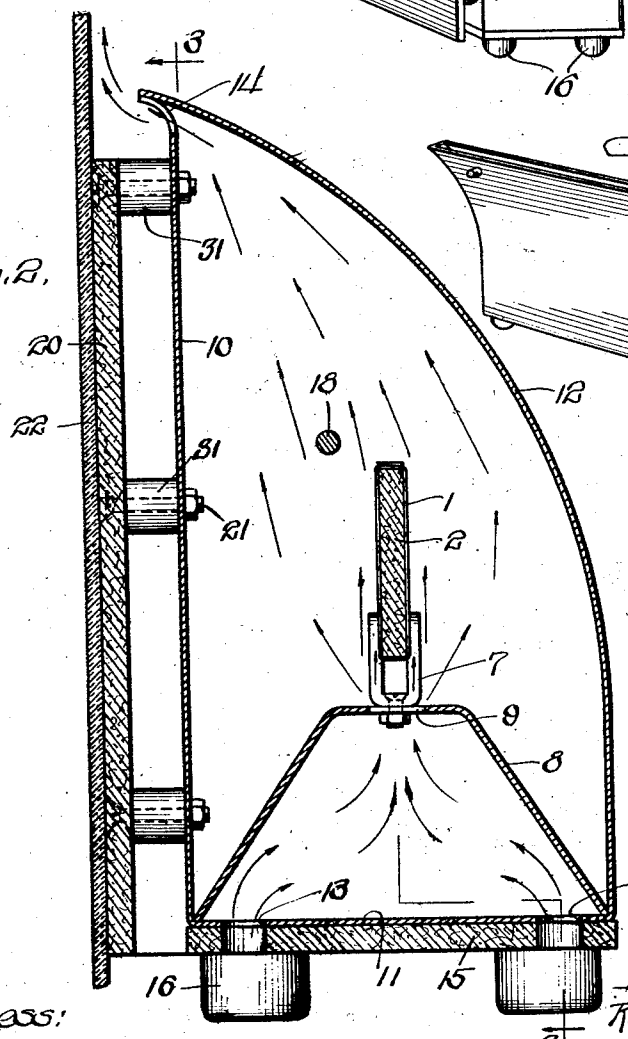


Fig. 2.



Witness:
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Inventors:
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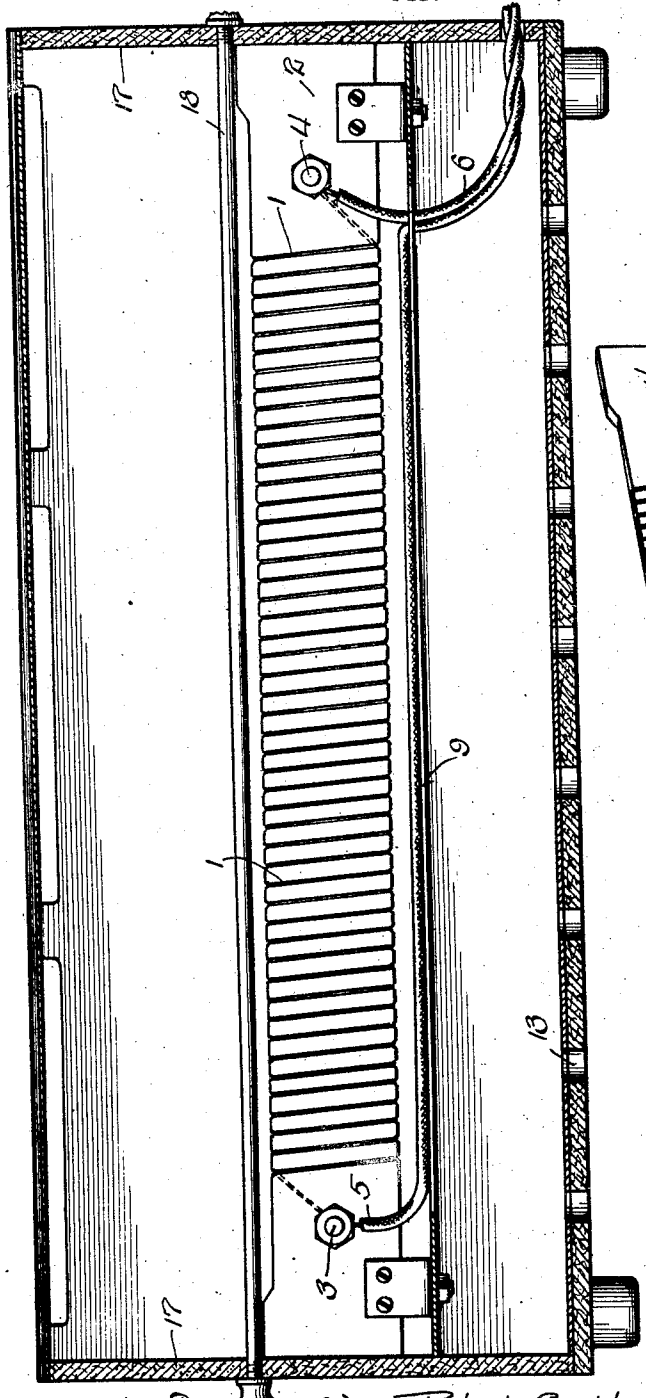


Fig. 3.

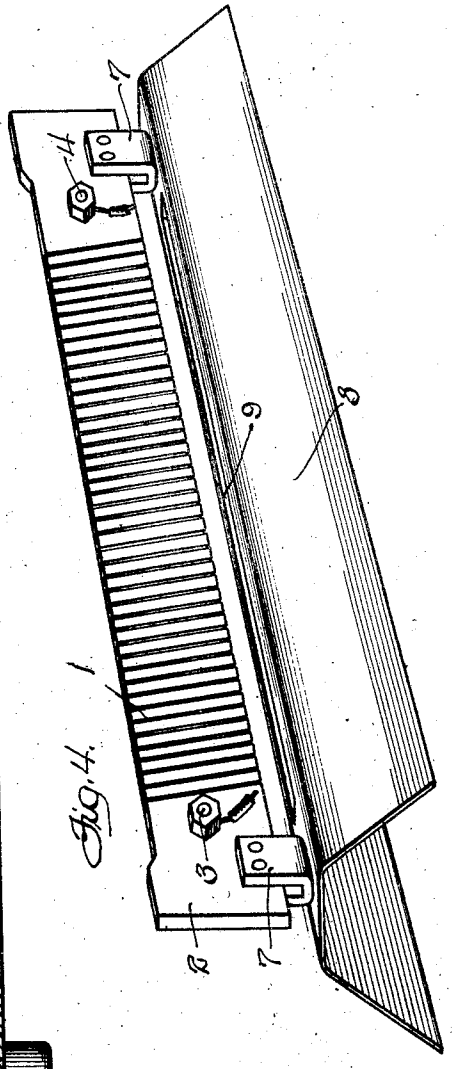


Fig. 4.

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Patented Dec. 2, 1924. 1,517,833

UNITED STATES PATENT OFFICE.

ROBERT GERTLER AND BENJAMIN FINE, OF CHICAGO, ILLINOIS, ASSIGNORS OF ONE-THIRD TO CHARLES C. HANSON, OF CHICAGO, ILLINOIS.

WINDOWPANE HEATER.

Application filed December 15, 1922. Serial No. 607,239.

To all whom it may concern:

Be it known that we, ROBERT GERTLER and BENJAMIN FINE, both citizens of the United States, and both residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in a Windowpane Heater; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to heaters and in its general objects includes the providing of a simple and inexpensive air heater which will effectively project the heated air laterally and which can be positioned close to a surface at the side towards which the air is projected without causing damage through the direct radiation of heat from the heater itself.

More particularly, our invention relates to means for projecting a current of hot air towards a window pane for the purpose of removing frost and dampness from the same. With this object in view, our invention aims to provide a portable appliance including a heating element which can readily be connected to an ordinary electric light socket; and aims to provide means for causing air to pass close to the heating element so as to be effectively heated by the latter, and for afterwards deflecting the heated air and accelerating the velocity of the current of air so as to cause the air to issue from the appliance in a heated stream which will travel for a considerable distance in the desired direction. Furthermore, we aim to provide our appliance with heat-insulating means which will prevent a damaging of the window pane or sash by the direct radiation of heat from the appliance in case the latter is brought too close to the glass of the window.

Owing to the high advertising and publicity value of show-windows, it is important that these should be kept clear even in quite cold weather, since any coating of frost, or even of the unfrozen mist, resulting from the deposit of moisture on the window will obscure the view of the goods which are on display. To avoid such an interference with the proper function of the show-windows, these are sometimes subjected to continuous heating, either by special radiators or by means of gas jets, but the arrangements required for this purpose not only are continuously in the way of the normal use of the show-window space but also consume an undesirable amount of energy. On the other hand, the use of electric fans for blowing warmer air from within the store against the show-windows is objectionable both because of the difficulty of having the air strike all needed portions of the window and because the resulting blast is apt to disturb the arrangement of the goods which are on display.

As a substitute for all three of the above mentioned arrangements and for the costly special window pane heaters which have heretofore been proposed as stationary window attachments, our invention provides a portable appliance which can readily be moved from one show-window to another, and one which can readily be slid or lifted from one to another of a number of different positions in any large show-window so that a single such appliance can be used successively for removing the frost and mist from the entire surface of a large number of show-windows. Still further and also more detailed objects will appear from the following specification and from the accompanying drawings, in which

Fig. 1 is a perspective view of a heating appliance embodying our invention.

Fig. 2 is an enlarged central and transverse vertical section through the same.

Fig. 3 is a vertical section taken longitudinally of the same appliance along the line 3—3 of Fig. 2.

Fig. 4 is a perspective view of the heating element of the appliance and of the support for the same, showing these parts as they appear when removed from the casing of the appliance.

Fig. 5 is a perspective view of another embodiment of our invention, namely one having upwardly flaring ends and having a different guard arrangement from that of Fig. 1.

In the drawings, the electric heating unit of our appliance is shown as comprising a high resistance wire 1 wound spirally on a bar 2 of insulating material and having its ends secured respectively to binding posts 3 and 4 to which the wires 5 and 6 of a flexible cord connected to an electric circuit are respectively attached. The insulating bar 2

is supported by a couple of U-shaped clips 7 fastened to the top of an inverted metal trough 8 which has a slot 9 extending longitudinally under the heating element. This inverted trough 8 flares downwardly so that it fits slidably within the metal casing which forms the air distributing chamber of our appliance. This casing is here shown as having a main portion comprising a sheet of metal bent to afford a vertical and flat front 10, a flat bottom 11 and a back 12. The bottom 11 is perforated, desirably by providing two rows of perforations 13 with each row at some distance from the vertical medial plane of the heating element while the back 12 is curved forwardly so that its upper edge overhangs the top of the front 10 and is spaced by a relatively short distance from this top. To hold this curved back in a fixed position, we desirably provide the front face 10 of the casing with a number of upwardly projected fingers 14 which are brazed or otherwise secured to the upper and forwardly directed edge of the back 12 after the manner shown in Figs. 1 and 2.

The bottom 11 of the casing desirably rests on a sheet 15 of a suitable insulating material, such as an asbestos board, and this board has feet 16 secured to it for supporting the casing in a slightly raised position. Each end of the metal casing is closed by an end piece 17 slidably inserted into the metal casing and desirably made also of an insulating material, such as asbestos board. To hold these ends in rigid position, we are here showing them as abutting against the ends of the insulating bar 2 of the heating unit and as being clamped against these ends by a rod 18 which extends longitudinally through the casing and which has knobs 19 of insuating material threaded upon its ends to clamp the casing ends 17 against the tips of the insulating bar 2.

With the appliance thus constructed, it will be obvious from Fig. 2 that when current is passed through the high resistance wire 1 of the heating element, the resulting heat will heat the air within the casing and the warming of the air will cause the same to rise. Also, that the forward curvature of the upper portion of the back 12 of the casing will cause the rising air to be deflected so as to issue in an approximately horizontal direction through the slots at the top of the casing. At the same time, the suction due to the air current will cause a fresh supply of air to be drawn in through the perforations 13 in the base of the casing, which perforations are opposite corresponding perforations in the heat-insulating board 15 under the bottom 11, while the sloping sides of the trough-like support will deflect the entering cool air toward the slot 9 so as to facilitate the movement of the air towards the heating element. By making this slot 9 only slightly wider than the thickness of the heating element, we can cause the fresh supply of air to move close to the hot wire and hence can secure an effective heating of the air during its movement through the casing. Furthermore, while the heating of the air will expand the same, the relatively small total size of the outlet slots adjacent to the top of the casing will cause the volume of air to be contracted prior to its emission from the casing, thereby accelerating the movement of the air after the general manner of a fluid nozzle. Consequently, the emitted hot air is not only deflected in a substantially horizontal (or slightly upward) direction, but also is projected with a sufficient velocity to predetermine its general direction of movement for a considerable distance.

In view of this accelerated movement and predetermined directing of the air, our heating appliance as above described will be effective even if placed at some distance from the window pane which is to receive the current of hot air. However, inexperienced users might be tempted to place such an appliance so close to a window pane that the direct radiation of heat from the forward wall 10 of the casing which becomes quite warm when the heater is in use would overheat the adjacent portion of the window-pane, and in cold weather the undue heating of such a relatively small portion of a window-pane might crack the latter. So also, if the heated metal front 10 of the casing were slid up against the wooden sash at the bottom of the window, the heat conducted through this metal front might damage the paint on the sash. To avoid such occurrences, we desirably provide heat-insulating means associated with the forward face of our appliance. For this purpose, we have found it practical to employ a shield 20 made of insulating board and extending parallel to the front 10 of the casing, but spaced from this front by insulating bushings 31 surrounding the bolts 21 which secure the shield 20 to the casing. With such a heat-insulating shield, it will be obvious from Fig. 2 that the appliance might even be slid into direct contact with the glass pane of the window, and that if this should occur both the insulation of the board 20 and the air space intervening between this board and the front 10 of the casing will afford effective heat insulations so as to prevent an undue warming and consequent cracking of the window-pane.

By using a wire 1 of a resistance adapted for an ordinary lighting circuit, our appliance can readily be connected to any convenient electric light socket, while the flexibility of the usual wire cord will also permit a given appliance to be moved from one point to another longitudinally of a large show window for use in removing the frost

or mist from the same. The connections of the cord to the electric light circuit are not illustrated, being well understood by all familiar with electric heating appliances. Moreover, the knobs 19 as employed for clamping the ends of the casing in position also serve as convenient handles for lifting or otherwise moving our appliance.

However, while we have heretofore illustrated and described our appliance in a desirable embodiment including a particular form of heating unit and including certain means for providing heat-insulation associated with the front and for fastening the ends of the casing, we do not wish to be limited to these or other details of the construction and arrangement here disclosed. Obviously, various changes might be made without departing either from the spirit of our invention or from the appended claims.

For example, Fig. 5 shows a perspective view of another embodiment in which the casing is flared at both ends at 30 so as to elongate the outlet opening 31 and in which the front of the casing is made of an insulating board 32 and is provided with forwardly projecting knobs 33 to prevent a direct contact between this front and a window-pane. Furthermore, we do not wish to be limited to the use of our invention for employment in connection with show-windows, as the same obviously might be used also as an air heater for more general purposes and particularly in any cases where it may be desirable to project the heated air in a predetermined direction.

We claim as our invention:—

1. An air heating appliance comprising a casing having a substantially horizontal and relatively narrow and elevated outlet at one side, a heating unit disposed within the casing below the outlet, the casing having inlets disposed lower than the heating unit, and a heat insulating facing disposed at the said side of the casing and spaced from the casing proper.

2. An air heating appliance comprising a casing having air outlets adjacent to its top and air inlets at its bottom and having a portion formed for directing rising air outwardly through the said outlets; a heating element disposed within the casing, and a support for the heating element; the said support being formed for causing the air entering through the said inlets to pass close to the heating element, the heating element and support being bodily removable as a unit from the casing.

3. An air heating appliance comprising a casing having air outlets adjacent to its top and air inlets at its bottom and having a portion formed for directing rising air outwardly through the said outlets, a heating element disposed within the casing, and a support for the heating element; the said support being formed for causing the air entering through the said inlets to pass close to the heating element, the said support comprising a sheet extending from end to end of the casing and bent into a substantially inverted U-shaped transverse section and having a slot in its top adjacent to the heating element.

4. A portable window pane heater comprising a casing equipped at its bottom for the entrance of air and having a substantially vertical front wall provided with an elevated air outlet, a heater mounted within the casing, and means extending forwardly from the said front wall for preventing a direct contact of the casing with a window pane faced by the said wall.

5. A window pane heater as per claim 4, in which the said means include a heat insulating member adapted to contact with the window pane.

6. A window pane heater as per claim 4, in which the said means comprise a sheet of heat insulating material and elements for spacing the said sheet forwardly of the said wall.

7. A portable window pane heater comprising a casing, a heating device within the casing, the casing having an air inlet below the heating device and a lateral air outlet disposed above the heating device at one side of the casing, and means projecting from the casing at the same side thereof, to maintain the casing spaced from a window pane, the said means including a member of heat-insulating material adapted to contact with a window pane adjacent to the said side of the casing and to provide an air space between the said casing side and the window pane.

8. In a heater, a casing having a bottom with air inlets therein and having an outlet adjacent its top, a member of substantially inverted U-shape having an air outlet in its top, said member being disposed within the casing so as to enclose and overlie the air inlets, an electrical heating element and means to secure the element to the top of the U-shaped member at a point substantially alined with the air outlet thereof.

9. In a heater, a casing having a bottom provided with air inlets, ends, and a front and back, the front being provided with an outlet adjacent its top, an inverted substantially U-shaped member in the casing overlying and enclosing the air inlets and having an air outlet in its top, an electrical heating element, means to secure the element to the top of the U-shaped member at points substantially alined with the air outlet thereof, said element having its ends abutting the respective casing ends, and means to simultaneously clamp the casing ends to and against the ends of the heating element.

10. In a pane heater, a portable casing

having an outlet in its top and an air inlet in its bottom, heating means in the casing, means to support the casing on a supporting surface and with its air inlet spaced above such surface, and means carried by the casing for engagement with a window pane to hold the front of the casing spaced from the pane, the top of the casing being curved forwardly to direct heated air egressing from the outlet across the space between the pane an dthe casing front and to also direct air flowing upwardly between the pane and casing front into the path of said heated air.

11. In a heater, a casing having an outlet in its top and air inlets in its bottom, an air collector in the casing overlying and inclosing the air inlets and having an outlet in its top, an electrical heating element, and means to connect said element to the collector at points vertically alined with and adjacent to the collector outlet.

12. In a heater, a casing having ends, a bottom formed with an air inlet, a back and a front formed with an air outlet, an air collector in the casing seated on the casing bottom and engaged with the front and back of the casing and having an outlet in its top, an electrical heating element vertically alined with the collector outlet, means to secure the element to the collector, and means to clamp the casing ends to and against the respective ends of one of the last named parts.

Signed at Chicago, Illinois, December 12th, 1922.

ROBERT GERTLER.
BENJAMIN FINE.