A. WESSIG
WINDOW CLEARING APPARATUS
Filed Dec. 24, 1920
3 Sheets-Sheet 2

Inventor: August Wessig

Witness: H. Smith

By...
To all whom it may concern:

Be it known that I, August Wessig, a former subject of the former Emperor of Germany, who have declared my intention of becoming a citizen of the United States and have taken out first papers for naturalization as such, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Window-Clearing Apparatus, of which the following is a specification.

This invention relates generally to heat distribution, and pertains particularly to improvements in apparatus for applying heat to windows and the like for the purpose of preventing their becoming obscured by the collection of water or frost thereon from condensation or otherwise.

The general purpose of the invention is the provision of a simple and compact apparatus which may be easily installed in association with any sort of window, either in a building or in a vehicle, in such relationship as to impinge jets of heated air thereon for the purpose specified.

A corollary purpose of the invention is the provision of an apparatus of this type which is self-contained, in the respect that the air heating and circulating means are housed and mounted together in such fashion that their cooperative relationship is always maintained, and their installation or change of position may be made without requiring changes in the structure with which they are associated.

A further object of the invention is the provision of an apparatus of the sort specified which is automatic in its operation, in that it requires no supervision during its operation, whereby it is particularly adapted for use in the protection of show windows during the night time.

A further object is the provision of an apparatus which is fireproof, which is not subject to over-heating, and which is highly efficient in the utilization of the desired points of the heat generated.

Another object of the invention is the provision of an apparatus of the sort described which will generate and distribute the desired heat rapidly and constantly, and without vitiation of the air of the compartment in which it is operated, and which thereby is particularly adapted for use in protection of show windows in which plants may be displayed.

A more specific object of the invention is the provision of a structure comprising the combinations and arrangements of parts hereinafter claimed.

Other and further objects of the invention will be pointed out hereinafter, indicated in the appended claims, or will be obvious upon a consideration of the illustrative embodiments herein disclosed, the same being here presented for their illustrative value, and not with the purpose of limiting the invention to the particular structures shown.

In the drawings,

Fig. 1 is a fragmentary elevation of a trolley car vestibule showing a manner in which my invention may be installed for use therein;

Fig. 2 is a detail in the nature of a section such as would be taken substantially on line 2—2 of Fig. 1;

Fig. 3 is another detail section such as might be taken on line 3—3 of Fig. 1;

Fig. 4 is a longitudinal section through one form of generating unit constituting a part of my invention;

Fig. 5 is a rear end elevation of the same;

Fig. 6 is an interior elevation of the rear cover plate;

Fig. 7 is a diagram illustrating the energizing circuits;

Fig. 8 is a longitudinal sectional view of another form of generating element;

Fig. 9 is a cross section of the air compressor of the same, taken substantially on line 9—9 of Fig. 8; and

Fig. 10 is a diagram illustrating the energizing circuits of the apparatus of Fig. 8.

Referring to the drawings in detail by means of the reference numerals applied, let it be understood that the numeral 1 designates generally a wall portion of a compartment forming a mounting for the window 2, while the numeral 3 designates generally the generating element and the numeral 5 the distributing element of my apparatus installed in association with the window. Installation is here shown on the interior of the compartment, but it is obvious that it may be installed either inside or outside as conditions may determine.

The generating element in the form illustrated in Figs. 1 to 7 inclusive includes a casing member 6 which may be formed conveniently in cylindrical shape of a section of metal pipe supporting at its forward.
end a funnel-like reducing cap 7 fitted for connection with the distributing element 5 by a union 8. The forward portion of the casing 6, together with the cap 7, are lined with suitable heat insulating material 9, while the rearward portion of the casing provides a mounting for the reception of a removable collar or frame 10, which is adapted to be slipped into the casing through the rear end thereof and to have a proper fit so that it may be rotated therein while being maintained in proper axial position. The rear end of the casing is closed by a removable cover 11 which is connected to the collar 10 by screws 12 operating through slots 14 in the casing, and thereby affords means whereby the collar may be rotated within the casing. The collar and casing are provided with circumferentially spaced apertures 13 adapted to be moved into and out of register by rotation of the former, whereby the effective area of said apertures for the admission of air into the casing may be varied. The collar supports at its forward portion a spider 16 forming a mounting for the base 17 of a heating element, which may be constituted of an insulating spindle 18 and exposed resistance coils 19. Within the collar is mounted a motor 20 carrying a fan 21 arranged to induce by its operation a proper air compression within the forward portion of the casing to induce a constant flow of air through the same and out through the distributing element 5, the air being admitted behind the fan through the apertures 15. Suitable connection wire 22 leads from the heating element to a switch 24 supported on the inside of the cap 11, and another connection wire 25 leads from the motor to a switch 26, from which switches the inlet wires 27 are led out through an insulation boss 28 to a connection 29 whereby they may be connected in a supply circuit. The switches 24 and 26 are operable from the exterior of the casing to control energization of the motor and the heating element. Fig. 7 illustrates diagrammatically the preferred arrangement of the connections wherein 8 designates the energizing source, and from which it will be observed that the energization of the heating element and the motor may be controlled independently.

The distributing element 5 is in the nature of a conduit or pipe which may be disposed in proper association with the window so that its discharge apertures 5* may be arranged to impinge jets of air upon the window in such fashion as to cause it to travel thereacross. The heating coil and motor being energized, the operation of the fan will move air through the casing about the heating element so that the air is heated thereby, and due to the heat expansion and the continued effect of the fan a compression is built up in the casing which finds relief by movement of the air through the distributing element 5, thereby producing forcible jets from the discharge apertures. These will be effective, when in proper amount, to prevent the collection of moisture from condensation upon the window, or prevent the formation of frost thereon, and the heat thus distributed will also protect contents of the window, in the event it is used for display.

It will be observed that the cross sectional area of the heating chamber is much greater than that of the discharge orifice, which relationship is of importance in that the air is retained an appreciable time about the heating element so that its temperature may be raised to a much greater degree than if the rate of discharge were substantially equal to the rate of supply. This arrangement also contributes to the production of the necessary pressure to sustain a continued forcible ejection of air from the discharge apertures, whereby a continuous and well defined current of heated air is maintained along the surface of the window.

In the embodiment illustrated in Figs. 8, 9 and 10, the forward portion of the casing is closed by a partition 30 to provide a tight chamber in which the heating element is used. An outlet from this chamber is afforded by a connection 31 leading to the distributing element 5 and an inlet is afforded by means of the connection 32 leading from the air compressor 34 which is mounted on the motor frame and which is operated by the motor. A form of compressor is illustrated in Fig. 9, its intake from the exterior of the casing being illustrated at 35. In this form automatic means is provided for controlling the energization of the heating element and of the motor. That utilized for controlling the heating element may consist of a thermostat switch 36 arranged within the compression compartment and adapted to open and close the electrical connection to the heating element. The arrangement is such that when the temperature within the compression compartment drops below a predetermined minimum the switch will be closed and the heating element energized, while, when it reaches a predetermined maximum the circuit will be opened. The means for automatically controlling the energization of the motor may include a pressure responsive element such as the diaphragm 37 which is subject to the influence of the air pressure within the compression chamber, and which controls a switch 38 adapted to open and close the supply connection to the motor. When the compression within the chamber drops below the desired minimum, the circuit will be closed and the motor energized to build up the compression, while, when it reaches a...
predetermined maximum, the switch will be opened. In this fashion, a constant supply of heated air will be maintained under proper compression and at proper temperature to insure the desired operation of the apparatus. It is obvious that the disposal of the distributing element 5 may be that which is most efficient in securing the desired distribution of the air upon the window.

An apparatus constructed in the fashion above described is of particular advantage from the circumstance that it is entirely self-contained and its installation involves simply the assembly of the parts in proper relationship to the window. Moreover it may be moved about as a unit and disposed wherever its influence may be desired. It may be built up entirely of elements now sold commercially and obtainable at low cost, and its assembly is simple. It is absolutely safe, in that all operating parts are effectively housed, and external parts are protected from over-heating, thus obviating necessity for supervision of its operation.

I claim:

1. In an apparatus of the class described, the combination of a casing having a restricted discharge orifice, a collar member insertable into said casing, a heating element supported at the inner end of said collar, air propelling means mounted in the collar member in position to impel air against the heating element, and means for controlling energization of the heating element and propelling means.

2. In apparatus of the class described, in combination a casing having a restricted discharge orifice, a collar member insertable into said casing, a heating element supported at the inner end of said collar, air propelling means mounted in the collar member in position to impel air against the heating element, and means for controlling energization of the heating element and propelling means.

3. In apparatus of the class described, in combination, a casing, a collar member mounted therein, a heating element supported on the inner portion of the collar member, said collar member affording an air inlet, air propelling means supported on the collar member between said inlet and the heating element, and means for controlling energization of the propelling means and heating element.

4. In apparatus of the class described, in combination, a casing affording a chamber with a restricted discharge opening, a heating element mounted in said chamber, air propelling means mounted in said casing to impel air on to the heating element and compress it in said chamber, and means for controlling energization of the heating element and air propelling means.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

AUGUST WESSIG.

Witnesses:
FRANCES K. GILLESPIE,
C. S. BUTLER.