

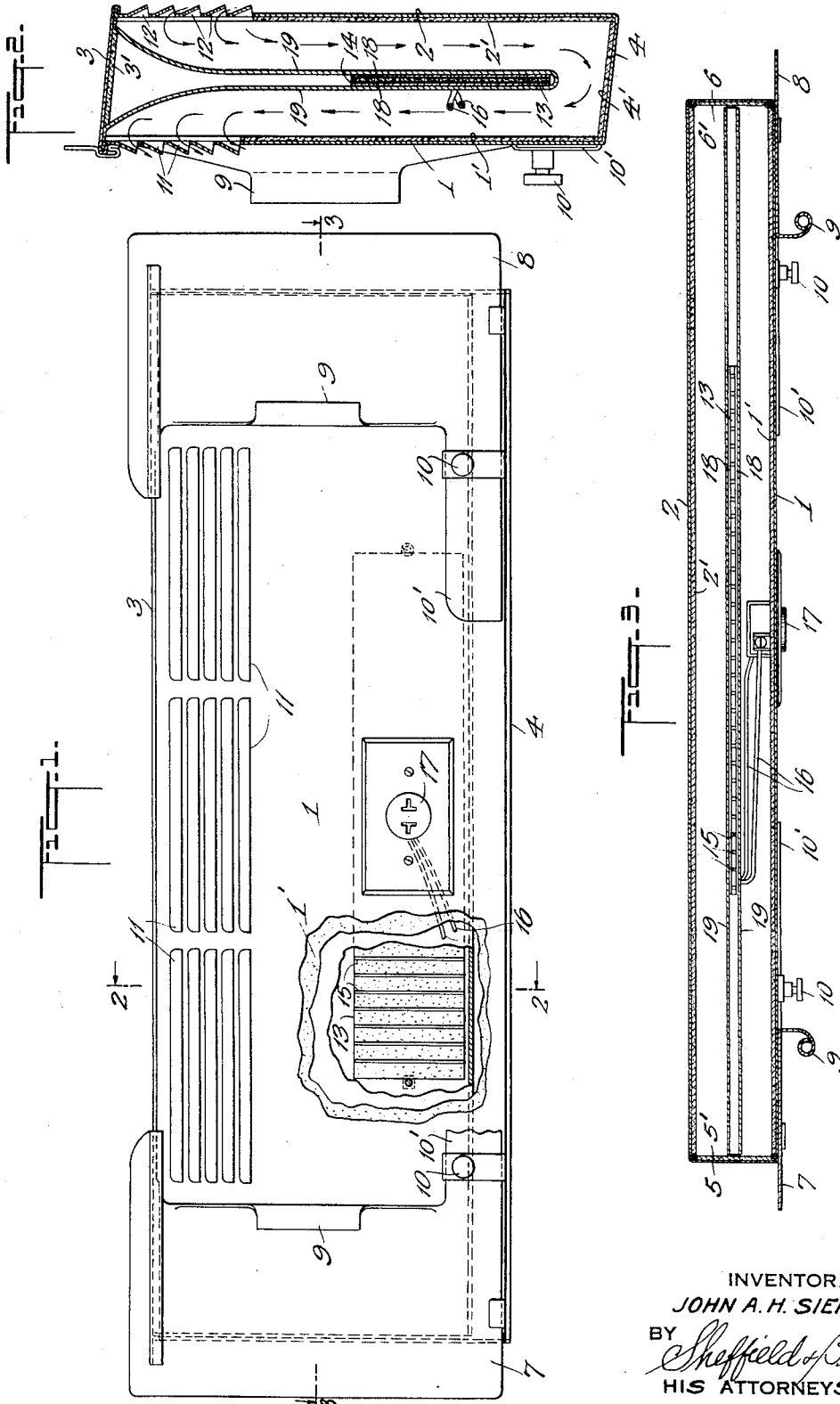
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AIR TEMPERATURE REGULATING APPARATUS

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AIR TEMPERATURE REGULATING APPARATUS

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This invention relates to air temperature regulating apparatus for supplying air at an approximate desired temperature to the rooms of dwellings, offices, factory buildings and other domestic or mercantile establishments.

It is one of the objects of my invention in a preferred embodiment thereof to provide apparatus of this kind of a portable character, which may, for instance, be easily and quickly arranged in a window frame beneath a movable sash as a ventilator to change the temperature of the outside air before its admission to the room.

A more particular object of the invention is to provide such apparatus with easily adjusted means whereby it may be fitted within window frames of various widths, and the said means being of such construction as to protect the frame against possible damage from direct contact of the casing of the apparatus therewith.

My invention in its preferred practical embodiment has as its characteristic essential feature, a casing of suitable dimensions provided with openings in its opposite side walls for the inlet and outlet of air, and a temperature regulating means or unit supported in a central vertical plane from the top of the casing between said inlet and outlet openings. Preferably, the supporting means for said unit is in the form of a hollow vertical partition of suitable conductive material spaced from the bottom of the casing and forming in conjunction with the walls thereof a circuitous air passage. The temperature regulating unit of comparatively small size is contained in the central lower portion of this partition, the side walls of which are suitably attached at their upper ends to the casing walls. A removable sealing means is provided for the upper open end of the partition. Thus the remaining space within this hollow partition provides a collecting chamber for the vapor or other temperature regulating medium. The small unit may be very economically operated while owing to the extensive conductive and radiating area of the partition walls, a relatively large volume of air will be heated or otherwise conditioned in its passage through the casing.

It is a further general object of my invention to provide an air temperature regulating apparatus of the above character which will be efficient and economical in operation, simple in its construction and capable of manufacture at comparatively small cost.

With the above and other objects in view, the invention consists in the improved air temperature regulating apparatus, and in the form,

construction and relative arrangement of its several parts, as will be hereinafter more fully described and illustrated in the accompanying drawing and subsequently incorporated in the subjoined claims.

In the drawing wherein I have illustrated one simple and practical embodiment of the invention, and in which similar reference characters designate corresponding parts throughout the several views,—

Figure 1 is a front elevation of my improved air temperature regulating apparatus, a portion of the casing being broken away, and disclosing the temperature regulating unit;

Fig. 2 is a transverse sectional view taken substantially upon the line 2—2 of Fig. 1; and

Fig. 3 is a horizontal sectional view taken substantially upon the line 3—3 of Fig. 1.

Referring in detail to the drawing, the casing is preferably of elongated rectangular form and includes the front and rear walls 1 and 2 respectively, top and bottom walls 3 and 4 and opposite end walls 5 and 6 respectively. The top wall 3 of this casing is preferably in the form of a movable cover which may be hingedly or detachably connected to the casing, and in the present instance as indicated in Fig. 2 of the drawing, has a slidable connection with flanges suitably formed on the upper ends of the front and rear walls 1 and 2 of the casing. The underside of this cover 3 is provided with a sheet of sealing or insulating material indicated at 3' for a purpose which will be presently disclosed.

The bottom wall 4 of the casing is, in the illustrated construction, disposed at a transverse inclination downwardly from the front wall 1 to the rear wall 2 of the casing, so that it will properly seat upon a window sill.

At the opposite ends of the front wall 1 of the casing, the longitudinally adjustable plates 7 and 8 are suitably connected therewith and are adapted for engagement with the opposite vertical portions of a window frame to retain the casing in removably fixed relation thereto. These plates may be provided with suitable finger-pieces for the convenient operation thereof, and adjustable means of any preferred type such as that indicated at 10 is also provided to cooperate with tongues 10' on the lower ends of said plates to retain the latter in their adjusted positions.

The front and rear walls 1 and 2 are provided with suitably formed outlet and inlet openings 11 and 12 respectively, and the various walls of the casing are preferably internally covered with a suitable insulating and fireproof material such

as asbestos or the like, as indicated by the characters 1' to 6' respectively.

In the present instance, for the purpose of heating the incoming air, I have shown a heating unit 13 which may consist of any suitable device adaptable for use in the present apparatus. As shown, this unit may consist of the asbestos plate 14 constituting a core upon which the heating resistance wires 15 are suitably wound. These wires or conductors are connected with suitable leads 16 which in turn are connected with the contacts of a suitable socket 17 mounted in one side wall of the casing and adapted to receive the prongs of a conventional connecting plug (not shown).

The heating conductors or resistance wires are preferably covered with sheets or layers of mica composition material 18, and this unit is supported or mounted within the housing 19 preferably of sheet aluminum or other good conductive material. As herein shown, this housing constitutes a central hollow partition extending substantially the full length of the casing and having a closed lower end spaced from the bottom wall of the casing. The parallel vertical walls of this housing or partition preferably have their upper edges divergently extended towards the front and rear side walls of the casing, and suitably attached to the upper edges thereof. Between these attached edges, the upper longitudinal opening of this hollow partition is securely sealed by the insulating sheet 3' on the cover 3 of the casing, as clearly shown in Fig. 2 of the drawing. Thus, it will be apparent that this housing or hollow partition in conjunction with the casing walls forms a circuitous air passage through the casing between the inlet openings 12 and the outlet openings 11 in the upper end portions of the opposite side walls of the casing.

The heating or other temperature regulating unit 13, as clearly seen in Figs. 1 and 2 of the drawing, is of comparatively small size with respect to the area of the partition or housing, and is located within the lower central portion of the latter. Thus, it will be evident that since this relatively small unit will consume little current, a desirable economy in operation is effected. Nevertheless, as the generated heat or other temperature regulating vapor will collect and fill the interior of the housing, each of the walls 19 of comparatively large area, will throughout their extent, act to conduct and radiate the temperature regulating medium more or less uniformly throughout all portions of the air passage through the casing.

It is, of course, to be clearly understood that the specific form of the casing, and of the supporting housing or partition for the temperature regulating unit is merely suggestive, and may be varied at will, depending upon the particular use or application of the apparatus. It will further be evident that the air passing through the casing may be cooled instead of heated by the use of an air cooling means such as solidified carbon dioxide in place of the heating unit above referred to. In such event, it is apparent that the openings 11 and 12 in the casing walls may be otherwise arranged.

From the above description considered in connection with the accompanying drawing, the operation and several advantages of my improved air temperature regulating apparatus will be readily understood. As the air enters the casing through the openings 12, it immediately comes into contact with the adjacent wall 19 of the

central partition and is thereby directed downwardly around the lower end of said wall and then upwardly in contact with the opposite side wall of the partition, so that such air will be continuously influenced by the air temperature regulating medium and will pass from the casing through the openings 11 at approximately the desired temperature. In the illustrated use of the invention for the purpose of heating the air, the upward flow of highly heated air to the openings 11 will tend to cause a continuous circulation of the air through the casing in accordance with the well known principle of an inverted siphon. It will be understood that the air in the inlet passage, above the heating unit 13, is relatively cool, but progressively increases in temperature as it moves downwardly in contact with the lower end portion of the partition 19, which is directly heated by the unit 13. Below said wall a sudden expansion of the heated air takes place, producing an induction effect on the inlet side of the passage and an upward pressure on the outlet side thereof, where the air is further heated and its discharge through the outlet openings facilitated. Therefore, rapid flow of the air will be produced and warm fresh air discharged through the openings 11 into the room.

While I have herein shown a simple and practical embodiment of my improved air temperature regulating apparatus, it will be evident from the foregoing that the essential features thereof may also be exemplified in various other alternative structural forms. Accordingly, the privilege is reserved of resorting to all such legitimate changes therein as may be fairly embodied within the spirit and scope of the invention as claimed.

What I claim and desire to protect by Letters Patent is:

1. Air temperature regulating apparatus including a rectangular casing provided in opposite side walls thereof with air inlet and outlet openings respectively, a vertical partition within said casing extending the entire length thereof and spaced from the bottom thereof and, in conjunction with the casing walls, forming a circuitous passage between said inlet and outlet openings, and a temperature regulating unit supported solely by said partition.

2. Air temperature regulating apparatus, including a rectangular casing provided in the upper ends of its opposite side walls with air inlet and outlet openings respectively, a vertical partition centrally arranged within said casing in contact with opposite ends thereof, and spaced from the bottom of the casing to form, in conjunction with the casing walls, a circuitous passage between said inlet and outlet openings, and an air temperature regulating unit supported by said partition below said openings, said partition constituting a conductor and distributor of the temperature regulating medium throughout the length of said passage.

3. Air temperature regulating apparatus, including a rectangular casing provided at the upper ends of its opposite side walls with air inlet and outlet openings respectively, a hollow vertical partition centrally arranged within the casing and in conjunction with the latter forming a circuitous passage between said inlet and outlet openings, and an air temperature regulating unit supported within said partition and in direct contact with the walls thereof.

4. Air temperature regulating apparatus, including a rectangular casing provided at the upper ends of its opposite side walls with air inlet

- and outlet openings respectively, a hollow vertical partition centrally arranged within the casing and in conjunction with the latter forming a circuitous passage between said inlet and outlet openings, and an air conditioning unit of comparatively small size housed within the lower central portion of said partition, the remaining interior of the partition constituting a collecting chamber for the temperature regulating medium.
5. Portable air temperature regulating apparatus, including a rectangular casing provided at the upper ends of opposite side walls thereof with air inlet and outlet openings respectively, a hollow partition suspended from the top of the casing centrally therein extending substantially the entire length of said casing and spaced from the bottom thereof to form, in conjunction with the casing walls, a circuitous air passage between said inlet and outlet openings, and an electrical temperature regulating unit of relatively small area in respect to said partition housed within the lower end portion of the partition in direct contact with the walls thereof.
6. Portable heating and ventilating apparatus, including a casing provided at the upper ends of its opposite side walls with air inlet and outlet openings respectively, a hollow vertical partition centrally arranged in the casing and spaced from the bottom wall thereof to form, in conjunction with the casing walls, a circuitous passage between the inlet and outlet openings, a heating unit housed within said partition, insulating means covering the inner surfaces of the casing walls, and relatively adjustable members mounted on opposite ends of the casing to detachably retain said casing in applied position relative to a fixed support.
7. In air temperature regulating apparatus, a rectangular casing having opposed walls provided with air inlet and outlet openings respectively,
- a hollow vertical partition within said casing cooperating with the walls thereof to form a circuitous passage between said inlet and outlet openings, said partition having an upper open end for the insertion of air temperature regulating means within said partition and wholly below the open end thereof, and means mounted on the casing and movable relative thereto independently of said means for sealing the open end of said partition.
8. In air temperature regulating apparatus, a rectangular casing having opposed walls provided with air inlet and outlet openings respectively, a hollow vertical partition within said casing cooperating with the walls thereof to form a circuitous passage between said inlet and outlet openings, said partition having an upper open end for the insertion of air temperature regulating means within said partition and wholly below the open end thereof, and a removable cover independent of said means for the upper end of the casing provided with means for sealing the open end of said partition.
9. Air temperature regulating apparatus including a rectangular casing, a vertical partition extending downwardly from the top of the casing for the entire length thereof and spaced from the bottom of the casing, opposite side walls of the casing, at the upper ends thereof, being provided with air inlet and outlet openings respectively between which said partition is disposed, said partition in conjunction with the casing walls forming a circuitous passage between said inlet and outlet openings, and means for directly heating the lower portion only of said partition whereby the upper portion of said partition is indirectly heated by said means to a relatively low temperature.
- JOHN A. H. SIERS.

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