July 17, 1956 G. G. O'BRIEN 2,754,746

DOORWAY HEATER

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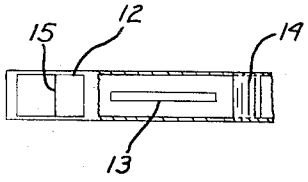


FIG. 3

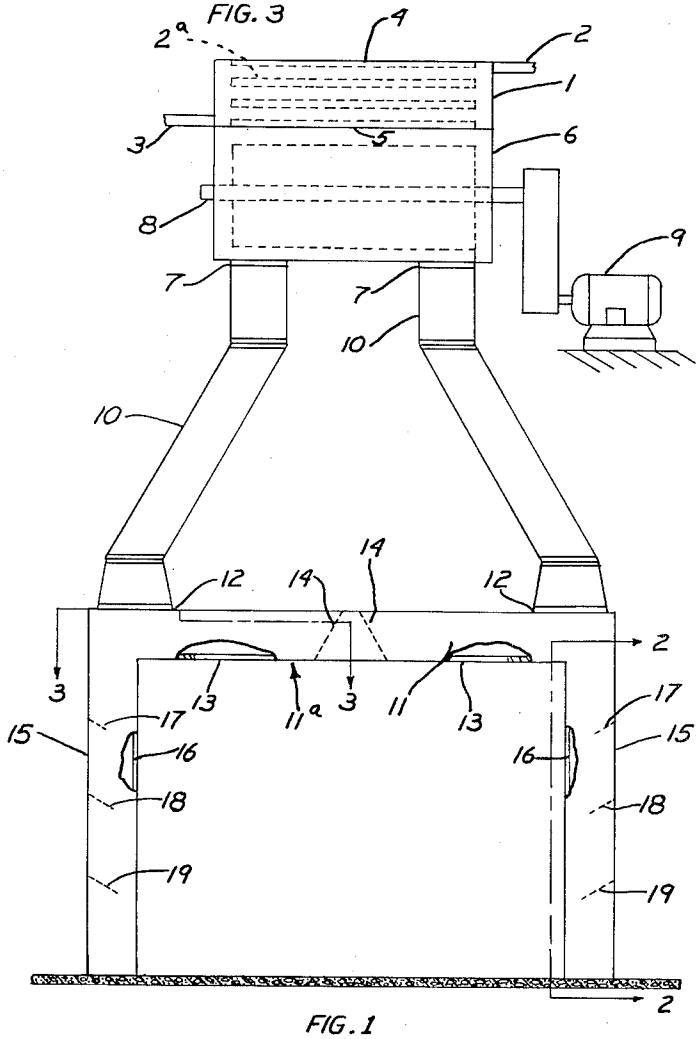


FIG. 1

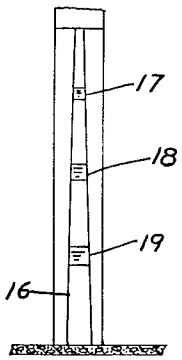


FIG. 2

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DOORWAY HEATER

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2 Claims. (Cl. 98—36)

This invention relates to an air heating system and more particularly to a doorway heating system whereby heated air is projected within said doorway in the form of a sheet of heated air that insulates the inside of the building from the outside air.

In buildings with truck loading platforms contained therein, difficulty arises in keeping the temperature of the inside of the building constant when trucks enter and leave the building during the winter months. This is due to the doors being opened and closed frequently, thereby allowing the cold air to enter the building. It is therefore an object of the invention to provide means to supply heated air to the doorway opening.

Another object of this invention is to provide a doorway heater of new and improved construction that prevents cold drafts from entering the building when the doors are opened by projecting a sheet of heated air within said doorway.

Another object is to provide a doorway heater that is simply constructed, easily assembled, and more efficient in operation.

Other objects of the invention will become apparent from the following description, the drawings to which it relates, and the claims hereinafter set forth.

This invention comprises the new and improved construction and combination of parts and their operating relation to each other which will be more fully described hereinafter and the novelty of which will be particularly pointed out and distinctly claimed.

In the accompanying drawings to be taken as a part of this specification, there is fully and clearly illustrated a preferred embodiment of the invention in which drawings:

Figure 1 is a view, generally in elevation, of the heating system including the doorway frame,

Fig. 2 is a view of one of the vertical members of the doorway frame taken along the line 2—2 of Fig. 1 showing an air outlet slot and certain air-directing baffle members, and

Fig. 3 is a broken sectional view on the line 3—3 of Fig. 1 showing a portion of the horizontal member of the doorway frame.

Referring to the drawings by numerals of reference, there is shown more or less diagrammatically a heating system having an air heater 1 of the unit blast heater type. The heater 1 is provided with a heat exchange coil 2^a, preferably of the steam type, and having a steam inlet 2 and a steam outlet 3, supplied from a boiler which is not shown. The heater 1 has an air inlet 4 and an air outlet 5 providing for air flow across the heat exchange coil 2^a. The air heater 1 is positioned in overlying relation to and with the outlet 5 in registry with the inlet to a blower 6. The blower 6 has a pair of outlets 7 for discharge of heated air therefrom and is connected for operation to a motor 9 by a drive shaft 8. The blower outlets 7 are connected by a pair of ducts 10 to a hollow doorway frame 11^a.

The doorway frame 11^a comprises a top frame member

11 and vertical side frame members 15. The top frame member 11 is a hollow horizontal member which has its opposite ends opening into the vertical frame members which are also hollow. The hollow horizontal and vertical frame members together form a supply chamber for discharge of heated air. The hollow horizontal frame member 11 has inlets 12 at opposite ends thereof and receiving the outlet ends of the air supply ducts 10. The inlets 12 are preferably positioned partially in overlying relation to the upper end openings of the vertical hollow frame members 15 and partially in overlying relation to the end of the horizontal frame member 11 so that the air stream entering therethrough will be divided for flow through both the horizontal and vertical hollow frame members. The hollow horizontal frame member 11 has longitudinally extending slots 13 in the bottom wall thereof on opposite sides of a center transverse partition formed by inclined baffle or wall members 14.

The hollow vertical frame members 15 each have a slot 16 in the inner wall thereof facing the doorway on opposite sides thereof for discharge of heated air into the doorway. The slots 16 are each tapered with increasing width toward the base or floor portion thereof to provide an equalized flow along their entire length which compensates for the pressure drop along the length of the slot. Within the hollow vertical frame members 15 there are positioned a plurality of baffles 17, 18, and 19. The baffles 17, 18, and 19 are spaced vertically from each other and are preferably of increasing width so as to intercept substantially equal portions of the air stream and divert the same for substantially even discharge through the slots 16.

Operation

Referring to the drawings, the operation of the doorway heater is as follows. The air to be heated enters the heater 1 through the inlet port 4, passes over a plurality of heat exchange surfaces and leaves the air heater at the outlet 5. The heated air enters the inlet to the blower 6 and is discharged through the outlet ports 7 into the ducts 10 for discharge into the doorway frame. After passing through the ducts 10, the heated air enters the inlet ports 12 of the horizontal frame member 11 of the doorway frame 11^a. This air flow is divided at the intersection of the hollow horizontal frame member 11 and the hollow vertical frame members 15 for flow through and discharge from those members. The heated air flowing through the horizontal frame member 11 is discharged vertically downward through the slots 13 and that flowing through the vertical frame members 15 is discharged through the tapered slots 16, thereby forming a blast or sheet of heated air across the doorway. The volume of air so discharged may be varied, if desired, to permit the temperature inside the building to remain substantially constant. It should again be noted that slots 16 in the vertical members 15 are tapered so that the width of the slots increase toward their base. The taper permits substantially equal amounts of air to be discharged along the entire length of the slots 16 to compensate for the pressure drop toward the lower section of the frame. It should also be noted that vertical members 15 contain baffle members 17, 18, and 19, which deflect the air outwardly toward the center of the dorway to equalize the flow of air discharging along the slots 16. The vertical baffles 14 in the horizontal member 11 separate the doorway frame into two sections, thus permitting an even distribution of air to both sides of the doorway frame.

While this heating system has been described without regard to any control thereof, it should be apparent that it is susceptible of any suitable control. This system could be operated continuously or turned on manually

when the door is opened. It could also be operated automatically, as by a thermostatic control or a switch operated by the opening of the door or a time switch.

The doorway frame disclosed in this invention may be assembled within the walls and ceiling of the doorway having only sides of the doorway frame members containing the slots 13 and 16 exposed. The door used with said frame may be the conventional roll-up type that is located between the outside of the building and the doorway frame.

Various modifications other than those illustrated and described will be obvious to the artisan without departing from the scope and intent of the invention which is to be limited only by the appended claims.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent of the United States is:

1. In a doorway heating system, an air heating means, a blower, a doorway frame having a hollow horizontal member and two hollow vertical members so connected as to form a hollow frame, warm air ducts interconnecting said heating means and said frame, a baffle in said hollow horizontal member separating said horizontal member longitudinally into two sections, said hollow horizontal member having slotted discharge apertures located longitudinally along the bottom side thereof, said horizontal member being interconnected between said hollow vertical members, said vertical members having slotted discharge apertures located vertically along their inner sides which are tapered so as to increase in width toward the base, and baffles positioned within each of said hollow vertical members, said baffles each being secured at one end to said vertical member opposite said slotted discharge apertures and having the other end extending toward said slotted discharge apertures, and said blower being operable to discharge air from said heating means through said warm air ducts and through said slotted apertures in the vertical and horizontal members to form a sheet of warm air across said doorway, said baffles being operable to deflect said heated air from a vertical path to a substantially horizontal path through said slotted discharge apertures in said hollow vertical members.

2. A doorway frame adapted to receive heated air, comprising two hollow vertical members and a hollow horizontal member interconnected therebetween, a vertical baffle positioned in and separating said horizontal member longitudinally into sections and operable to distribute air uniformly in said doorway frame, said horizontal member having slotted discharge apertures located longitudinally on its bottom side for discharge of heated air therefrom, said horizontal member having apertures on its top side to permit the entry of heated air thereto, said vertical members having slotted discharge apertures located vertically on their inner sides which are tapered with increasing width towards the base for discharge of heated air therefrom, and a plurality of baffles positioned within each of said hollow vertical members, said baffles being spaced vertically from each other in each of said hollow vertical members and each being secured at one end to the inner surface of said hollow vertical members opposite said slotted discharge apertures, said baffles each having their other ends extending toward said slotted discharge apertures in a manner to deflect air flowing through said vertical member toward said slotted discharge apertures, said baffles progressively increasing in longitudinal dimension toward said base to permit substantially equal amounts of air to be discharged from said slotted discharge apertures.

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