W. F. PASCOE, JR.

HEATER.

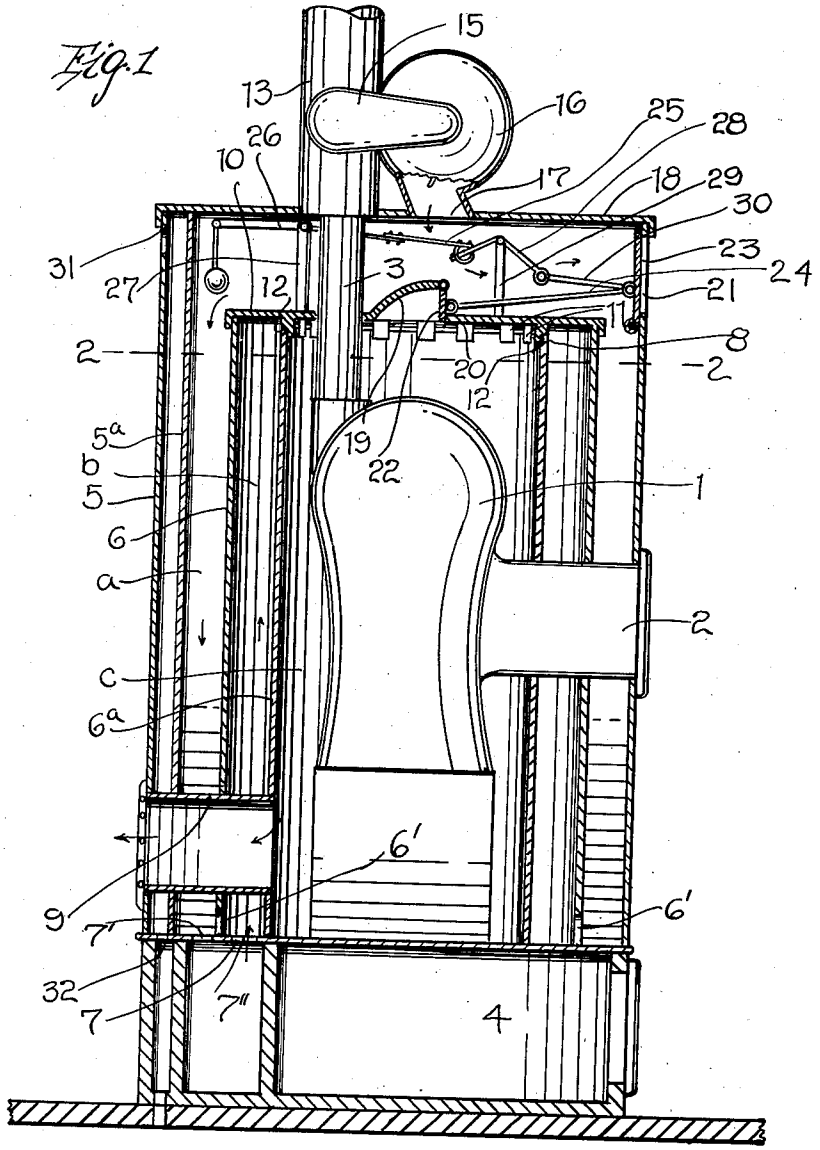
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1,074,195.

Patented Sept. 30, 1913.

2 SHEETS—SHEET 1.

Fig. 1



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2 SHEETS—SHEET 2.

Fig. 2

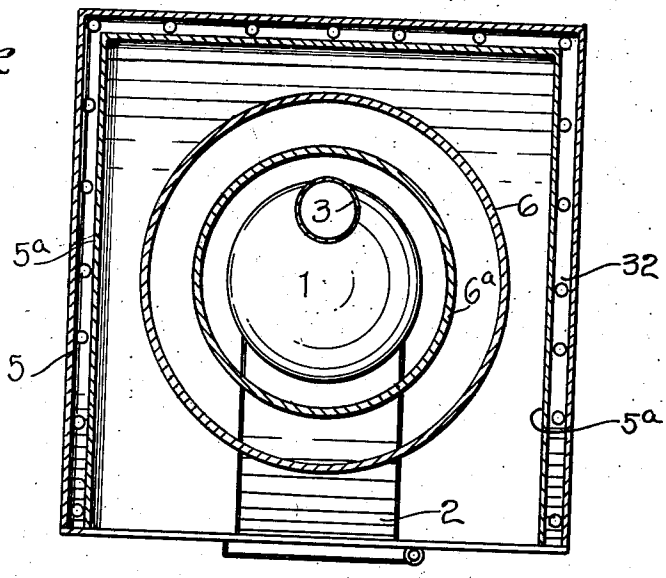


Fig. 3

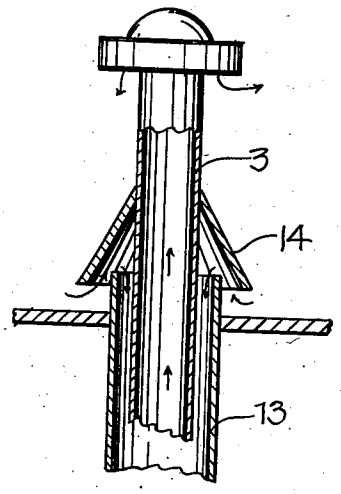
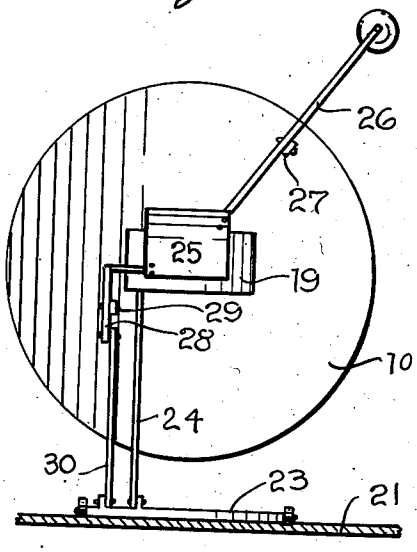


Fig. 4



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UNITED STATES PATENT OFFICE.

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HEATER.

1,074,195. Specification of Letters Patent. Patented Sept. 30, 1913.

Application filed February 10, 1913. Serial No. 747,544.

To all whom it may concern.

Be it known that I, WILLIAM F. PASCOE, Jr., a citizen of the United States, residing at Carlisle, in the county of Cumberland and State of Pennsylvania, have invented certain new and useful Improvements in Heaters, of which the following is a specification.

This invention comprehends certain new and useful improvements in hot air heaters and relates particularly to forced ventilation hot air car heaters of the type which is disclosed by my co-pending application for Letters Patent of the United States executed of even date herewith Serial No. 747,543.

As in the device of the co-pending application above mentioned, the present invention relates to that type of forced ventilation car heaters in which the fresh air is drawn in through the roof of the car and all contamination by the dust and dirt of the road bed prevented and furthermore, as in the device of the other application, the present invention has for its primary object improved means for preventing the heater from becoming heat bound.

In the present invention, the heater embodies a plurality of drums or casings spaced from the stove or heater proper and from each other and a housing extending around said drums, and the primary object is to provide a simple, durable and efficient construction of mechanism for automatically closing the fresh air inlet leading into the housing and its inclosed drums when the fan stops and for simultaneously opening doors which lead from the innermost drum directly surrounding the stove and from the housing itself whereby, upon stopping of the fan, air which would otherwise be confined within the housing may escape and the heater prevented from becoming heat bound.

The invention has for a further object an improved construction of heater of this character in which the damper which is designed to close by gravity or its equivalent across the fresh air inlet opening when the fan stops, is also arranged to open vents leading from the various drums, the parts being so arranged that they will require practically no attention and will not be liable to get out of order. And the invention also aims to generally improve devices of this character so as to render them more useful and commercially desirable.

With these and other objects in view, my invention consists in certain constructions, arrangements, and combinations of the parts that I shall hereinafter fully describe and claim, reference being had to the following description and accompanying drawings, in which,

Figure 1 is a vertical sectional view of a heater constructed in accordance with my invention; Fig. 2 is a horizontal sectional view thereof on the line 2—2 of Fig. 1; Fig. 3 is a detail view illustrating the upper end of the smoke pipe and its surrounding fresh air inlet pipe, and; Fig. 4 is a plan view of the top of the drums or casings and the parts supported thereon, and in connection therewith a portion of the front wall of the housing.

Corresponding and like parts are referred to in the following description and designated in all of the views of the accompanying drawings by like reference characters.

Referring to the drawings, the numeral 1 designates the heater proper or stove which may be of any desired construction or design and which is provided with a fuel inlet 2, a smoke pipe 3, and an ash box 4 which in the present instance is designed to be supported directly upon the floor of the car.

A housing 5 surrounds the stove 1 and is suitably spaced therefrom, said housing being rectangular in cross section in the present instance, although it is to be understood that my invention is not limited in this regard. Preferably the side and rear walls of the housing 5 are of double formation with an interior air space as clearly illustrated in Figs. 1 and 2, the inner portion of the housing wall being designated 5^a.

Contained within the housing 5 are any desired number of casings, said casings in the present instance being cylindrical and being two in number although it is to be understood that it is within the purview of my invention to have these casings of any desired shape or of any desired number. To identify them, the casings are designated respectively 6 and 6^a, the latter being the innermost one of the two. These casings are spaced from each other and the innermost casing is spaced from the stove 1, whereby a plurality of air chambers are formed, the

outermost air chamber into which the fresh air is initially admitted being designated *a*, being the space between the inner portion of the double walled housing 5 and the outermost casing designated 6, the intermediate chamber being designated *b* and being defined by the walls of the casings 6 and 6ª and the final or innermost chamber being designated *c* and being the space defined between the body portion of the stove 1 and the innermost casing 6ª. It is to be understood, as will be hereinafter more specifically described, that the fresh air is, in the present embodiment of my invention, first admitted into the outermost heating chamber *a*, and the air currents then flow down through openings 7′ in the base 7 of the body portion of the stove exterior of the ash pit or box 4 and thence up again through openings 7″ in the base 7 into and through the intermediate chamber *b* and finally through apertures 8 into the interior heating chamber *c*, finally flowing out from said last named chamber through an outlet flue 9 directly into the car or into distributing pipes (not shown) disposed therein. By this means, the air will be gradually heated from the time it enters the housing 5 until it reaches its maximum degree of temperature at the time it begins to pass through the outlet flue 9. Preferably, openings 6′ are formed in the casing 6 at the bottom thereof to provide for direct circulation of the air currents between the chambers *a* and *b*.

The casings 6 and 6ª are preferably provided with a top 10 which is common to them both and which is formed with a plurality of depending arcuate lugs 11 formed with shoulders 12 adapted to engage the upper edge of the innermost casing 6ª so as to produce, between said lugs the openings 8 for the passage of the current of air from the chamber *b* into the top of the chamber *c*.

In the operation of my improved forced ventilation hot air car heater, the fresh air is taken in through the roof of the car into a fresh air inlet pipe 13 which surrounds the smoke pipe 3 and which extends up through and to a point above the roof of the car as best illustrated in Fig. 3, where it is provided with a shield or petticoat 14 designed to prevent snow, rain, or the like, from finding ingress into the inlet pipe. Connected to the inlet pipe 13 at any predetermined or suitable point, is a suction flue 15 to which a fan casing 16 is connected, the fan of said casing being driven in any desired way as by an electric motor (not shown). The outer part of the fan casing 16 communicates with a fresh air inlet opening 17 that is formed in the top of the casing 5, the fresh air being thereby forced, in the operation of the fan, down around the top of the casings or drums 6 and 6ª and successively into the chambers *a*, *b*, and *c* hereinbefore described.

As set forth at the outset of the specification, it is one of the main objects of my invention to provide an improved means for automatically preventing the heater from becoming heat bound when the fan or other draft producing device is stopped, and in the present embodiment of the invention I accomplish this purpose by the following means: The top 10 of the concentric drums or casings 6 and 6ª is formed at a point which will communicate with the innermost chamber *c*, with a curved hood 19 which provides the innermost chamber *c* with a horizontally (and in the present instance forwardly) spaced opening 20 which is in substantially horizontal alinement with an opening 21 designed to establish communication between the exterior of the housing 5 and the top of the chamber *a* as well as, when combined with the opening 20, between the exterior of the housing and the interior of the chamber *c*. A door 22 is swung or hinged from its upper edge as clearly illustrated in Fig. 1 and is designed to close the opening 20 when said door or plate is in a substantially vertical position, and a corresponding door 23 swung or hinged from its lower edge as best illustrated in Fig. 1, is designed to perform a corresponding function for the opening 21. These two doors are connected together by means of a link rod 24 pivotally secured at its opposite ends to the respective doors, whereby when one door is opened the other will be opened also and when one door is closed the other will be also closed. To automatically operate these doors, I provide a plate 25 which is disposed underneath the opening 17 and which is of a size to entirely surround and close said opening when said plate is in its uppermost position. The plate is normally held in this position, when the fan is not operating, by means of a counterbalancing lever 26 fulcrumed on a post 27 which is secured to and projects from the top 10 of the concentric drums or casings 6 and 6ª. Pivotally connected to the plate 25 is one arm of a lever 28 fulcrumed intermediate of its ends on a post 29, the other arm of said lever being pivotally connected to a link 30 which is in turn pivotally connected to the outermost door 23.

From the foregoing description in connection with the accompanying drawings, it will be understood that when the fan or other draft producing device is in operation, the downwardly flowing current of air will directly act upon and against the plate 25 and will depress the latter against the action of the counterbalance lever 26, whereupon the lever 28 will rock in a direction to push upon the link rod 30 and hold the

doors 23 and 22 in closed position. As soon, however, as the fan stops and the draft ceases, the counterbalance lever 26 will be permitted to act and the plate 25 will be raised to close the opening 17, this connection resulting in rocking the lever 28 and pulling upon the link rod 30, consequently the doors 23 and 22 will be swung open and the air which would be otherwise confined within the innermost chamber *c* and the other chambers, will be permitted to escape out of the housing 5 and all liability of the stove becoming heat bound will be automatically precluded. It is of course to be understood that there are loose connections between the lever 28 and the plate 25 or between the plate 25 and its counterbalancing means 26 so as to provide the required movements of the parts. Preferably the space between the two portions of the double walled housing 5 is vented by outwardly flowing currents of air which pass up through the floor of the car and out through openings 31 formed in the outer wall of the housing near the upper edge thereof. These currents of air pass into this space from alongside the ash box through orifices 32 formed in the base of the body portion of the stove.

While the accompanying drawings illustrate what I believe to be the preferred embodiment of my invention, it is to be understood that the invention is not limited thereto, but that various changes may be made in the construction, arrangement, and proportions of the parts without departing from the scope of the invention as defined in the appended claims.

I claim as my invention:—

1. A heater of the character described, including a heater proper, a drum surrounding the same and spaced therefrom, whereby to form an inner heating chamber, another drum surrounding the first named drum and forming therewith an outer heating chamber, the top of the inner drum being provided with an upwardly projecting hood formed with a laterally facing vent opening, adapted to establish communication between the inner chamber and the outer chamber, the outer drum being formed with a laterally facing vent opening substantially in horizontal alinement with the first named vent opening, doors controlling said vent openings, a link connection between said doors, whereby they will move simultaneously, the outer drum being formed in its top with a fresh-air inlet opening, a forced draft device communicating with said fresh-air inlet opening and adapted to produce a current of air in a downward direction into the outer heating chamber, a damper plate mounted contiguous to said fresh-air inlet opening in line with the said current of air, means tending to move said plate in a direction to close the fresh-air inlet opening, and an operative connection between said plate and the door for the outermost vent opening, whereby the said door will be moved to an open position when the damper plate is moved toward a closed position, the two drums having communication one with the other irrespective of the first named vent opening, and the innermost drum being formed with a heated air outlet.

2. A heater of the character described, including a heater proper, inner and outer heating chambers extending around said heater proper, the inner chamber being provided on its top with a hood formed with a horizontally facing opening establishing communication between the inner and outer chambers, the outer chamber being formed with a horizontally facing opening in substantial alinement with the first named opening and also formed with an air inlet opening separate and distinct from its horizontally facing opening, a forced draft device communicating with the air inlet opening, a door swung from its upper edge upon said hood and adapted to close the first named horizontally facing opening, another door swung from its lower edge and adapted to close the second named horizontally facing opening, a plate adapted to close the air inlet opening and disposed in the path of the current induced by said forced draft device, whereby the actuation of the same will move said plate from the inlet opening, and connections between said plate and said doors, whereby the movement of the plate away from the inlet opening will close the doors against the horizontally facing openings and a movement of the plate toward the inlet opening will open said doors, and means tending to move the plate toward the inlet opening, the inner and outer heating chambers having communication one with the other irrespective of said first named opening and the inner chamber being formed with a heated air outlet.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM F. PASCOE, JR.

Witnesses:
VICTOR BRADDOCK,
S. J. MINNICH.