W. F. PASCOE, JR.

HEATER.

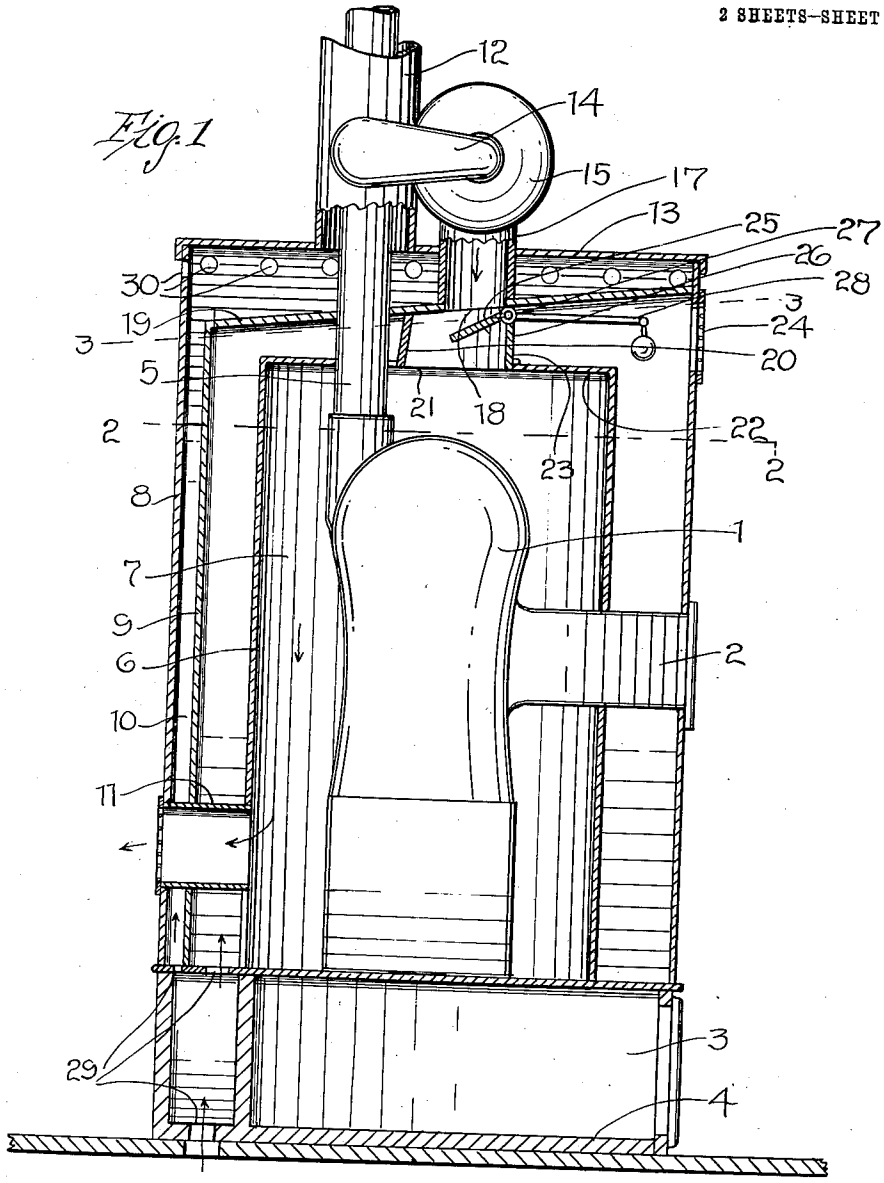
APPLICATION FILED FEB. 10, 1913.

1,074,194.

Patented Sept. 30, 1913.

2 SHEETS—SHEET 1.

Fig. 1



Witnesses

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2 SHEETS—SHEET 2.

Fig. 2

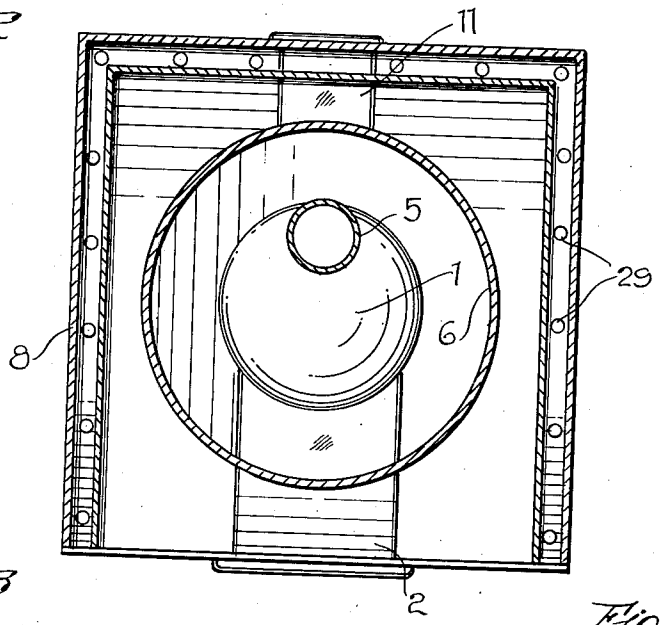


Fig. 3

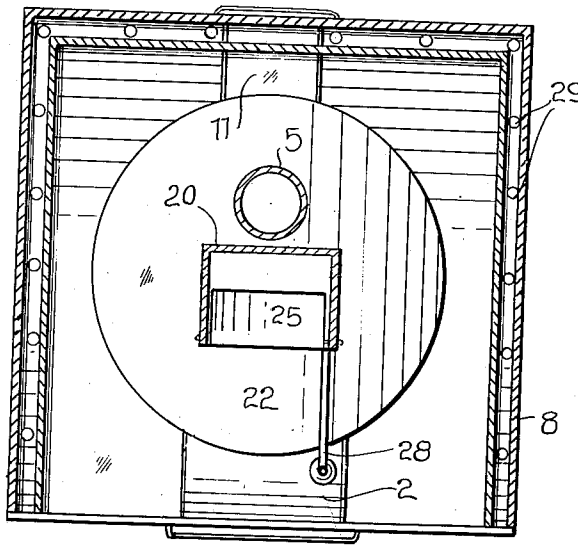
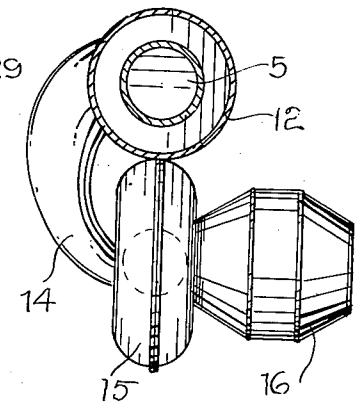


Fig. 4



Witnesses

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UNITED STATES PATENT OFFICE.

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HEATER.

1,074,194. Specification of Letters Patent. Patented Sept. 30, 1913.

Application filed February 10, 1913. Serial No. 747,543.

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 heaters of this type which are designed for use in electric railway or similar cars.

The invention further relates to heaters of that class in which there is maintained, as required, a forced ventilation by means of a fan driven by an electric motor, the fresh air in the present instance, in the operation of the device, being drawn in from above the roof of the car, which will insure its being relatively clean, so as to promote and maintain hygienic conditions, in contradistinction to those forced ventilation hot-air heaters in which the air is drawn in through the floor of the car, mixed with dust and dirt of the road bed.

The invention has for its primary object, in a heater of the character hereinbefore specified, an improved automatic damper which will prevent the heater from becoming heat bound when the fan or other forced ventilation apparatus is in an inoperative condition, the damper automatically opening upon the stopping of the fan, whereby the heat which would otherwise be retained within the casing or housing of the heater proper, or stove, will be permitted to radiate freely and thereby permit the stove to properly cool off.

The invention has for a further object a simple, durable and efficient construction of automatic damper for this purpose, the parts of which can be cheaply manufactured and readily assembled and installed, and which will not be liable to get out of order, requiring practically no attention in its operation and maintenance. And the invention also aims to generally improve devices of this class so as to render them more useful and commercially desirable.

With these and other objects in view, as will more fully appear as the description proceeds, the invention consists in certain constructions, arrangements, and combinations that I shall hereinafter fully describe and claim.

For a full understanding of the invention, reference is to be had to the following description and accompanying drawings, in which—

Figure 1 is a vertical longitudinal sectional view through an embodiment of my invention, parts being shown in side elevation. Fig. 2 is a horizontal sectional view, the section being taken substantially on the line 2—2 of Fig. 1. Fig. 3 is a similar view on the line 3—3 of Fig. 1. Fig. 4 is a top plan view of the fan casing and motor attached thereto, with the smoke pipe and fresh air pipe in section, illustrating the relative disposition of these parts and the flue which connects the fresh air pipe with the fan casing.

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 stove or heater proper, the same being of any improved construction or design and provided with the fuel intake 2 and the ash box or pit 3, the base 4 of which is, in the present instance, intended to be directly supported upon the floor of a car.

5 designates the smoke pipe of the stove which is provided with the usual dampers (not shown).

In carrying out my invention, I surround the body of the stove 1 with a casing 6 which may be of any desired shape (in the present instance cylindrical), and which is spaced from the wall of the stove so as to produce an air chamber 7 entirely surrounding the body portion of the stove. Encircling the cylindrical casing 6 is an outer wall or heat-insulating housing 8, which, in the present embodiment of the device, is rectangular, as best illustrated in Fig. 2, and is provided with a three-sided double wall 9 at the rear and adjoining sides so as to form an air space 10.

11 designates the outlet flue for the heated fresh air, said flue extending laterally from the casing 6 out through the surrounding walls and being disposed on any desired side of the heater.

Surrounding the smoke pipe 5, is a fresh air inlet pipe 12, which may be supported in any desired way upon the top 13 of the housing 8, and a flue 14 connects the fresh air inlet pipe 12 with the casing 15 of a centrifugal fan operated by a motor 16 which is also supported upon the top plate 13. Leading downwardly from the outlet port of the fan casing 15 is a fresh air feed flue 17 which extends down through the top plate 13 of the housing 8 and bounds or surrounds a fresh-air inlet opening 18 which is formed in the top 19 of the intermediate wall 9 which is spaced from the top 13, as clearly illustrated in Fig. 1. This flue 17 includes a downward extension 20 which leads from the opening 18 down to an opening 21 which is formed in the top 22 of the inner wall or casing 6.

From the description immediately preceding, it will be understood that in the operation of the fan, currents of fresh air will be drawn in and downwardly through the pipe 12, into the fan casing 15, and be forced downwardly through the flue 17 and its extension 20 directly into the chamber 7 which surrounds the stove 1, where these currents, or rather the constantly flowing current of fresh air, will be heated and will pass out through the outlet flue 11 into the car, or be distributed therein by any desired arrangement of radiator pipes (not shown).

The lower extension 20 of the flue 17 is formed in its vertical wall contiguous to one side of the fresh-air inlet opening 18 with a laterally facing vent opening 23 which is designed to establish communication between the chamber 7 and the interior of the wall 9, whereby under certain conditions, as will be hereinafter more fully specified, the heated air contained within the chamber 7 may circulate freely outward through a register plate 24 which, in the present instance, is secured to the front wall of the housing 8, as clearly indicated in Fig. 1.

A ventilating damper is designed to control the openings 18 and 23. This damper is, in the present embodiment of the apparatus, composed of two transversely extending plates, designated 25 and 26, which are disposed at an acute angle relative to each other and of a size, respectively, to close the openings 18 and 23, said damper plates being mounted to swing about a common axis 27 at the juncture of the openings 18 and 23 and being held by any desired number of weighted counter-balancing arms 28 in a position where the plate 25 will be against the opening 18 and the plate 26 will be spaced from the opening 23. But, it is to be noted, the downwardly flowing current of fresh air which is maintained by the fan, so long as the same is in operation, will hold said ventilating damper in the position illustrated in Fig. 1 of the accompanying drawings, with the plate 25 away from the opening 18 and with the plate 26 closing the opening 23. Thus, so long as the fan is operating, a continuous current of air will flow downwardly through the opening 18, past the ventilating damper and around the stove 1 to be heated, whence it will pass out from the flue 11, as before described. As soon as the fan stops, it is obvious that the downward current of fresh air will be interrupted, whereupon the counter-balancing arm or arms 28 will be permitted to act so as to move the damper to a position where the opening 18 will be closed and the opening 23 open, whereby the heated air from directly around the stove 1 may circulate freely out through the opening 23 and register plate 24 and relieve the congestion and prevent the stove from becoming heat bound. This result is the prime object attained by my invention.

In order to further prevent the stove from becoming heat bound, I preferably form in the floor of the car, openings which lead through the base 4 of the ash box and through the base of the body portion of the stove, as indicated at 29, whereby upwardly flowing currents of fresh air may pass around and through the spaces formed between the casing 6 and the intermediate wall 9 and between the latter and the housing 8, some of this fresh air escaping through orifices 30 that are formed in the sides and rear of the housing 8 above the rearwardly sloping top plate 19 of the intermediate wall 9, and some passing around the downward extension 20 of the flue 17 and out through the register 24.

From the foregoing description in connection with the accompanying drawings, the operation of my forced ventilation hot-air car heater will be apparent. In the practical use of the device, the fan, in its operation, will draw in fresh air above the roof of the car and force such air downwardly in the chamber 7 over, upon and around the stove 1, the air thus heated being passed out into the car through the outlet flue 11, and the ventilating damper hereinbefore described being held in a position to maintain the opening 18 open and the opening 23 closed, by the direct force of the air forced out of the fan casing 15. Immediately upon the stopping of the fan, the ventilating damper will move to a position where the opening 18 will be closed and the opening 23 open, consequently the air which would otherwise be bound or confined within the chamber 7 will be permitted to have free egress out through the opening 23 and register 24, while at all times both during the operation of the fan and after the fan has stopped, the upwardly flowing currents of fresh air, admitted through the openings 29, will maintain the spaces be-

tween the casing 6 and the intermediate wall 9 and between the latter and the housing 8 in properly cooled condition.

While the accompanying drawings illustrate what I believe to be the preferred embodiment of my invention, it is to be noted 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.

What is claimed is:—

1. A heater of the character described, including a heater proper, a casing extending around the same and forming a heating chamber, said chamber being provided with a heated air outlet flue and in its top with a fresh air inlet opening, a heat-insulating housing surrounding said casing and spaced therefrom, a forced draft device, a fresh air feed flue extending from the forced draft device down through the top of the housing and provided with a downward extension registering with the inlet opening in the heating chamber, said extension being provided with a lateral vent opening, and a ventilating damper embodying plates disposed in angular relation to each other and connected to move simultaneously about a common axis at the juncture of said lateral vent opening and the fresh air feed flue, and means connected to said damper tending to move said plates in a direction to cause one of them to extend across the fresh air feed flue and to open the lateral vent opening, as and for the purpose set forth.

2. A heater of the character described, including a heater proper, a casing extending around the same and forming a heating chamber, said chamber being provided with a heated air outlet flue and in its top with a fresh air inlet opening, a heat-insulating housing surrounding said casing and spaced therefrom, a forced draft device, a fresh air feed flue extending from the forced draft device down through the top of the housing and provided with a downward extension registering with the inlet opening in the heating chamber, said extension being provided with a lateral vent opening, and a ventilating damper embodying plates disposed in angular relation to each other and connected to move simultaneously about a common axis at the juncture of said lateral vent opening and the fresh air feed flue, means connected to said damper tending to move said plates in a direction to cause one of them to extend across the fresh air feed flue and to open the lateral vent opening, and a register connected to the wall of the housing in horizontal alinement with the lateral vent opening, as and for the purpose set forth.

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

WILLIAM F. PASCOE, Jr.

Witnesses:

Victor Braddock,

S. J. Minnich.