

July 8, 1947.

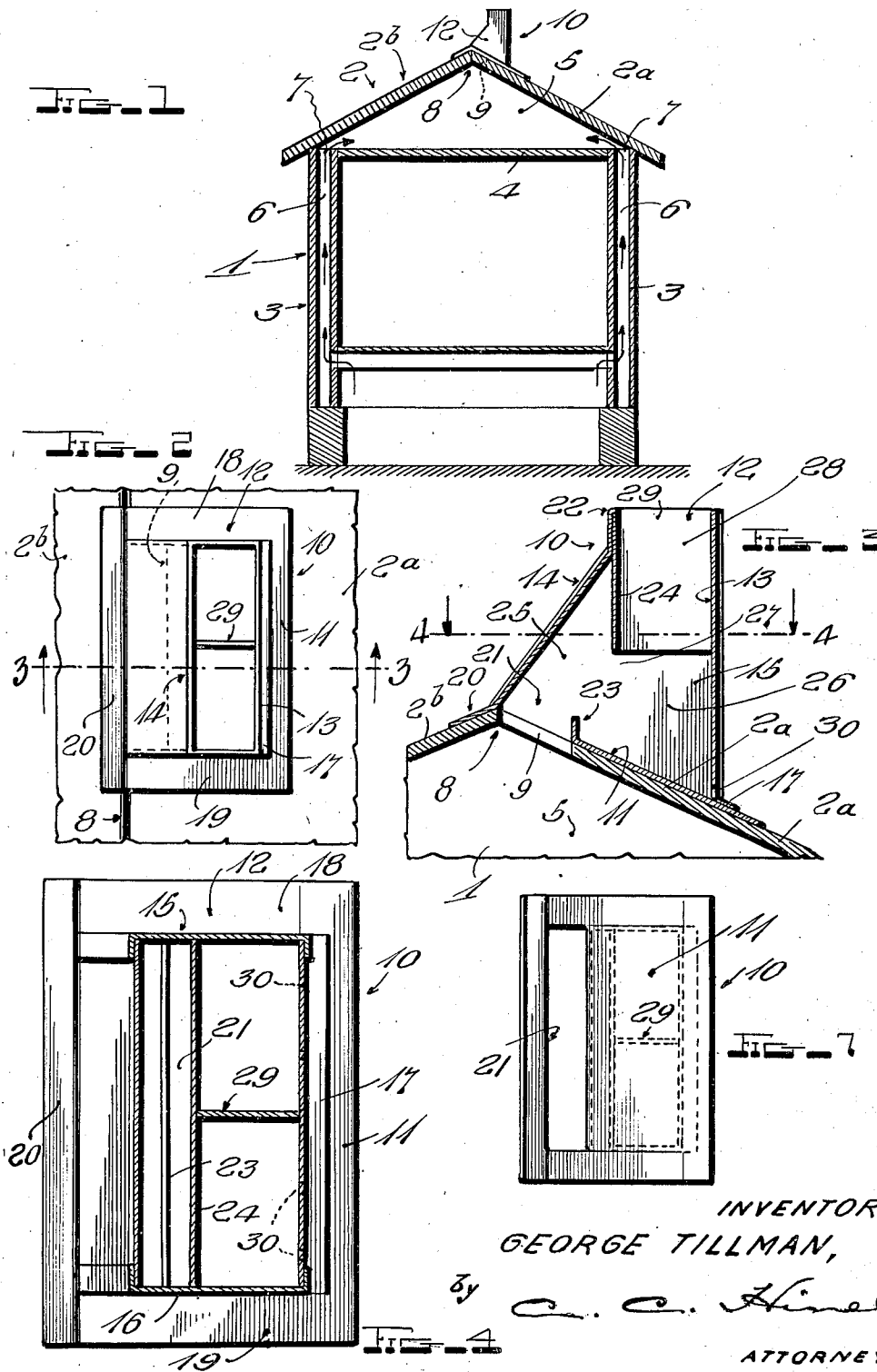
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2,423,739

VENTILATOR FOR BUILDINGS

Filed Feb. 19, 1945

2 Sheets-Sheet 1



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FIG. 5

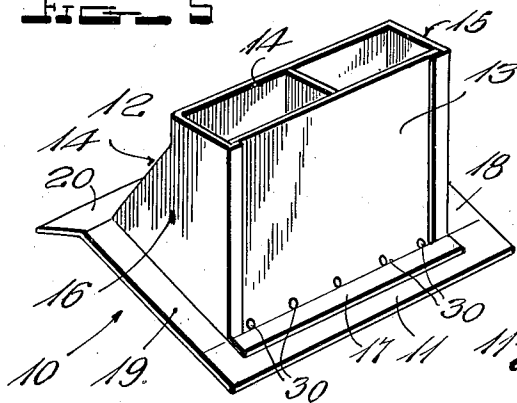


FIG. 6

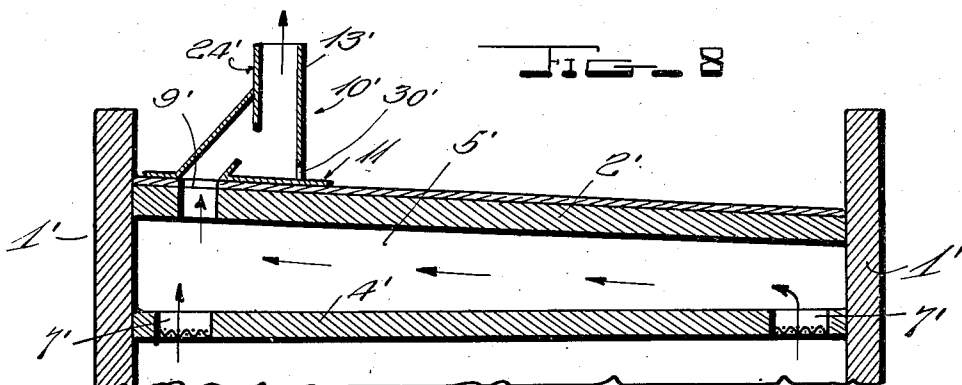
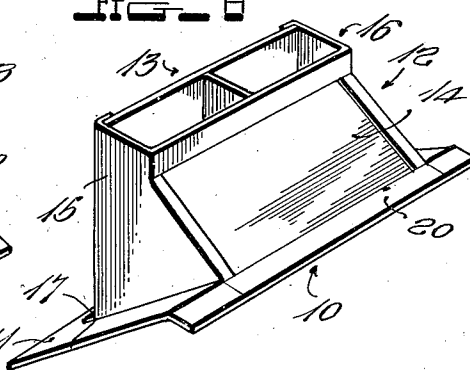


FIG. 8

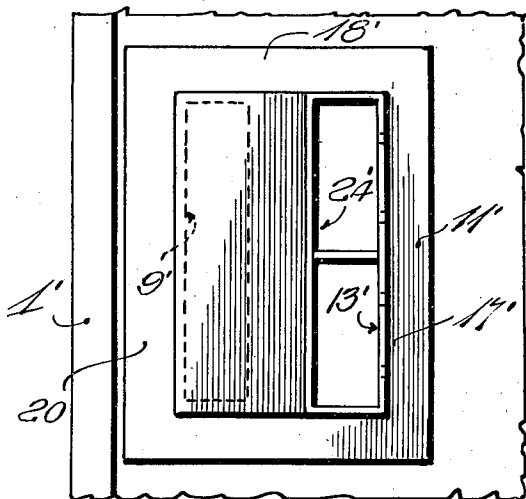
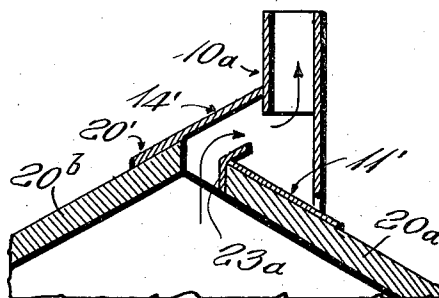


FIG. 10



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FIG. 11

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UNITED STATES PATENT OFFICE

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VENTILATOR FOR BUILDINGS

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5 Claims. (Cl. 98—42)

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This invention relates to ventilators for dwellings and other buildings, and its main object is to provide a ventilator of solar type, or one whose effective action is due wholly or largely to the heat of the sun, whereby a draft is induced to ventilate the building or any desired portion thereof to condition and keep the air in a wholesome state or cause a circulation to keep the building or a desired ventilated portion thereof cool.

Another object of the invention is to provide a ventilator adapted to be mounted on the roof of the building so as to be exposed to the heat of the sun for a draft-inducing effect, and which communicates through an air inlet in the roof with the interior of the building and is so constructed as to allow free flow of air from the building while protecting the building from access of rain, snow or other actions of the elements.

Still another object of the invention is to provide a ventilator which may be adapted to be mounted on either flat or gabled roofs, which may embody any desired number of ventilating flues, and used in any number according to the size of the roof, which will operate without fans or other power-driven air circulating devices, and which is of simple construction and adapted to be manufactured and sold at a comparatively low cost.

With these and other objects in view, the invention consists of the novel features of construction, combination and arrangement of parts, hereinafter fully described and claimed, reference being had to the accompanying drawings, in which:

Figure 1 is a view in section of the upper part of a building having a gabled roof and showing in elevation a ventilator of suitable form, and embodying the invention, mounted thereon.

Figure 2 is a top plan view of a portion of the roof and the ventilator shown in Figure 1.

Figures 3 and 4 are sections taken, respectively, on the lines 3—3 and 4—4 of Figures 2 and 3.

Figures 5 and 6 are perspective views looking toward opposite ends and sides of the ventilator.

Figure 7 is a bottom plan view of the ventilator.

Figure 8 is a vertical section through the upper portion of a building having a flat roof and showing a modified form of the ventilator applied thereto.

Figure 9 is a plan view of the ventilator shown in Figure 8.

Figure 10 is a view showing still another modified form of ventilator for a gabled roof.

Referring now more particularly to Figures 1

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to 7, inclusive, of the drawings, 1 designates a building having a gabled roof 2 and which, as shown, includes walls 3 and an upper ceiling 4, between which roof and ceiling is an attic or air circulating chamber or space 5. In this disclosure one or more of the walls 3 may be hollow to provide an air circulating duct or ducts 6 having at their upper ends outlets 7 leading to the chamber 5, and which may communicate at their lower ends with a cellar (not shown) or with some other portion of the building in which the air is cool relative to that normally contained in chamber 5. The duct or ducts may in practice be provided with dampers or other conventional means for controlling the flow of air there-through, if desired.

Formed in the section 2a of the roof 2, preferably at or adjacent to the highest point or apex 8 of the roof, is a vent aperture or passage 9 communicating with the chamber 5, and mounted on sections 2a and 2b of the roof for cooperation with said aperture is a ventilator 10 embodying the novel features of my invention and the construction of which I will now proceed to describe.

The ventilator 10, which is of oblong rectangular form in plan and of unitary construction and made of strong and durable heat-absorbing material, such as galvanized sheet metal, comprises a base plate 11, and a body 12. The body 12, which is generally of the form of a truncated scalene triangle, comprises the side walls 13 and 14 and the end walls 15 and 16, which are lapped and soldered or otherwise suitably joined at their adjacent edges, said walls terminating at their bases in outwardly projecting flanges 17, 18, 19 and 20. In the illustrated embodiment shown in Figures 1 to 7 inclusive, the flanges 17, 18 and 19 of the walls 13, 15 and 16 project outward at right angles therefrom and are soldered or otherwise rigidly joined to the base plate, while the flange 20 and adjacent ends of the flanges 18 and 19 are bent outwardly beyond the wall 14 at less than a right angle and are soldered or otherwise rigidly joined together.

The construction of the ventilator as thus far described provides a strong and rigid type of ventilator whose body, stack or flue portion is materially wider at its base or inlet than at its top or outlet and also materially wider at its base than the vent aperture or passage 9. The form of the ventilator described is such as to adapt it to rest mainly on the roof section 2a with the flange 20 and ends of the flanges 18 and 19 joined thereto lapping over upon the roof section 2b so as to dis-

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pose the base of the wall 14 substantially in line with the roof ridge or apex 8 and adjacent side of the aperture 9, and so that the flange 20 forms a support to assist in holding the ventilator in place on the roof and against downward sliding motion on the roof section 2a. In addition, of course, suitable fastening means passing through the respective flanges and engaging the roof may be employed to firmly fasten the ventilator in position on the roof against any possibility of casual displacement.

It will be observed that the base plate 11 is of less width than the base of the body 12 and that its inner edge terminates a distance from and in spaced relation to the base of the wall 14, whereby an intervening passage 21 is formed which overlies and registers with the aperture 9 and is co-extensive in size therewith. Also it will be observed that the wall 13, which is inclined upwardly and inwardly at a sharper angle than the wall 14, extends continuously in a straight line from the base plate to the top of the ventilated body, while the body of the wall 14 terminates below the top of the ventilator body and has its top portion bent outward, as at 22, at a reverse angle to its body portion and substantially parallel with the upper portion of the wall 13. This inner edge is bent upward to form a guard flange or deflector 23. By this construction the body 12 is disposed at such an angle of inclination to the roof section 2a and base plate 11 as to dispose its upper outlet end in a vertical or substantially vertical position, while its wall 14 is disposed so that it inclines inwardly and upwardly to bring the upper edge of its body portion over and about in line with the longitudinal center line of the passage 21. As a result of the construction described the passage 21, which overlies the aperture 9, is arranged at one side of the longitudinal center of the base of the ventilator body 12 and between the same and the base of the wall 14. This wall 14 has fixed to its flanged portion 22 a baffle plate or deflector 24, which is preferably integral therewith and extends downwardly therefrom at a reverse angle to the body of the wall 14 and parallel with the wall 13, said plate terminating above the plane of the base plate 11 and above and in line with the flange 23 and coacting therewith to divide the base of the ventilator body into an inlet compartment 25 communicating with the passage 21 and an outlet compartment 26 connected therewith by a lateral passage 27, which outlet compartment in turn communicates with the relatively narrowed or constricted vent passage 28 formed between the baffle or deflector plate 24 and the opposed upper portion of the wall 13. In practice this passage 28 may be divided by partition plates 29 (one of which is shown) into any desired number of smaller passages, according to the length of the ventilator employed. Also in practice any of the passages referred to may be provided with dampers or other means for controlling the flow of air therethrough and any number of ventilators may be used on a roof according to ventilation requirements.

It will be evident that the form of the ventilator and inclination of its walls provide, even in a small ventilator, a large extent of surface exposed to the rays of the sun to absorb heat therefrom and extract heat from the roof.

In the operation of the device, the heat of the sun absorbed by the ventilator induces a draft therethrough whereby the heated air which has risen through the ducts into the chamber, and

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which has absorbed heat from the roof, is drawn upwardly into and discharged through the ventilator to the outer atmosphere. Cooler air is thereby drawn from the cellar or other lower portions of the building and passes into the chamber 5 and thence out through the ventilator, whereby the air throughout the building is kept in a relatively cool state and fresh air constantly circulated to purify the contained air and keep it in a wholesome state. This is effected without the use of fans, pumps or other air circulating means and without cost to the user, except the initial cost of installation of the apparatus. The device will be thoroughly effective for this purpose in summer and may be used in winter in a heated house, by the use of dampers, to circulate just enough air to keep the air in the building fresh and pure. It will be noted that by the described construction of the ventilators the inlet and outlet compartments 25 and 26 are offset from one another and connected by the lateral passage 27, and that the compartment 25 is guarded against the entrance of rain, snow, sleet or wind by the deflectors 23 and 24, so that no moisture can enter the chamber 5, any moisture which may enter through the top of the ventilator being directed into the compartment 26. To allow this moisture to discharge and keep the compartment clear, drain outlets 30 at the bottom of the wall 13 are provided which may be in size and number sufficient to allow the moisture to discharge as fast as accumulated. As the ventilator is simple in construction and may be easily installed economy in the installation and use of the apparatus is ensured.

In Figure 8 is disclosed a slightly modified form of ventilator 10' for use upon a building 1' having a flat roof 2'. In this construction the ceiling 4' is shown as having registers 7' or like outlets for air passing from the building into the space or chamber 5' between the ceiling and roof and the sloping roof is shown as provided at its highest point with the vent passage 9' communicating with the ventilator. The ventilator here is similar in construction to that disclosed in Figures 1-7 except that its base plate 11' and the base flanges 17', 18', 19' and 20' are flat to rest squarely on the roof, and the wall 13', upper part 22' of wall 13' and baffle plate 24' are straight and parallel with each other and arranged relatively to the base plate to dispose the body 12' in a substantially upright position. Otherwise the construction of the ventilator 10' is the same as ventilator 10 and provided with corresponding parts which, like the above described parts, are designated by similar primed reference numerals.

Figure 10 shows a modified form of ventilator 10a which is similar in general construction to the ventilator 10' but is adapted, like the ventilator 10, to be used on a gabled roof. The same reference characters are used in Figure 10 to designate those parts in ventilator 10a corresponding or substantially corresponding to similar parts of ventilator 10'. The ventilator 10a is mounted on a roof similar to that shown in Figures 1 to 4, inclusive, and the main difference between the same and the ventilator 10' resides in a change in the angles of inclination of the base plate 11' and wall 14' and form of the flange 20' to suit a gabled roof, the plate 11' and flange 20' being formed to rest on the roof sections 20a and 20b. Also ventilator 10a is provided with a holding flange 23a depending into the aperture 9 to assist in holding the ventilator in position. This form of ventilator may be employed in place

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of ventilator 10 on a gabled roof when desired.

From the foregoing description, taken in connection with the drawings, the construction, mode of operation and advantages of my solar ventilator will be readily understood and appreciated by those versed in the art without a further and extended description. While the structures disclosed are preferred, the invention is not limited thereto, as changes in the form, proportion and construction of the ventilator, to meet varying conditions of service, may be made within the scope of the appended claims without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus described my invention, I claim:

1. A ventilator of the character described comprising an oblong rectangular body of truncate-triangular form in cross section and including a bottom, side walls and end walls and having an air inlet compartment opening outward through its bottom, an air outlet compartment opening outward through its top said compartments being arranged out of vertical alinement with each other, a partition extending upwardly from its bottom and separating the lower portions of the compartments, a partition extending downwardly from its top and disposed in spaced relation to the first-named partition, to form therewith a passage between the compartments above the bottoms thereof, the second-named partition serving as a deflector to direct any moisture entering the top of the air outlet compartment toward the bottom of said compartment, and drain outlets from the air outlet compartment arranged below the level of said passage.

2. A ventilator of the character described comprising a body of unitary construction and of substantially oblong rectangular form in plan and of truncate-triangular form in cross section, said body being formed of a bottom wall, a straight side wall, a side wall inclined upwardly and inwardly toward the straight side wall and being shorter than the latter and terminating below the top thereof, and straight parallel end walls equal in height to the straight side wall, said walls forming air inlet and outlet compartments located respectively on opposite sides of the vertical longitudinal center of the body and between the same and said straight and inclined side walls, a short vertical wall arranged parallel with the upper portion of the straight side wall and connected with and extending downwardly from the upper edge of the inclined side wall and forming with said upper portion of the straight side wall a restricted air outlet depending into and leading upwardly from the air outlet compartment to the atmosphere at the top of the body and also forming a partition extending downwardly into the body between the upper portions of the air inlet and outlet compartments, the bottom wall being provided with an air inlet opening into the base of the air inlet compartment and having a flange extending upwardly therefrom at its side facing the air outlet and forming with said partition a restricted lateral passage connecting the air inlet compartment with the air outlet compartment below the level of the depending inlet end of the restricted air outlet.

3. A ventilator of the character described comprising a body of unitary construction and of substantially oblong rectangular form in plan and of truncate-triangular form in cross section, said body being formed of a bottom wall, a straight side wall, a side wall inclined upwardly and inwardly toward the straight side wall and being

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shorter than the latter and terminating below the top thereof, and straight parallel end walls equal in height to a straight side wall, said walls forming air inlet and outlet compartments located respectively on opposite sides of the vertical longitudinal center of the body and said straight and inclined side walls, a short vertical wall arranged parallel with the upper portion of the straight side wall and connected with and extending upwardly and downwardly from the upper edge of the inclined side wall and forming with said upper portion of the straight side wall a restricted air outlet depending into and leading upward from the air outlet compartment to the atmosphere at the top of the body and also forming a partition extending downwardly into the body between the upper portions of the air inlet and outlet compartments, the bottom wall being provided with an air inlet opening into the base of the air inlet compartment and having a flange extending upwardly therefrom at its side facing the air outlet compartment and forming with said partition a restricted lateral passage connecting the compartments below the level of the depending inlet end of the restricted air outlet, and flanges extending outwardly from the side and end walls of the body for attaching the same to a roof.

4. A ventilator of the character described comprising a body of unitary construction and of substantially oblong rectangular form in plan and of truncate-triangular form in cross-section, said body being formed of a bottom wall, a straight side wall, a side wall inclined upwardly and inwardly toward the straight side wall and being shorter than the latter and terminating below the top thereof, and straight parallel end walls equal in height to the straight side wall, said walls forming air inlet and outlet compartments located respectively on opposite sides of the vertical longitudinal center of the body and said straight and inclined side walls, a short vertical wall arranged parallel with the upper portion of the straight side wall and connected with and extending upwardly and downwardly from the upper edge of the inclined side wall and forming with said upper portion of the straight side wall a restricted air outlet depending into and leading upward from the air outlet compartment to the atmosphere at the top of the body and also forming a partition extending downwardly into the body between the upper portions of the air inlet and outlet compartments, the bottom wall being inclined upwardly and inwardly at an angle to the vertical plane of the body and being provided with an air inlet opening into the base of the air inlet compartment and having a flange extending downward below the plane of the bottom wall and a flange extending upwardly at its side facing the air outlet compartment and forming with said partition a restricted lateral passage connecting the compartments below the level of the depending inlet end of the restricted air outlet, and flanges at the base of the body for attaching the same to a roof.

5. A ventilator of the character described comprising a body of unitary construction and of substantially oblong rectangular form in plan and of truncate-triangular form in cross-section, said body being formed of a bottom wall, a straight side wall, a side wall inclined upwardly and inwardly toward the straight side wall and being shorter than the latter and terminating below the top thereof, and straight parallel end walls equal in height to the straight side wall, said

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walls forming air inlet and outlet compartments located respectively on opposite sides of the vertical longitudinal center of the body and said straight and inclined side walls, a short vertical wall arranged parallel with the upper portion of the straight side wall and connected with and extending upwardly and downwardly from the upper edge of the inclined side wall and forming with said upper portion of the straight side wall a restricted air outlet depending into and leading upward from the air outlet compartment to the atmosphere at the top of the body and also forming a partition extending downwardly into the body between the upper portions of the air inlet and outlet compartments, the bottom wall being inclined upwardly and inwardly to the vertical plane of the body between the straight and inclined side walls and being provided with an air inlet opening into the base of the air inlet compartment and having a flange extending upwardly therefrom at its side facing the air outlet compartment and forming with said partition a restricted lateral passage connecting the compart-

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ments below the level of the depending inlet end of the restricted air outlet, and attaching flanges projecting outwardly from the bases of the side and end walls, the flange projecting from the base of the inclined side wall being inclined at an outward and downward angle thereto.

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