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2,184,110

AIR CONDITIONING SYSTEM

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2 Sheets-Sheet 1

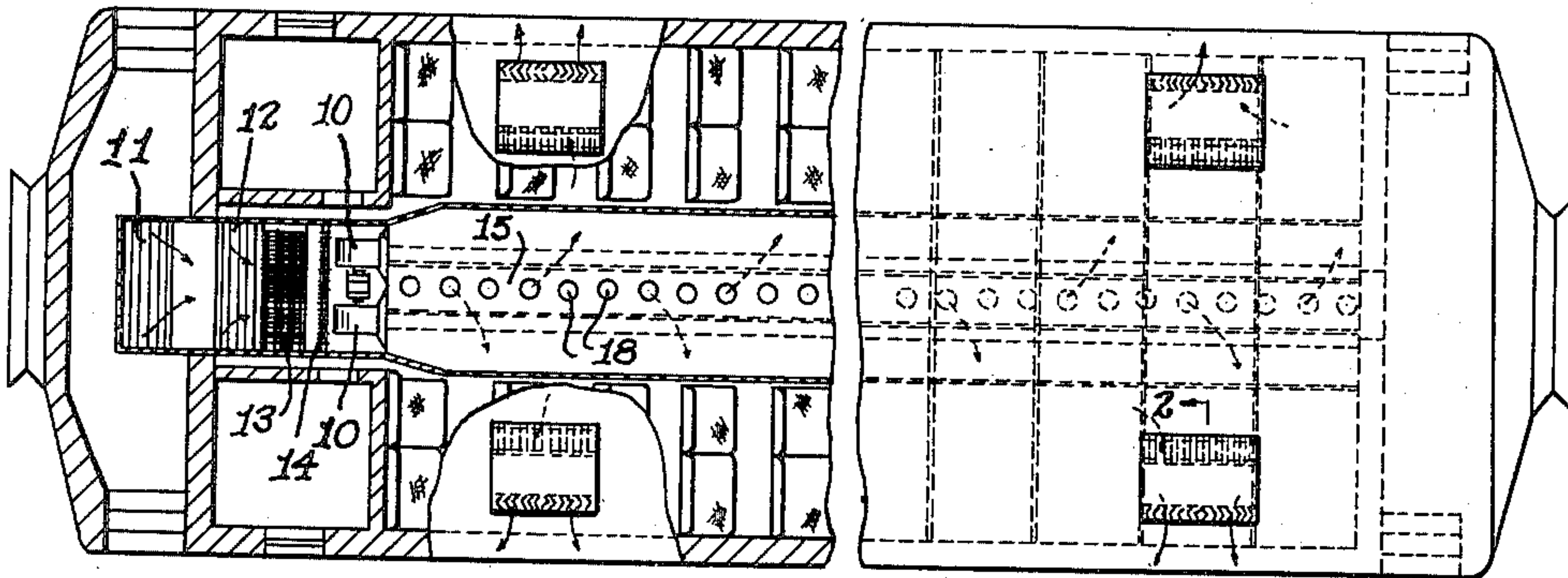


Fig. 1-

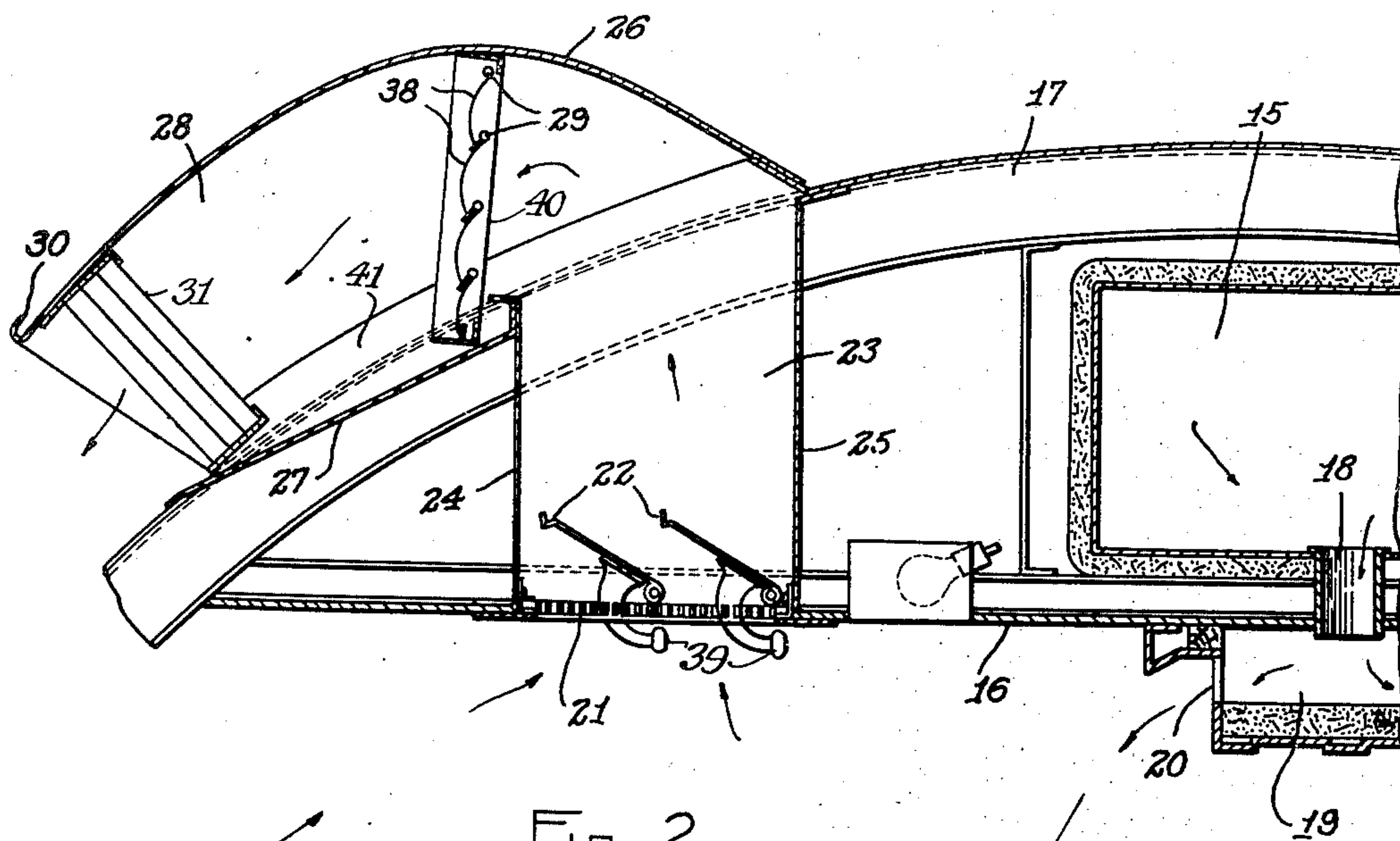


Fig. 2-

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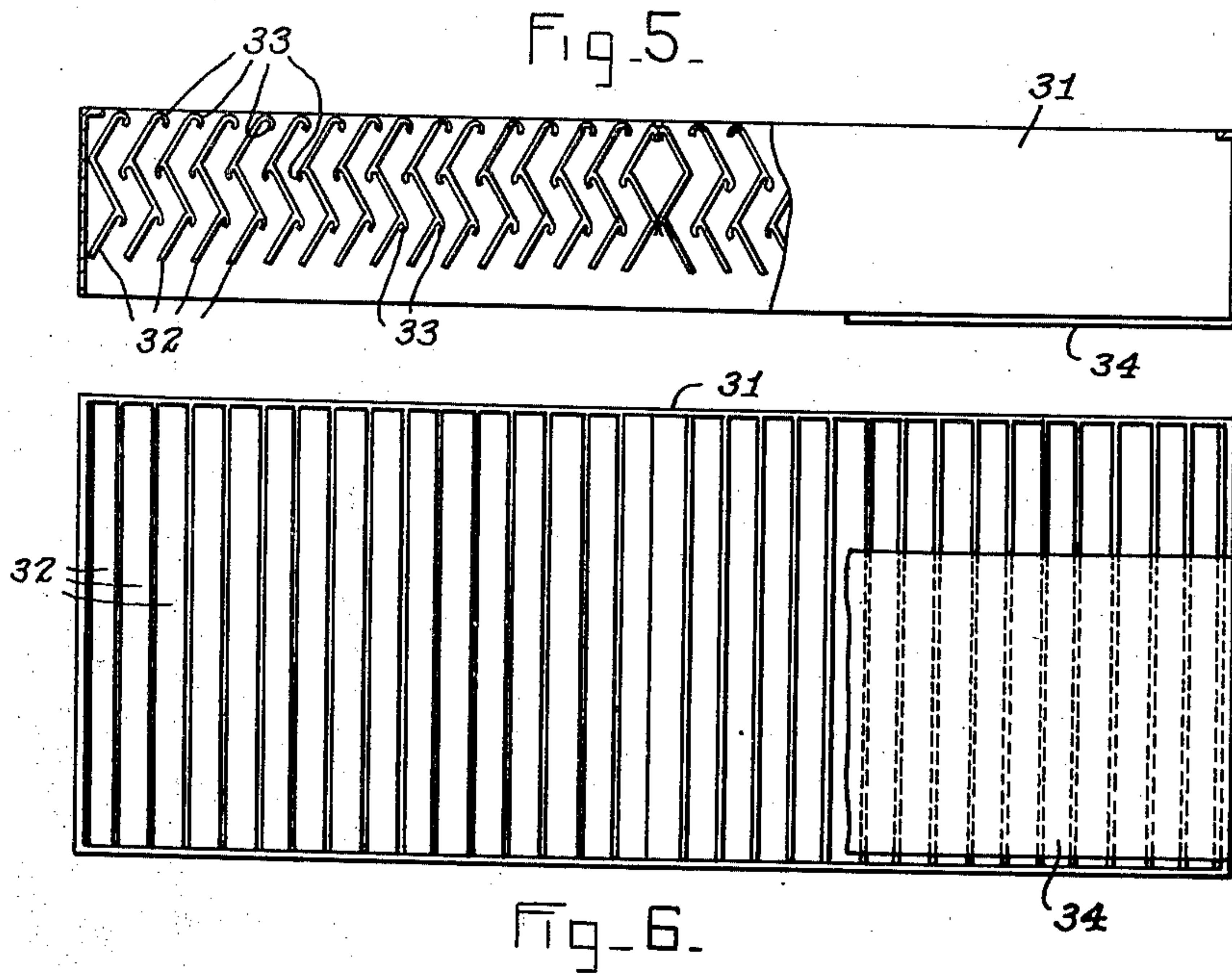
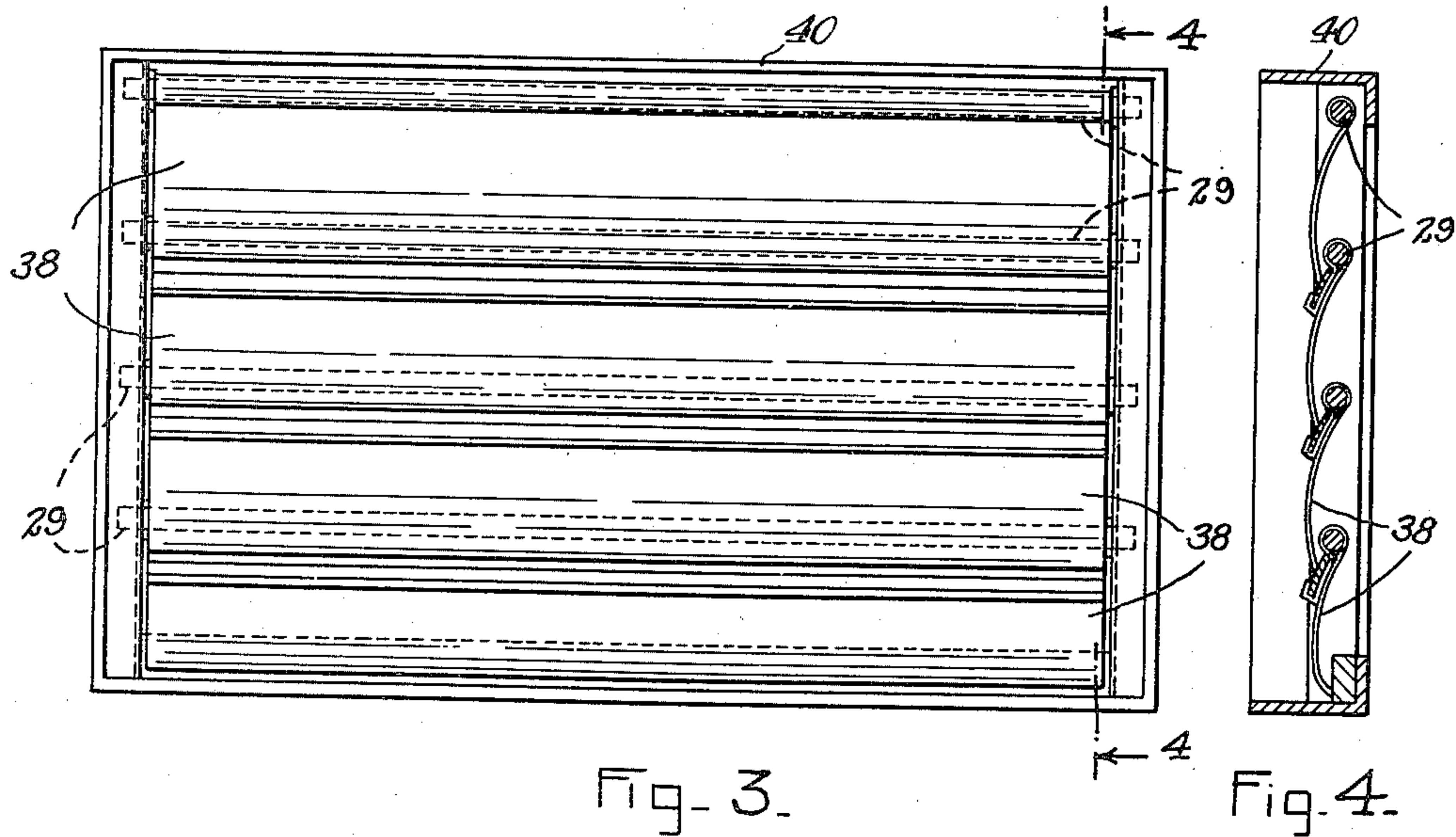
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AIR CONDITIONING SYSTEM

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2 Claims. (Cl. 98—19)

This invention relates to ventilators and relates more particularly to ventilators which may be used in air conditioned passenger vehicles.

Ventilators are used in railway passenger cars for exhausting what might be called "used air" from the cars. This invention provides exhaust ventilators which incorporate the following features: The larger volumes of air resulting from evaporative cooling and from pressure ventilating are provided for. The ventilators include balanced dampers which prevent outside air from entering the car through the ventilators and which adjust themselves to pass out any volume of indoor air. They are adaptable to late designs of rounded roofs. They include means for preventing rain water from entering the car. They may be used to ventilate the space between the car ceiling with cooler air from the passenger space. Outlets in the car ceiling communicate with the dampers and contain adjustable dampers.

An object of the invention is to provide an improved exhaust ventilator for railway passenger cars.

Other objects of the invention will be apparent from the following description taken together with the drawings.

The invention will now be described with reference to the drawings, of which:

Fig. 1 is a plan view looking upwardly, with a portion in section, at the ceiling of a railway passenger car embodying the present invention;

Fig. 2 is a sectional view along the lines 2—2 of Fig. 1;

Fig. 3 is a view looking from the outside of the balanced dampers of Fig. 2;

Fig. 4 is a sectional view along the lines 4—4 of Fig. 3;

Fig. 5 is an end view with a portion in section of the eliminators of Fig. 2, and

Fig. 6 is a plan view looking upwardly upon the eliminator of Fig. 5.

Referring first to Fig. 1 which illustrates the lay-out of a complete air conditioning system embodying this invention, the blowers 10 draw fresh air through the vestibule inlet 11 and recirculated air through the inlet 12, pass it over the coils 13 and 14 and then force it into the longitudinal duct 15.

As shown by Fig. 2, the duct 15 is mounted between the ceiling 16 and roof 17 of the car and has the outlets 18 which extend through the ceiling 16 to discharge the air into the lower duct 19 from which it is discharged through the outlets 20 into the passenger space.

Cold air from the passenger space passes upwardly through the grilles 21 mounted in the ceiling 16, past the dampers 22 having hand operated handles 39, into the passages 23 which extend between the walls 24 and 25 through the roof 17 of the car.

The curved hoods 26 extend over the passages 23 and down over the roof of the car and form with the bottom plates 27, the passages 28 which extend into the atmosphere. The outer end of each hood is turned up to provide the gutter 30. The plates 27 are in recesses below the roof line 41 and terminate at their inner ends at the walls 24 and are slanted downwardly to provide drainage for the passages 28.

In the passages 28 are mounted substantially vertical frames 40 which contain the plurality of superimposed dampers 38 which are pivoted at 29 and which over-lap to close off the passages 28. Each set of dampers 38 is mounted along a line tilted towards the center of the car as shown by Fig. 2 so that the weight of the dampers tends to maintain them closed. The dampers 38 are so adjusted that the air through the passages 23, when the blowers 10 are operating, move the dampers towards open position to permit the escape of this air. Air tending to enter the car as under wind pressure, through the passage 28 automatically closes the dampers 38.

In the outer portions of the passages 38 are mounted the eliminators 31, the details of which are shown by Figs. 5 and 6. These eliminators contain the plurality of upwardly extending, zig-zag plates 32 provided with hooks 33, which catch entrained water such as rain water attempting to enter the car, which water drains down the eliminator plates onto the plate 27 and thence from the car.

Normally in the heating season only five hundred cubic feet of air per minute will be discharged from the car and as the exhaust ventilators are designed to exhaust much larger volumes of air, the plates 34 (Figs. 5 and 6) are provided to be mounted on the back sides of the eliminators 31 for plugging up substantially two-thirds of the air outlet area.

In the cooling season, an air washer may be employed for evaporative cooling, in which case all outside air and no recirculated air would be passed through the system, in which case several times as much air will be exhausted from the exhaust ventilators as during the heating season. The plates 34 are removed and the dampers 38 automatically adjust themselves for the greatly increased air volume.

Likewise, the exhaust ventilators of the invention may be used in pressure ventilation systems in which relatively large volumes of air are exhausted from the car.

5 It may be desired to have the cool exhaust air from the passenger space, cool the space between the ceiling 16 and roof 17, and cool the duct 15 by passing over and around it, in which case the walls 24 and 25 may be omitted.

10 While one embodiment of the invention has been described for the purpose of illustration, it should be understood that the invention is not limited to the exact apparatus and arrangement of apparatus described, as many departures
15 therefrom may suggest themselves to those skilled in the art without departing from the spirit of the invention.

What is claimed is:

1. An exhaust air ventilator for a railway
20 passenger car having a roof and having an opening in the roof to one side of the center thereof for the exhaust of air from said car, comprising a curved hood having one end terminating at
25 said roof adjacent the inner edge of said opening, said hood extending over said roof down

along same towards the side of said car nearest said opening and having its other end, spaced from said roof to form an air outlet to the atmosphere, and a substantially flat member having one end terminating adjacent the outer
5 edge of said opening and having its other end at a lower level, said member extending underneath said hood and forming with same, an exhaust air passage above said roof, said other
10 end of said hood being turned upwardly to form a gutter.

2. An exhaust air ventilator for a railway passenger car having a roof and having an opening in the roof to one side of the center thereof
15 for the exhaust of air from said car, comprising a curved hood having one end terminating at said roof adjacent the inner edge of said opening, said hood extending over said roof down
20 along same towards the side of the car nearest said opening and forming at its other end an exhaust outlet above said roof, and means forming an upwardly curved gutter on the upper
25 edge of said other end of said hood.

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