Aug. 3, 1926. 1,594,894

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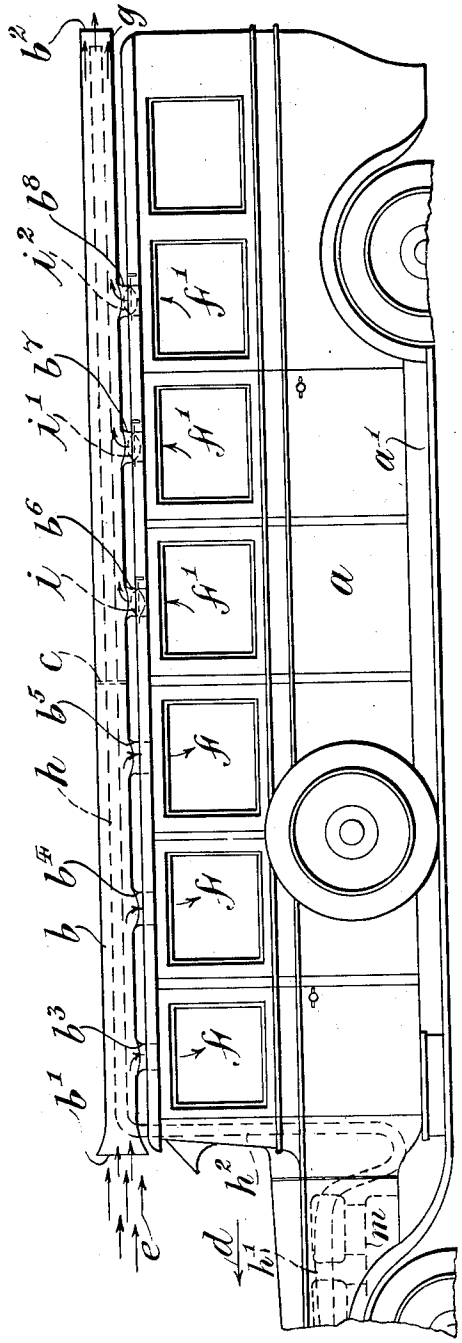
VENTILATING AND HEATING MEANS FOR INCLOSED VEHICLES

Filed Nov. 10, 1924



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Patented Aug. 3, 1926. 1,594,894

UNITED STATES PATENT OFFICE.

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VENTILATING AND HEATING MEANS FOR INCLOSED VEHICLES.

Application filed November 10, 1924. Serial No. 749,098.

This invention relates to devices for ventilating closed vehicles particularly of the passenger carrying type. It has heretofore been the practice in the ventilation of closed vehicles to provide in many instances, devices which, in evacuating the vitiated air, create a partial vacuum within the vehicle. This practice was objectionable because while the partial vacuum induced the replacement of the vitiated air by fresh air within the body it also induced the seepage of dust through cracks, fissures or other openings along with the incoming fresh air. It is an object of the present invention to prevent this seepage of dust into the interior of the body as a result of the ventilation thereof. To this end the method of ventilating the body according to the present invention involves the forcing of fresh air into the body and the creation and maintenance of a pressure therewithin which is greater than that of the surrounding atmosphere, whereby no seepage of dust, etc. is permitted. More particularly advantage is taken of the forward motion of the vehicle to induce a continuous flow of air into the forward part of the interior of the body to result in an increase of pressure therewithin which forces the vitiated air out of the body through vents provided for that purpose. This action may be further abetted by the creation of a partial vacuum in the vents which are arranged in such manner that the creation of such vacuum is a natural consequence of the forward motion of the vehicle. If desired, heat may also be availed of to augment the production of the desired pressure. An embodiment of the invention by which the method may be practiced may take the form of a tube open at both ends, extending longitudinally the length of the body and disposed in the upper part thereof. It is in communication with the interior of the vehicle through ducts and vents or the like, the vents being controlled by a plurality of valves or shutters whereby the degree of pressure within the body may be controlled. Upon the forward motion of the vehicle air is forced into the forward end of the tube and is constrained to flow through the ducts into the interior of the vehicle to build up a pressure therein which forces the vitiated air out through the vents at the other end of the tube. By the maintenance of such pressure within the interior of the body inwardly moving currents of air or drafts through the cracks or other openings which would carry with them dust and the like are prevented. The ventilating means may also be availed of to heat the interior of the vehicle. In the preferred embodiment exhaust gases may be led through a conduit in the tube, whereby heat is imparted to the air being forced into the body which has the further advantage of increasing the pressure within the vehicle due to the expansion of the air. At the rear end of the tube the conduit is cut off to form a nozzle so that upon the exit of the exhaust gases therefrom a partial vacuum may be created at that point to assist in the expulsion of the vitiated air. A preferred embodiment of the invention as applied to enclosed motor buses will now be described with reference to the accompanying drawings in which:—

The figure is a view showing conventionally a passenger vehicle to which is applied the ventilating device according to the invention wherein heat is availed of to facilitate the ventilation of the body.

Referring to the figure the passenger compartment a of a motor vehicle indicated in general at a' is adapted to be supplied with fresh air and to have vitiated air withdrawn therefrom by the ventilating device according to the present invention. At the top of the vehicle a tube b is shown extending longitudinally of the body and open at both ends as at b', b^2, respectively. Extending between the tube and the interior of the body are a plurality of ducts, in the illustrated embodiment six in number b^3, b^4, b^5, b^6, b^7 and b^8. It is intended that the first three of these ducts b^3, b^4, b^5, constitute means to permit the entrance of air into the interior of the vehicle, while the last three b^6, b^7 and b^8 may be availed of as desired to permit the exit of vitiated air. Inasmuch as it is desired to build up and maintain a pressure greater than that of the surrounding atmosphere within the interior of the vehicle the outlet passages are adapted to be controlled by means of valves or other devices, shown in the figure as shutters i, i' and i^2. In operation, as the vehicle moves forwardly in the direction indicated by the arrow d, air is caused to enter the mouth b' as shown by the arrows e at that end of the tube and is conducted downwardly into the interior

of the vehicle through the ducts b^3, b^4, b^5. Most advantageously a baffle c may wholly or partly close the tube b between say the last inlet b^5 and the first outlet b^6 to contribute to directing the incoming air through the inlets into the body. Thus a pressure is created within the vehicle greater than that of the surrounding atmosphere which constantly tends to build up due to the continued influx of air through the tube b. The forward motion of the vehicle also has a tendency to create a partial reduction of pressure at the rear end b^2 of the tube b and the pressure differential thus established between the interior of the vehicle and the exit b^2 of the tube induces a flow of air from the forward part of the vehicle as at f to the rearward portion as at f' and an upward and outward movement of the vitiated air at f' through the vents b^6, b^7 and or b^8 (depending, of course, upon which of the shutters i, i' and i^2 are closed) and out through the end b^2 of the tube b as indicated by the arrows g. Due to the higher-than-atmospheric pressure of the air within the vehicle any possibility of a seepage of dust into the interior of the vehicle through cracks or openings in the body is precluded. If desired, of course, a dust screen may be installed in the mouth b' of tube b.

Means are illustrated for heating the air supplied to the interior of the vehicle not only to raise the temperature of the body in the interest of the comfort of the passengers but also to assist in creating the desired pressure therein due to the action of the heat in expanding the air. In the illustrated embodiment the heating of the air is effected by conducting the exhaust gases through a conduit h extending longitudinally within the tube and in communication with the exhaust manifold h' of the motor through a vertically extending duct h^2. The air entering through the mouth b' of tube b comes into contact with pipe h through the medium of which it absorbs some of the heat of the exhaust gases flowing therethrough. Due to the increase of temperature thus effected the air expands to create a further increase of pressure as it enters the interior of the vehicle. Pipe h may extend to within a short distance of the rear end of the tube b and form therewith a nozzle, the action of which assists in expelling vitiated air from the rear end of the tube on the common principle of the ejector.

The operation of the device will be apparent from the foregoing description. Because of the inertia of the air within the vehicle the forward motion thereof will cause a building up of pressure within the vehicle upon the flow of air into the mouth of the ventilating tube and the addition of heat to the air in the forward part of the tube will further increase the pressure of this air and assist in obtaining the desired result. The maintenance within the vehicle of a pressure greater than that of the atmosphere will prevent the seepage of dust through openings in the vehicle body.

Various modifications may be made in the shape and disposition of the ventilating tube as well as in the number and distribution of the passages connecting the tube with the interior of the vehicle and in the means associated with the tube or passages to control the flow of air as well as in the method of supplying heat to the air in the forward part of the tube. The terminology in the foregoing description has been used in a descriptive rather than a limiting sense and no limitation is intended thereby except as indicated in the appended claim.

What I claim is:—

The combination with an inclosed vehicle, of ventilating means comprising a longitudinally extending tube open at both ends, ducts connecting the interior of the vehicle with the interior of the tube, means to control the flow of air in certain of the ducts, and a conduit to conduct exhaust gases through the interior of the tube, the rear end of said tube and conduit forming an ejector for the air in the tube.

This specification signed this 6th day of Nov. A. D. 1924.

ALFRED F. MASURY.