J. C. STROH.

VENTILATING SYSTEM.

APPLICATION FILED APR. 23, 1909.

976,229.

Patented Nov. 22, 1910.

2 SHEETS—SHEET 1.

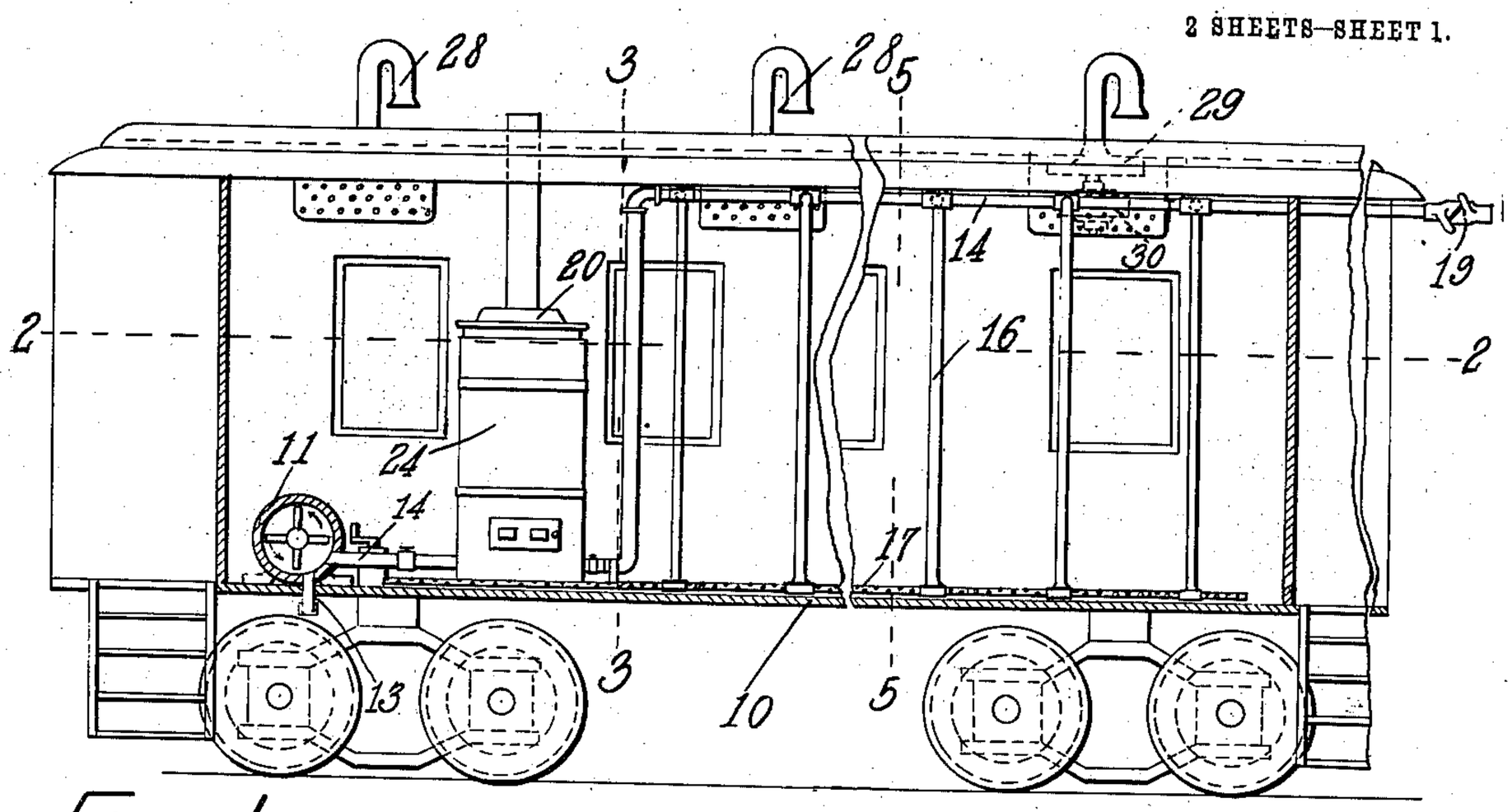

Fig. 1.

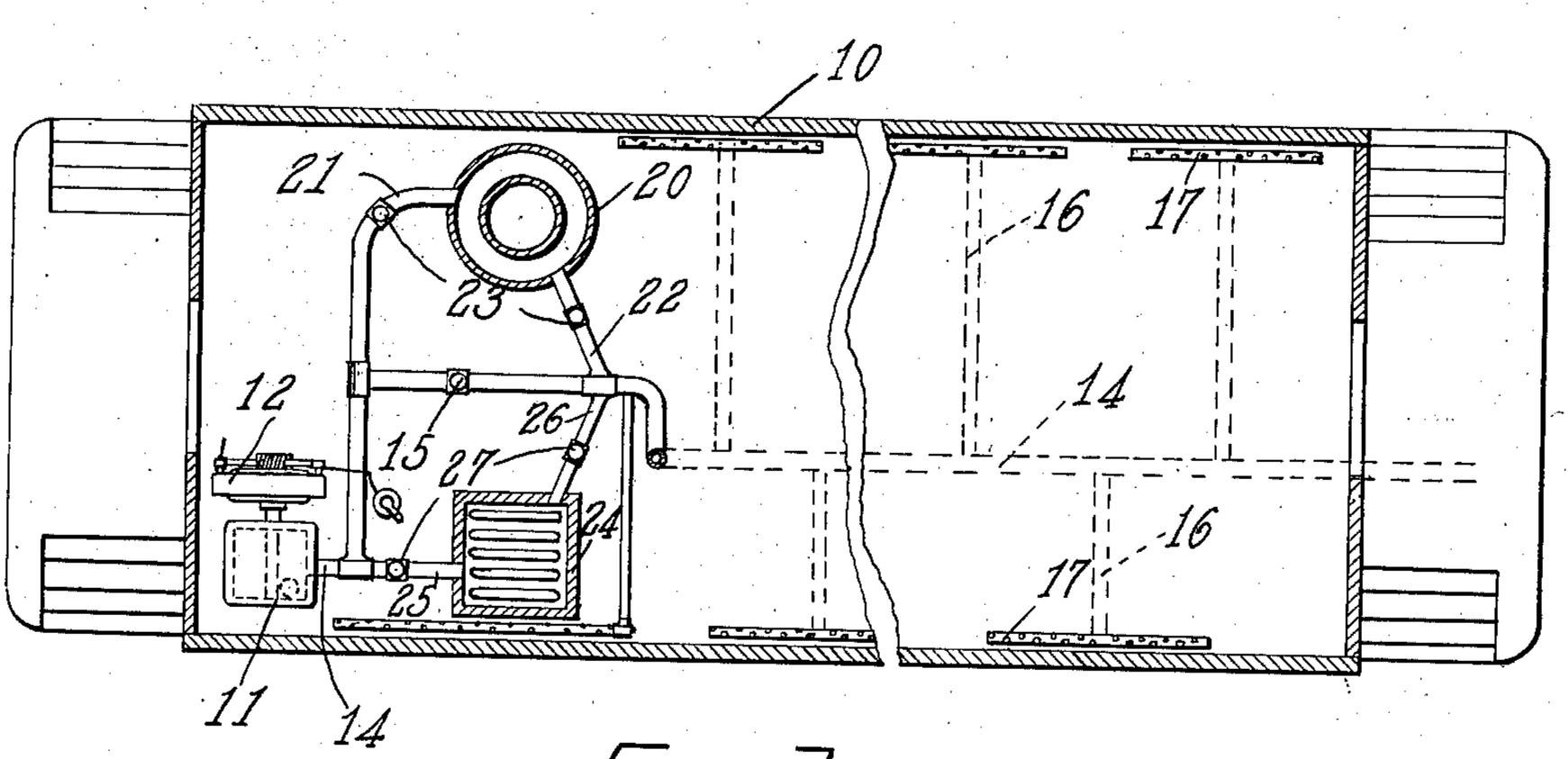

Fig. 2.

Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

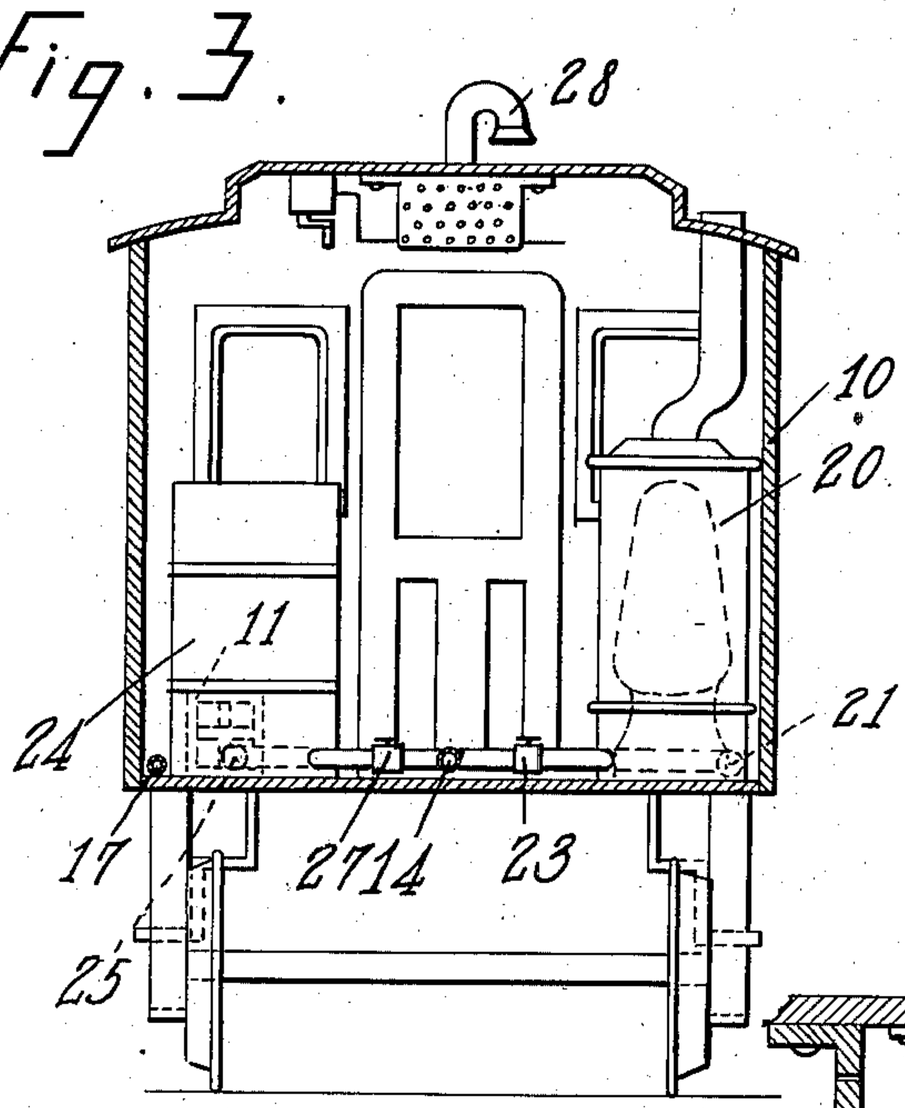


Fig. 4.

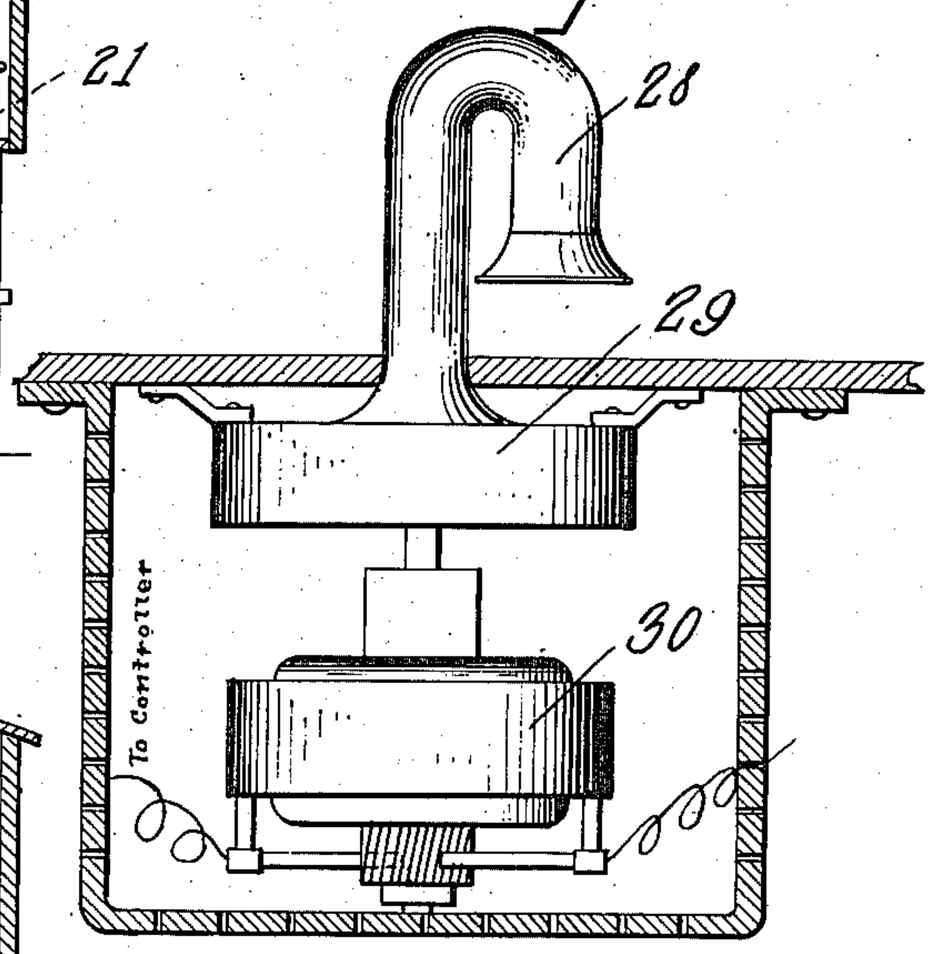


Fig. 5.

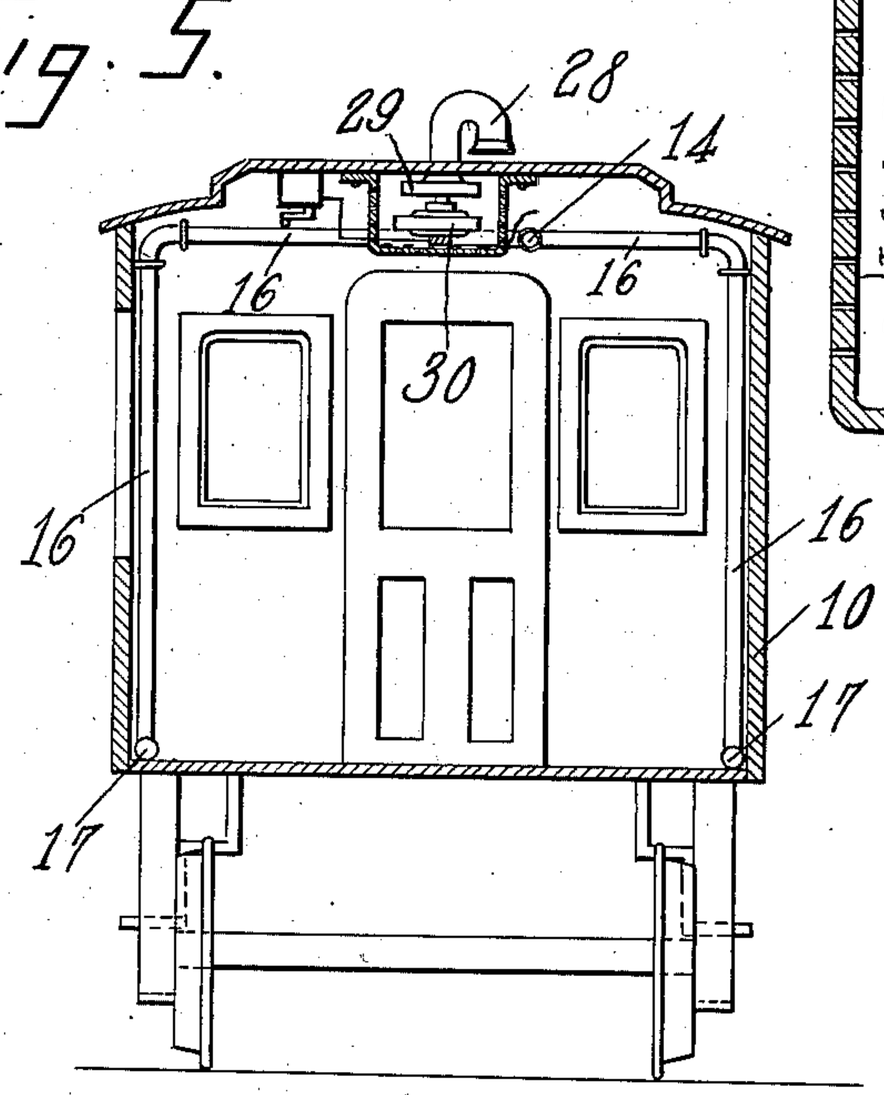
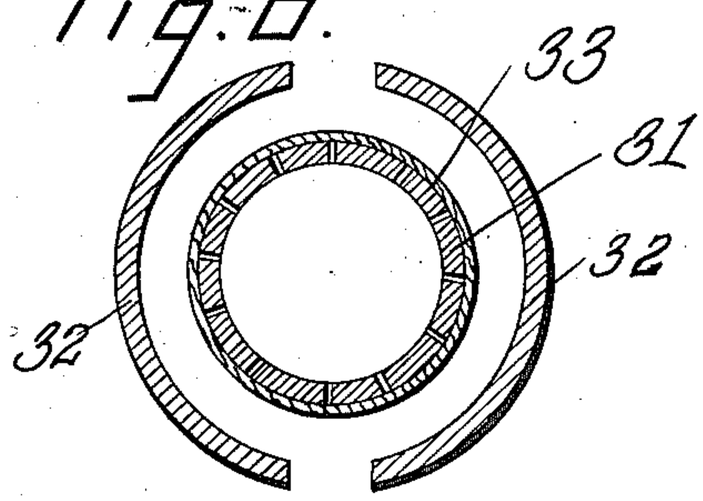


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

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VENTILATING SYSTEM.

976,229. Specification of Letters Patent. Patented Nov. 22, 1910.

Application filed April 23, 1909. Serial No. 491,764.

To all whom it may concern:

Be it known that I, JOHN C. STROH, a citizen of the United States, residing at Drifton, in the county of Luzerne, State of Pennsylvania, have invented certain new and useful Improvements in Ventilating Systems; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to ventilating systems and has special reference to ventilating systems for railway cars although the same may be used for ventilating houses and other places of like character.

One object of the invention is to improve systems of this character so that not only the same temperature may be maintained but also an equable pressure may be assured at all times, thus preventing the uncomfortable oppression of the plenum system.

Another object of the invention is to provide a ventilating system in which the supply of air will be of uniform temperature without regard to the season of the year or the outside conditions.

A third object of the invention is to provide an improved ventilating system wherein the foul air will be drawn off positively as fast as the fresh air is pumped into the system.

With the above and other objects in view the invention consists in general of a plenum fan arranged to pump air into an apartment, a heater, a cooler, and a series of vacuum fans each having its individual inlet and outlet, all being of a novel and improved arrangement.

The invention further consists in such novel features of construction and combination of parts hereinafter fully described, illustrated in the accompanying drawings, and specifically set forth in the claim.

In the accompanying drawings, like characters of reference indicate like parts in the several views, and:—Figure 1 is a side view of a car equipped in accordance with this invention, the side of the car being broken away to show the interior arrangement of piping and other parts. Fig. 2 is a longitudinal horizontal section on the line 2—2 of Fig. 1. Fig. 3 is a transverse section on the line 3—3 of Fig. 1. Fig. 4 is an enlarged detail view of one of the vacuum fans and its connected parts. Fig. 5 is a cross section on the line 5—5 of Fig. 1. Fig. 6 is a horizontal section through the end of the intake pipe.

The numeral 10 indicates a car body and in this body, preferably on the floor thereof, is held a plenum fan 11 operated by a suitable motor, reciprocal of which is here indicated an electric motor 12. From the fan 11 extends an intake pipe 13 which runs down through the bottom of the car or apartment and from this fan also extends a delivery pipe 14. This delivery pipe 14 is provided with a cut off valve 15 and from the pipe 14 at various points are led off branch pipes 16 terminating in outlet pipes 17. The delivery pipe 14 runs the entire length of the car and at the end opposite the valve 11 is provided with a valve 18 for the purpose of cutting off any other car. The delivery pipe 14 also extends beyond this valve and is provided on its outer end with a coupling 19 which enables one fan to supply a series of coupled cars, the other cars arranged similar to the first car but without the fan and other apparatus now to be described.

Adjacent the fan end of the delivery pipe 14 is a heater 20 located in a by-pass from the delivery pipe, the inlet of the heater being indicated by the numeral 21 and the outlet from the heater being indicated by the numeral 22. Valves 23 are provided in both the inlet and outlet pipes of this by-pass so that the passage of air through the heater may be properly regulated. Also adjacent the fan end of the delivery pipe 14 is a cooler 24. The cooler 24 is of any preferred construction and located in a by-pass of the pipe 14 being provided with an inlet pipe 25 communicating with the pipe 14 and an outlet pipe 26 also communicating with that pipe. Both the inlet and outlet pipe 25 and 26 are provided with valves 27 for the purpose of controlling the flow of cool air through the cooler 24.

The terminal pipes 17 are so arranged that they lie as close to the floor as possible and their outlet ends accordingly admit fresh air near the floor of the car.

Suitably positioned in the roof of the car are ventilators 28 arranged in series along the roof and each of these ventilators is pro-

vided with a vacuum fan 29 actuated by a suitable motor, here illustrated as an electric motor 30 direct connected to the fan.

The heater 20 may be of any desired type such as a steam or electric heated coil and the cooler may be ice cooled or cooled by means of a suitable ammonia compression machine carried on the engine or in any other way desired. These features are not deemed necessary here to be shown as the specific arrangement of the heater and cooler form no part of the invention.

In the operation of this device the temperature of the air is regulated by the proper adjustment of the valves 23 and 27 taken together with the valve 15. For instance, if the air in the car is too cool the valves 23 are opened and the valve 15 either wholly or partially closed so that the fresh air is driven through the heater. On the contrary if the air in the car is too warm the valve 15 is either partially or wholly closed and the valves 27 opened while the valves 23 are closed. In this manner the correct temperature of the air may be maintained at all times. Further the pressure of the air may be regulated by means of the proper speeding of the plenum and vacuum fans, that is to say, if the pressure becomes too low as when crossing high mountain passes and in other high altitudes, the vacuum fans are run slower than the plenum fans while when the pressure becomes too great as when crossing such places as lie below the surface of the sea, the vacuum fans are run faster than the plenum fans. In this manner the pressure is regulated to a nicety.

In order to prevent the introduction of dust and flying paper into the in-take pipe this in-take is provided with a metallic perforated guard 31 surrounding the in-take end of the pipe on both sides of this guard are dust shields 32. The perforated guard is further provided with a covering of haircloth 33 so that the air is thoroughly filtered before admission to the in-take pipe.

There has thus been provided a simple and efficient device of the kind described and for the purpose specified.

It is obvious that minor changes may be made in the form and construction of this invention without departing from the material principles thereof. It is not therefore desired to confine the invention to the exact form herein shown and described, but it is wished to include all such as come properly within the scope of the appended claim.

Having thus described my invention, what is claimed as new, is:—

In a device of the kind described, a railroad car, and means to ventilate said car, said means being also adapted to maintain an equable pressure within the car without reference to the barometric pressure outside of said car, said means comprising an inlet duct, a plenum fan connected to said duct to force air into the car, a motor actuating said plenum fan, speed controlling means for said motor, an outlet duct leading from said car, a vacuum fan connected to said outlet duct to force air out of the car, a motor actuating said vacuum fan, and speed controlling means for the last mentioned motor, the last mentioned motor and its speed controlling means being independent of the first mentioned motor and speed controlling means whereby the plenum and vacuum fans may be run at different rates of speed.

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

JOHN C. STROH.

Witnesses:

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