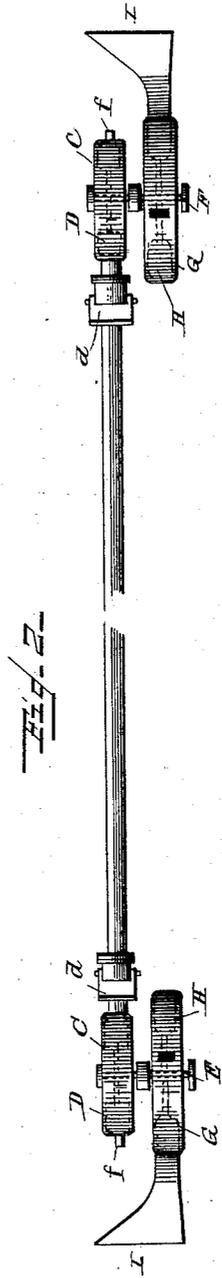
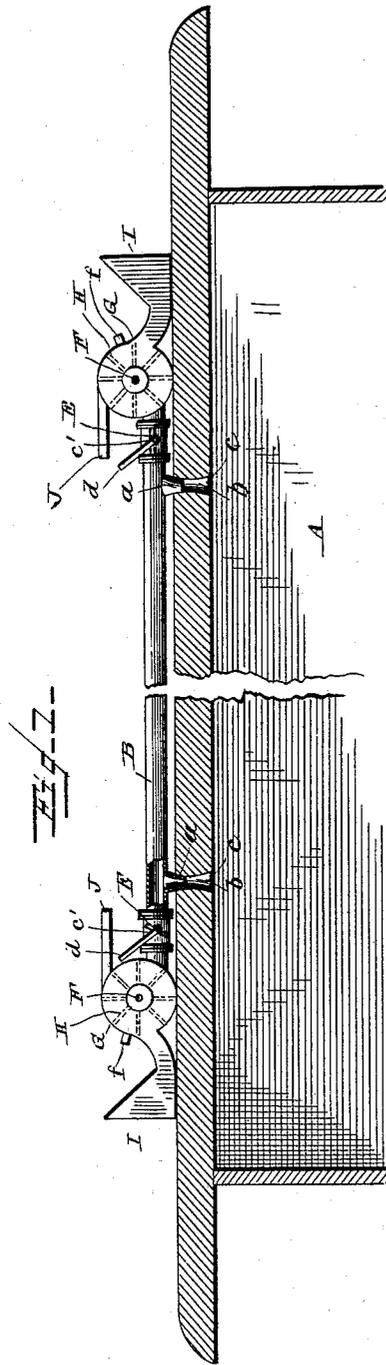


(No Model.)

F. S. TULL.  
CAR VENTILATOR.

No. 371,287.

Patented Oct. 11, 1887.



WITNESSES

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# UNITED STATES PATENT OFFICE.

FRANCIS SHALIS TULL, OF GALVESTON, TEXAS.

## CAR-VENTILATOR.

SPECIFICATION forming part of Letters Patent No. 371,287, dated October 11, 1887.

Application filed March 7, 1887. Serial No. 230,016. (No model.)

*To all whom it may concern:*

Be it known that I, FRANCIS SHALIS TULL, of Galveston, in the county of Galveston and State of Texas, have invented certain new and useful Improvements in Car-Ventilators; 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 pertains to make and use the same.

My invention relates to car-ventilators; and the object of the invention is to provide for the thorough exhaustion of the foul air within the car.

Cars as heretofore constructed have been provided with hinged or pivoted panels adapted to be opened when ventilation was desired; but owing to the speed of the train fresh air was forced into the car and the foul air forced down into and circulated through it, and the eduction of foul air in any great quantity prevented.

The invention consists in the features of construction and combinations of parts hereinafter described, and pointed out in the claim.

In the drawings, Figure 1 is a longitudinal vertical section of a portion of car with my improved ventilator applied thereto. Fig. 2 is a bottom view of the ventilator.

A represents the car, and B a pipe located on the roof, and preferably to one side of the center thereof, said pipe extending the entire length of the car and communicating with the interior thereof at suitable intervals by means of branch pipes *a*, which extend into openings *b* in the roof of the car, said openings being preferably covered at their inner ends by gratings *c* or their equivalents. At each end of the pipe B is provided a casing, C, substantially circular in form, and each having within it a rotary exhaust-fan, D.

E represents the valves or dampers of the device, located within the pipe B at each end thereof, between the casings C and the pipes *a*, said valves being designed to cut off communication between the casings and said pipes *a*. The valves or dampers are each mounted on a suitable shaft, *c'*, the ends of said shaft extending through and beyond the pipe A. Upon the ends of each of these shafts is mounted a bail, *d*, provided with a wing or vane, whereby the valves may be opened or closed by the force of the air, the open and

closed positions of the valve being shown by full and dotted lines, respectively.

It will be seen that when the valves occupy a horizontal position free communication between the interior of the car and the casings C is established, and that when said valves occupy a vertical position, as shown in dotted lines, communication between the interior of the car and the casings is closed.

The fans D are mounted upon suitable shafts, F, having bearing in the sides of the casing C, and extend beyond the same at one end and into casings G, located on a line with casings C, to one side thereof. The shafts F also have bearing in the sides of the casings G and carry force-fans H. Each of the casings G is provided with a flaring or funnel-shaped mouth, I, which extend from the casings in opposite directions, so that the air will be forced into one or the other of the casings G without regard to the direction of travel of the train.

Extending inwardly toward each other from the casings G are escape-pipes J.

The operation of my invention is as follows: When the train is in motion, the air is forced into one or the other of the casings G and rotates the fan therein, the air passing out through the escape-pipe of said casing. The revolution of the fan within the casing rotates the shaft F and the fan D thereon, so that a suction is created within the pipe B, and the foul air withdrawn from the car and discharged through one or more outlet-openings or pipes, *f*, in the fan-casing C. When the car has been sufficiently ventilated, the exhaustion of air therefrom may be stopped by closing the valve.

If desired, a pipe, B, can be placed on each side of the center of the roof of the car, or only one may be employed, as before described.

It will be apparent that the valve at the front end of the pipe (with reference to the direction of travel) will be opened by the force of the air against the wing or vane, and that the valve at the opposite end will be closed by the same force, so that the exhaust-pipe will be always closed at one end.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The combination, with a car, of an eduction-pipe arranged lengthwise of the car, a casing,

C, at the end of the pipe, a fan-wheel mounted upon a shaft, F, within said casing, a casing, G, arranged adjacent to the casing C, a fan-wheel arranged within said casing H upon an extension of the shaft F, and valves in the 5 eduction-pipe, to be opened and closed by the air, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

FRANCIS SHALIS TULL.

Witnesses:

JAS. W. HALE,  
RICHARD B. S. GRIM.