E. B. FORBUSH.

Ventilating, Heating, and Excluding Dust from Railroad Cars.

No. 27,212. Patented Feb. 21, 1860.

Fig: 1.

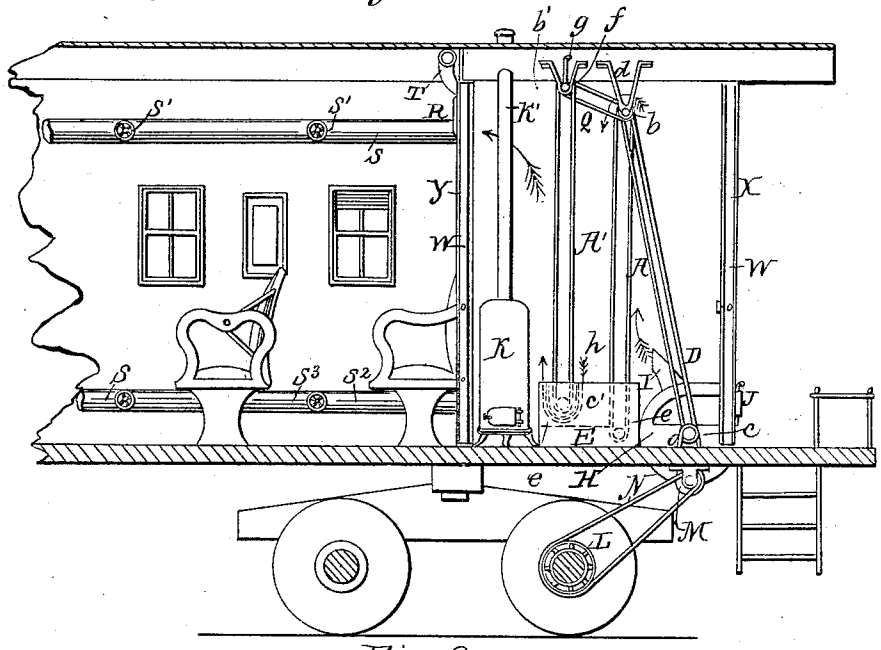
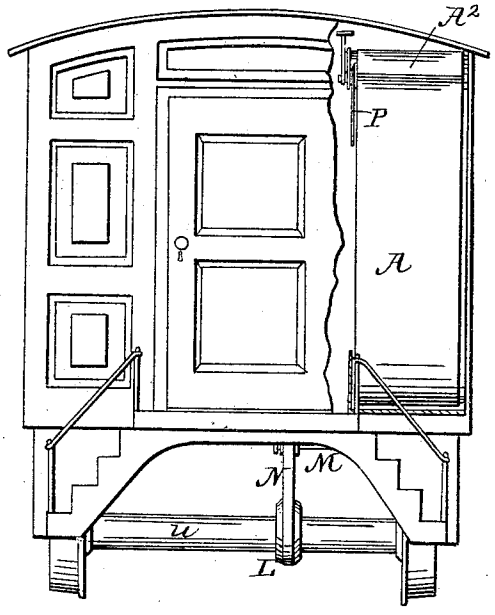


Fig: 2.



Witnesses.
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UNITED STATES PATENT OFFICE.

ELIAKIM B. FORBUSH, OF BUFFALO, NEW YORK.

APPARATUS FOR THE VENTILATION OF RAILROAD-CARS.

Specification of Letters Patent No. 27,212, dated February 21, 1860.

To all whom it may concern:

Be it known that I, ELIAKIM B. FORBUSH, of the city of Buffalo, county of Erie, and State of New York, have invented new and useful Improvements in the Mode of Ventilating, Heating, and Excluding Dust from Railroad-Cars; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and the letters of reference marked thereon, in which—

Figure 1 is a longitudinal section of a car, showing an elevation of my improvements, and the arrangement of the same within the car. Fig. 2 is an end elevation of the same.

To enable others skilled in the art to make and use my invention I will proceed to describe its construction and operation.

A separate room or compartment of about five feet in length and three feet in width (more or less) is made and placed in the middle, or at one corner of the car, which room is to contain the apparatus hereinafter described. If said room is placed in one corner of the car, the end and side walls of the car, may form the two corresponding walls of the said room—the upper ceiling or roof of the car forming the upper wall of said room, or if preferred, and which perhaps will be the most practicable the entire room may be a separate structure from the car.

The wall of this room next to the passenger seats is represented in the drawings at Y, and the opposite end wall at X. The inside wall next to the passage way, has two or more doors, which are represented at W, as being open, in order to show the arrangement of the several parts of the apparatus. When these doors are closed, they make a tight wall so that the air cannot escape from the room through them. They also fit closely to the edges of the endless aprons so that no air can pass between them and the aprons. The end of the stove is allowed to project through an inch or two into the passage way, so that it may be supplied with fuel, without opening the door into the room.

A represents a blanket or endless apron of cloth or net work, which is supported upon two rollers *b* and *c*. The upper roller (*b*) is hung in appropriate bearings, in two brackets which drop down from the upper ceiling of the car, (or compartment in which the apparatus is placed). One of the brackets is seen at *d*. A space of several inches intervenes, between this roller and the upper ceiling, to allow the air to pass over the apron. If netting should be used instead of cloth, then this roller would run close to the upper wall, in order to compel the air to pass through the net work. The lower roller (*c*) runs upon appropriate bearings, within the water tank E.

The blanket or endless apron A′, is hung upon rollers *b′* and *c′*. The upper roller (*b′*) is supported in appropriate bearings in two brackets, one of which brackets is seen at *f*. These brackets are connected to the upper ceiling, dropping down just far enough, to allow the apron to pass over the roller. The space (if any) between this roller and the ceiling should be entirely filled to prevent the air from passing over as represented by the strip *g*. As a modification this apron may also be made of netting or other open work material so that the air must pass through it, on its way into the car.

The water tank E, may be made about 18 inches wide, 14 inches high (more or less) and 3 feet in length. Its length, will of course equal the width of the room. This tank is to contain a sufficient quantity of water to saturate the apron A, as it revolves—*e*—*e*, represents the water line. A quantity of ice will be put into this tank in the summer season for the purpose of cooling the air. An extra water trough or box is placed within and connected to the main tank E, as represented by the dotted lines *h*. It reaches across the main tank, leaving a large space below it and the bottom of the tank, so that the air can pass under it, and over the water in the tank. The lower roller *c′*, runs in appropriate bearings in this trough. A sufficient quantity of water is put into this trough, to immerse the apron A′, as it revolves.

H, represents a "blower" made in any well known and convenient form and so placed as to take in air, in front and near the bottom of the car. It may be so constructed and placed, as to take in air below, or from the side of the car.

I, represents a spout or nozzle, which directs the air from the blower directly against the apron A.

J, represents a register in front of the car

for regulating the quantity of air admitted into the blower.

K, represents a stove or furnace and K′, stove chimney, which are placed in the space between the apron A′ and the wall Y.

L, shows a pulley on the axle of the forward truck wheels. This pulley should be placed at or near the center of the axle, so that in turning curves on the track the belt will not be materially affected thereby.

M, represents a shaft and pulley properly connected to the bottom of the car.

N shows a belt, running from the pulley on the axle of the truck wheels to a pulley on said shaft M. O, represents a belt running from a pulley on said shaft M to a pulley on the shaft of the fan or blower.

P, represents a belt or cord running from an appropriate pulley on the shaft of the blower to an appropriate pulley on the roller *b*. Q belt or cord from roller to roller.

R, shows a register in the wall Y, which is for the purpose of admitting the air from this separate apartment, directly into the car, without passing through the distributing pipes, whenever it may be desirable to do so.

S, represents a distributing air pipe which connects with the apparatus room, and passes along the side of the car, near the top, with registers *s′*, for each seat, so as to insure a perfect distribution of pure air to each passenger. S^2, represents a similar distributing air pipe placed along the wall of the car near the bottom thereof, with a similar arrangement of register S^3. Either one or both of these pipes may be used, at the same time, as may be desired.

The air may be shut out from either one or both of these pipes, by appropriate registers or valves for that purpose, in which case the air may be admitted directly into the body of the car by means of the register R.

T, represents a cross pipe, which leads over from the apparatus room, to a similar arrangement of pipes and registers on the opposite side of the car, so that the air may be distributed equally to the pasengers on both sides of the car. Passengers occupying a seat, may open and close the register in the pipe for that seat at pleasure. The conductor will have a general supervision over the whole apparatus, and will see that it is properly managed.

Power for propelling the fan blower and the endless aprons is derived from the axle *n*, of the truck wheels and transmitted through the series of belts and pulleys already described. By a proper adjustment of the several pulleys in respect to their relative size the required speed may be given to the blower, and to the revolving aprons. The requisite shifting pulleys may be used, so as to arrest the motion of the blower or aprons, at any time desired.

It may be found expedient to propel the endless aprons, independently of the blower, by means of weights, springs or clock work, as a small amount of power is required for this purpose and the motion of the aprons may be quite slow.

Many times, when the temperature of the atmosphere is quite cool, but not cold enough to require a fire it will not be necessary to use the blower. In such case a separate register in front of the car may be used to admit the air into the apartment without passing through the blower but under all circumstances the endless aprons or their equivalents will be required. When running against the wind the blower perhaps need not be used. The stove need not be removed from its place during the warm season. A similar apparatus may be placed in each end of the car if experience shall prove it to be necessary. Appropriate registers will be made in the upper wall or roof of the car, to provide for the escape of the foul and surplus air.

Operation: The air passing in through the front register or being forced in by the blower will strike against the revolving apron A, and the particles of dust, cinders and other floating matter contained in the air, will lodge against or adhere to the wet, revolving apron, and be carried down by the apron and washed off in the water tank, while the air in a measure relieved of its impurities will pass up and over the apron in the direction of the arrows. Any dust or particles of matter which failed to adhere to apron A, will be caught by apron A′, or becoming heavy by passing through the mist, which will naturally be raised by the revolving aprons will drop down upon the surface of the water in the water tank, and there be retained. So that the air will be thoroughly cleansed of its dust and impurities, by the time it gets into the space occupied by the stove, and thus pass into the car, in a pure and fresh state, and also at the same time, be either cooled by the ice and water in the water tank, or heated by the stove in its passage; as circumstances may require. Another series of revolving aprons can be added to the arrangement if deemed expedient. A cloth or sponge, saturated with odoriferous extracts and hung up in the room occupied by the stove will add very much to the salubrity and sweetness of the air as it passes into the car.

I do not claim broadly, the application and use of an endless apron of cloth or other fibrous or porous material through which air is forced to pass in order to cleanse it from dust, and other impurities. Neither do I claim broadly the use of wire gauze, perfo-

rated metal sheets, or sponge for such purpose. Neither do I claim broadly the use of distributing air pipes within the car; but I do claim

1. The arrangement of the revolving aprons A, A′, water and ice tank E, and stove K, (or other heating apparatus) in a separate apartment or room within the car, relatively to the blower H, for the purposes herein described.

2. I claim the described arrangement of the distributing air pipes S, S′, and T, when arranged relatively to the described apparatus for purifying the air from dust, as herein set forth.

ELIAKIM B. FORBUSH.

Witnesses:

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EDW. F. BROWN,
OCTAVIUS KNIGHT.