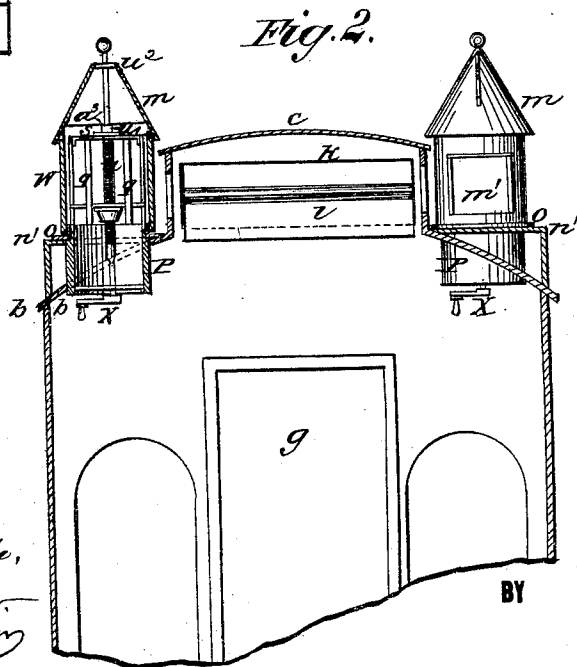
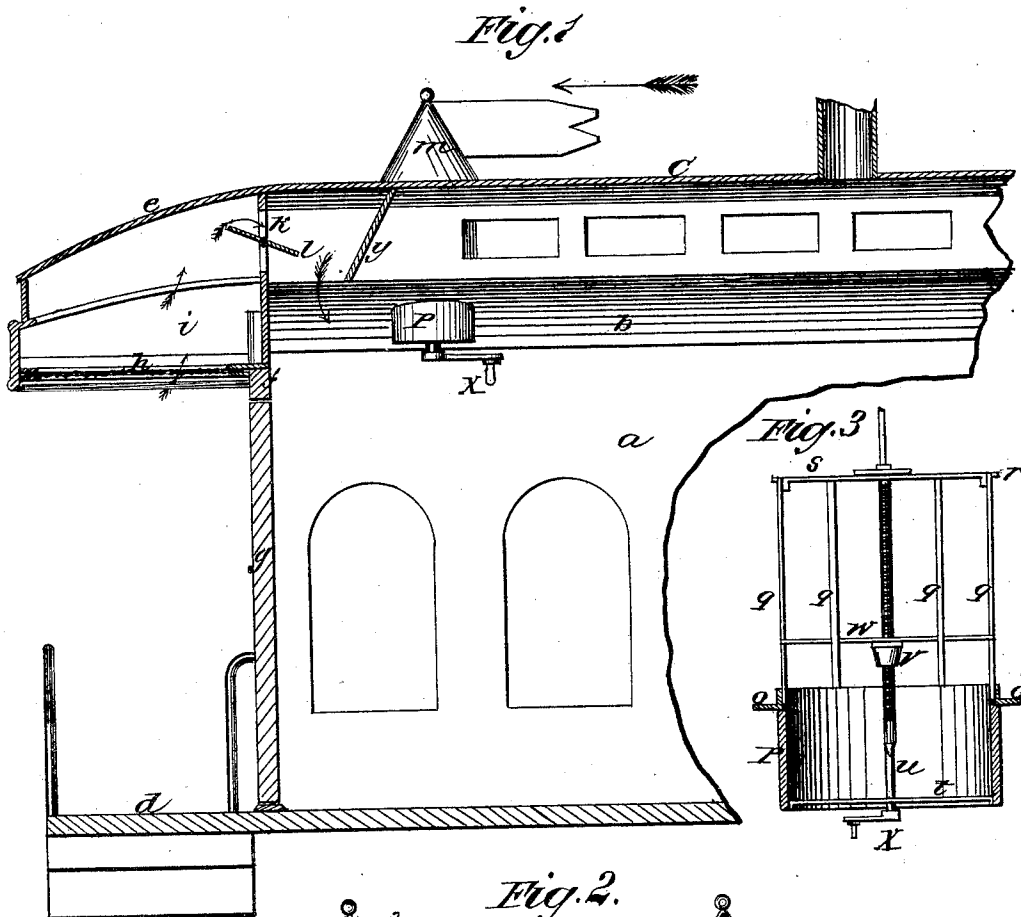


E. C. IBBOTSON.
VENTILATING-CAR.

No. 175,990.

Patented April 11, 1876.



WITNESSES:

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EDWARD C. IBBOTSON, OF CHELSEA, MASSACHUSETTS.

IMPROVEMENT IN VENTILATING CARS.

Specification forming part of Letters Patent No. **175,990**, dated April 11, 1876; application filed February 28, 1876.

To all whom it may concern:

Be it known that I, EDWARD C. IBBOTSON, of Chelsea, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Ventilating Railroad Passenger-Cars, of which the following is a specification:

This invention has reference to improvements on railroad passenger-cars, to provide the same with a more suitable current of air for ventilating than by any of those means at present in use.

In ventilating all spaces, no matter for what purpose they are, whether it be a room, car, building, &c., two things are in all cases needed—i. e., a good inlet, and an equally good outlet, by which the air can circulate. Should either of these be deficient, the excellence of the other, no matter how great, will be confined in a great measure to the capacity of the poorer of the two. My invention therefore particularly consists in the combination of the inlet and the outlet, hereinafter described.

In the drawing hereunto annexed similar letters of reference indicate corresponding parts, and Figure 1 is a sectional elevation of a car with my invention; Fig. 2, a transverse section of Fig. 1. Fig. 3 is a detail of Fig. 2.

Letter *a* is the body of the car; *b*, the lower roof; and *c* the elevated roof. *d* are the platforms at the end of the car, and *e* the extensions of roof over platforms. *f* are the ends of the car, and *g* the doors. These are all constructed and arranged as at present in use. In the lower portion of the extension *e* of the roof *c* I place diaphragms of wire or other fine gauze or sieve work, as indicated by the dotted lines *h*, extending from one side of the car to the other, or a less amount, if desired, in which case the sides of the space not covered by sieve-work will be partitioned off, so that all the air coming into the spaces *i* will have to pass through the gauzes *h*. In the ends of the car *f*, above the door, I form a sufficient opening, *k*, for the air passing through the gauze *h* to enter the car. These openings I prefer to make rectangular, and I provide them with doors *l*, pivoted on their center, so that by rotating them on their piv-

ots the openings *k* can be closed or not, as desired. These doors will be provided with the ordinary means for securing them in any desired position, so that from being shut they may be set to regulate or cause an opening of any extent up to being fully opened. This is at present partially in use. *m* are cowls, situated on the roof *b*, beside the elevated roof *c*, one at each corner of the car, being provided of sufficient capacity to allow the desired amount of air to pass, arranged to act in turning their openings from the wind in the ordinary manner.

In Fig. 2 the cowl is shown set into the roof *b*, through a flat seat, *n'*, making up for the difference of the circular form of the roof, the flange *o* of the cowl resting fairly on the seat *n'*. The construction of this cowl is more clearly shown in Fig. 2. To the top of the cylinder *p* are attached the flange-ring *o* and uprights *q*, united at the top by a ring, *r*. *s* and *t* are diametrical stays, placed as shown in the drawings, for carrying the spindle *u*. The upper part of this serves as a pivot for the cowl, while the body is screwed, as delineated.

It will be seen by Fig. 2 that the roof of the cowl has two bearings, one at *u²* and one at *u³*, the cross-strap inside of cowl resting upon washer *u¹*, which keeps the cowl steady and clear of the uprights *q*. Upon the screwed part of spindle *u* is placed a nut, *v*, having a disk, *w*, of suitable size to cover the opening at the top of the cylinder *p* attached to it. This disk is also provided with notches to let in the uprights *q*, which serve as further guides or steadiments for it. *x* is a small crank and handle for revolving the spindle *u*. In doing this the disk *w* may be raised to give the full area for passage of air through the cylinder *p*, or it may be lowered to entirely obstruct it. It will be seen that it is unnecessary to place the diametrical stays below the flange-ring *o*, and that the cylinder *p*, as here given, is not necessary, and the crank *x* would then be placed at flange-ring *o*. *y* are diaphragms, situated as shown in Fig. 1, extending from the elevated roof down to about the level shown. These diaphragms may consist of curtains to draw on side or end rods, or any other similar device may be used. The

means by which these diaphragms may be made removable are so various and so common that it is useless further to explain them.

The operation of the invention is as follows: We will suppose the car to be moving in the direction indicated by the arrows above Fig. 1; therefore the left hand of the figure will be the front of the car. Whenever ventilation is desired I open the door *k* at the front of the car, I close the cowls *m* at the front of the car by lowering the disks *w*, and open the cowls at the rear of the car. In this manner the inlet is at *h*, at the front of the car, and the outlet is at *m'*, in the rear of the car. By the diaphragms *y* the current of air is thrown downward, as indicated by the arrows, within the car, causing a complete and gentle current of air throughout. The air entering through the gauze *h* is, by the large flat surface of the end of the car, assisted by the velocity of the car, or, in other words, a pressure is created to cause it to enter. Again, by the openings of the cowls being turned the reverse way to the wind a great tension or suction is created to draw out the air, and this is considered a very important feature of the whole invention, and which

renders the inlet system of more effect. By reducing or removing the diaphragms *y*, the current of air will follow more closely to the roof, the diaphragms *h* excluding the particles of dust. In case of dust, rain, or snowstorms, and the car coming to a stand, as at a depot or other stopping-place, the cowls will at once turn round to bring their openings to the opposite side to which the wind strikes them, and thus exclude the dust, rain, or snow, which would not be the case if they were fixed as in the ordinary ventilators used on cars.

I do not claim the inlet, consisting of diaphragm *h*, opening *k*, and pivoted door *l*.

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

The inlet, consisting of diaphragm *h*, opening *k*, with or without diaphragms *y*, in combination with outlet consisting of cowls *m*, all constructed, arranged, and operated substantially as described.

EDWARD C. IBBOTSON.

Witnesses:

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