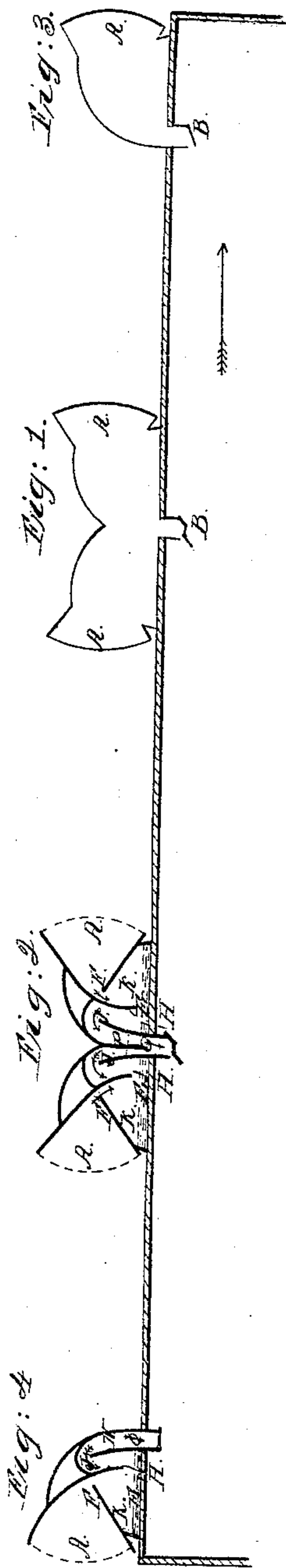


No. 10,216.

PATENTED NOV. 8, 1853.

G. SPENCER.
VENTILATING RAILROAD CARS.



UNITED STATES PATENT OFFICE.

GEO. SPENCER, OF UTICA, NEW YORK.

RAILROAD-CAR VENTILATOR.

Specification of Letters Patent No. 10,216, dated November 8, 1853.

To all whom it may concern:

Be it known that I, GEORGE SPENCER, of the city of Utica, county of Oneida, and State of New York, have invented a new and
5 Improved Machine or Apparatus for Ventilating Railway-Cars; and I hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the
10 annexed drawings, making part of this specification, in which like letters refer to like parts in all the drawings.

Figures 1 and 2 are representations of double machines each having two fronts adapted to the movement of the cars in each direction; Fig. 1 showing an exterior elevation, and Fig. 2 a vertical section. Figs. 3 and 4 represent single machines standing in a position to receive the air as the car moves
20 in different directions, Fig. 3 showing an exterior elevation, and Fig. 4 a vertical section.

The design of this invention is to furnish a convenient and portable apparatus upon the side of the top of the cars and to operate independently of the smoke-pipe, for
25 cleaning the air, on its admission into the car, and depending, for the power by which the air is forced into the car, upon the current occasioned by the movement of the car through the air.

To enable others to make and use my invention, I will proceed to describe its construction and operation.

The apparatus is made of tin or other
35 sheet metal. It is about 18 inches in height, measuring from the deck of the car, and about 20 inches in width, *i. e.* measuring across the car. The double machines (Figs. 1 and 2) are about 36 inches in length, *i. e.*
40 measuring lengthwise of the car, as seen in the drawing, and the single ones about half that length.

A represents the openings or mouths for the reception of the air, which enters those
45 opening to the right when the car is moving in that direction and those opening to the left when the car is moving in that direction.

The internal construction and arrangement are shown by the partitions seen in Figs. 2 and 4, which extend the entire width of the machine (about 20 inches). The opening at
50 A is large, being about 16 inches in width, vertically, by about 26 inches in length, horizontally. From the opening A, there is a
55 "gathering" or gradually contracting pas-

sage to the narrow "throat" F, which is about 2 inches in width, vertically, and extends the entire width of the machine (about 20 inches).

E is a stratum of water about one inch in
60 depth, in the bottom of the machine. The barrier N is erected to prevent the water from being dashed over into the car through the conductor O. The passages H and I are about 3 inches in width, vertically, extend-
65 ing the entire width of the machine. The partition P is inserted in the double machines (Figs. 1 and 2) to prevent the current of air from passing directly across and out
70 of the opposite side of the machine, and it extends nearly down to the bottom of the machine, making the conductor in those machines about one inch and a half in width
75 on each side of P. In the single machines, the conductor is about 3 inches in width. That part of the conductor that passes through the roof of the car is made separate from the machine and extends above and below the deck sufficiently to make the top and
80 bottom horizontal, allowing for the curve of the deck outside and inside. It is kept in its place by means of a flange on the outside, which is nailed to the deck to prevent the rain from passing down the outside of the
85 conductor into the car.

B is a hinged valve the purpose of which is hereinafter explained.

As the car is driven through the air, the volume of air entering the wide opening A, is gradually condensed until it reaches the
90 narrow "throat" F, which point it passes with great rapidity; but when it enters the large air-chamber K, its current is retarded, and the dust and cinders held in suspension are precipitated upon the surface of the
95 water E, by which they are moistened and prevented from being carried forward by succeeding currents. The air thus purified passes through the spaces H and I down the conductor O into the car, as indicated by
100 the arrows. But to prevent the air from falling directly upon the heads of the passengers the valve B are attached, by hinges, to the bottom of the conductor O, by which the air is deflected and dispersed through
105 the car, falling only upon the front of the person. As the single machines have one valve and the double ones two, the valves upon all the machines in operation may be
110 so arranged as to send a continuous gentle

current from the front to the rear of the car. They may also be entirely closed or dropped to any angle, as the case may require.

5 I am aware that a cistern of water in combination with an arrangement of flues and an enlarged air-chamber has been applied at the bottom of the smoke-pipe of locomotives to facilitate the arresting of sparks and cinders; but the vertical height to which a
10 machine may be raised upon the sides of the deck of a car without coming in collision with tunnels and bridges is so small that anything having the effect of flues, placed vertically or nearly so, cannot be used. I
15 have moreover ascertained by actual experiments that flues are not necessary in ventilators constructed as mine are, and I do not employ for that purpose anything of the nature or effect of flues. I am also aware
20 that machines containing a cistern of water, and to be placed upon the deck of the car, have been constructed for the purpose of forcing air into the car by the current produced by the movement of the car, in which
25 it was attempted to arrest the dust and cinders by sending them forcibly into the water through small pipes extended downward almost to the surface of the water or through narrow passages causing the air to zigzag
30 over the surface without the aid of enlarged air-chambers. But such machines have

failed to arrest entirely the dust and cinders except where the space between the bottom of the pipes or barriers and the surface of the water was so small as to prevent the
35 passage of a volume of air sufficient for summer ventilation. I am also aware that a "throat" and "gathering" like mine have been long used. I therefore do not claim the use of a "throat" and gathering separately, nor of a surface of water separately,
40 nor of an enlarged air-chamber or a series of them separately, nor the combination of any two of them; but,

What I claim as my invention and desire
45 to secure by Letters Patent is—

The application of a single "throat" being the termination of a "gathering" or gradually contracted opening in combination and immediate connection with a single
50 enlarged air-chamber directly above a surface of water, for the purpose of freeing the air forced into the car, from dust and cinders, thus enabling the dust and cinders to
55 fall upon the water, by their own gravity alone, substantially as described in the foregoing specification.

GEORGE SPENCER.

Witnesses:

WM. BAKER,
ISAAC N. COMSTOCK.