

(No Model.)

C. KNAPP.
APPARATUS FOR VENTILATING CARS.

No. 502,928.

Patented Aug. 8, 1893.

Fig. 1.

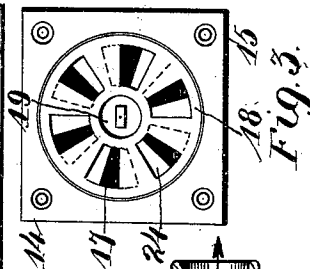
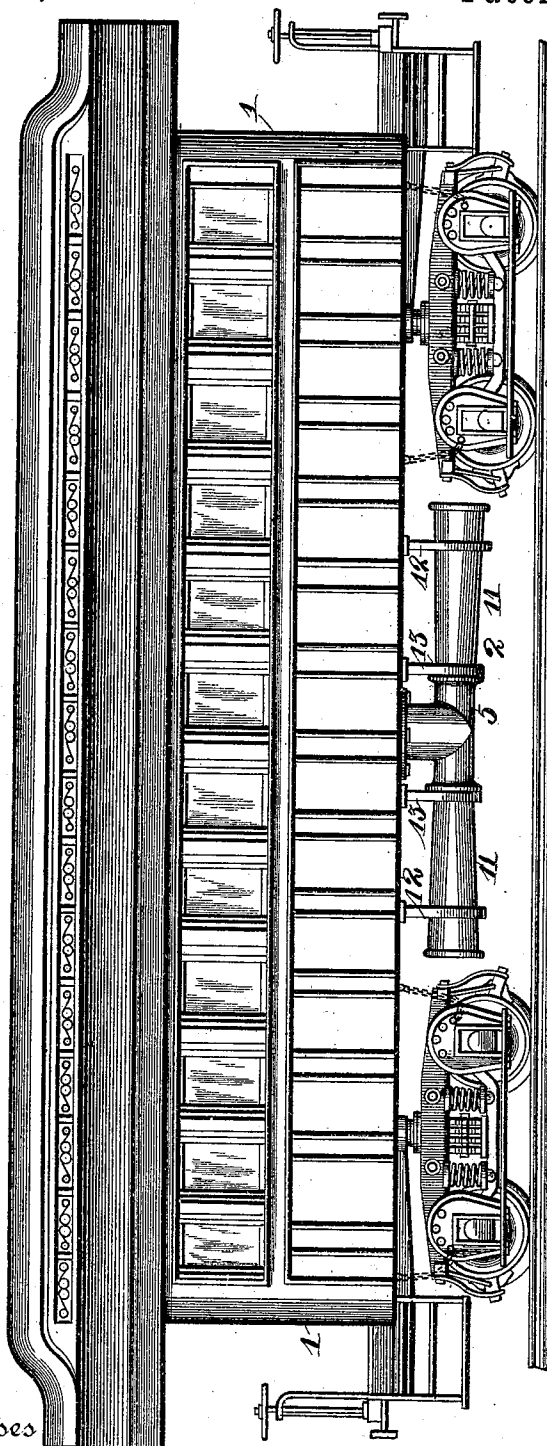


Fig. 3.

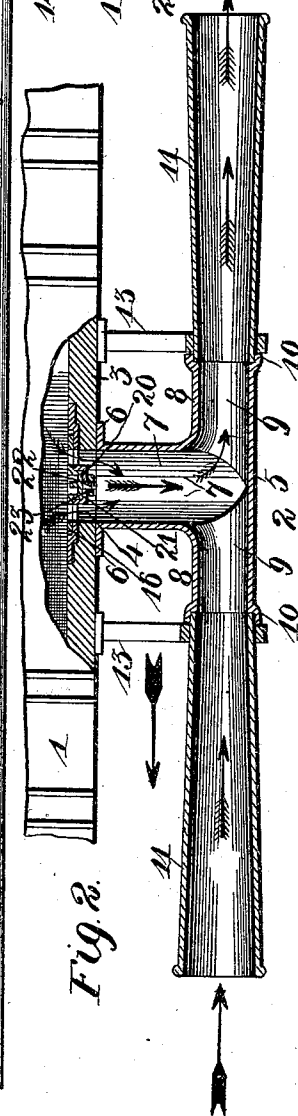


Fig. 2.

Witnesses

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APPARATUS FOR VENTILATING CARS.

SPECIFICATION forming part of Letters Patent No. 502,928, dated August 8, 1893.

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To all whom it may concern:

Be it known that I, CHARLES KNAPP, of the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Apparatus for Ventilating Cars, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to a new apparatus for ventilating cars and consists in the novel arrangement and combination of parts more particularly described in the specification and set out in the claims.

In the drawings Figure 1 is a side elevation of a car embodying my invention. Fig. 2 is a vertical longitudinal section of the ventilator showing the same as applied to a car, and Fig. 3 is a top plan view of the valve which I employ in carrying out my invention.

The object of my invention is to ventilate cars by circulating through the same fresh air admitted above the floor of the car and driving the foul air before it out into the atmosphere through the floor of the car, by suction resulting from the motion of the car in its travel; and to properly and thoroughly insure the working of my system, I employ a ventilator constructed in such a manner that the same may be readily attached to the bottom of the car and in communication with the interior of the same whereby when the car is running the foul or impure air is automatically drawn out of the car by suction and the same thoroughly ventilated.

It also consists in a valve located in the floor of the car and directly over the ventilator for regulating the desired amount of suction necessary to accomplish the desired result; and it consists in other details herein-after to be referred to.

The ventilator I employ is T-shaped and made either in sections or single piece as found most convenient, the vertical portion of which is attached to the floor of the car and below the opening formed therein. The horizontal portion of the ventilator has an uninterrupted passage through which the outside air passes at an approximate speed to which the car is running but in opposite direction to the motion of the car, thereby causing a suction in the vertical portion of the ventilator.

Referring to the drawings, 1 represents a car of the ordinary construction, and 2 the ventilator attached to the bottom of the same the construction of which I shall hereinafter describe.

3 represents the floor of the car which is provided preferably with a circular opening 4 and which is located ordinarily in the middle of the floor of the car. The ventilator proper is composed of three sections, the coupling 5 of which is T-shaped in longitudinal section. The vertical portion of the said coupling terminates in a flange 6 which provides means for attaching the said medium section to the bottom of the car immediately below the opening 4 formed in the same. In this instance the vertical passage 7 of the said section is in direct communication with the interior of the car through the opening 4. The horizontal portions 8 of said section form a common passage 9 which is in communication with the vertical passage 7 of the said section. The outer ends of the horizontal portions of the section 5 are provided with grooved flanges 10 which are adapted to receive the ends of suitable pipes 11 the construction of which I shall now describe. I employ two pipes 11 which are similarly constructed and of suitable length, generally about one-third the length of the car, including of course the intermediate section 5. The said pipes 11 are gradually flaring, the smaller ends of which are fixed within the ends of the horizontal portions 8 of the coupling in the manner shown in Fig. 2. The opposite ends of the flaring pipes are supported by hangers 12 depending from the bottom of the car. In order to further support the ventilator I employ additional hangers 13 which support the opposite ends of the pipes 11 adjacent to the coupling 5.

14 represents a rotating valve the construction of which has been found most desirable for the purpose. The said valve is composed of a stationary plate 15 which is fixed to the floor of the car immediately over the opening 4 formed therein, and is set into the floor in order to present a smooth and uninterrupted surface. The said plate 15 is provided with a circular depression 16 and formed in the bottom of the said depression are a series of radially arranged openings 17 which are in

communication with the passage 7 of the ventilator.

18 represents a circular plate which forms the movable part of the valve and is of such a size as to fit loosely in the circular depression 16 formed in the stationary plate 15.

19 represents a circular depression which is formed in the center of the circular plate 18 providing a rounded projection 20 projecting from the bottom of the said plate and is adapted to be received by a correspondingly shaped depression 21 formed in the stationary plate 15. The stationary and movable plates of the valve are united by means of a screw-threaded stud 22 and nut 23 in the manner shown in Fig. 2.

24 represent radially arranged openings formed in the circular plate 18 which are designed to register with the correspondingly shaped openings 17 formed in the stationary plate 15 whereby the proper amount of suction is regulated.

It is a well known law in the flow of fluids that their velocity increases as the passage through which they are made to flow decreases. For this reason the gradually flaring pipes 11 is an important feature, since by this construction the velocity of the air passing through the passage 9 is slightly and gradually increased over that which enters the conical pipes 11 at either end, and this increased velocity creates the proper suction at the bottom of the car drawing with it the foul and impure air which may have accumulated therein. Again this increase in the velocity within the passage 9 prevents eddying and back draft into the car. It will be understood of course that as the car moves in one direction, as for example in the direction indicated by the large arrow pointing to the left of the sheet in Fig. 2, the air will be drawn in the opposite direction through the pipes 11 as shown by the arrows in the same figure.

I do not limit myself to merely one coupling or ventilator but may have a series of two or more suitably connected by pipes and the terminal ones ending in conical pipes 11 as already described.

By inspecting the drawings it will be seen that the gradually flaring pipes forming a part of the ventilator constitute the greater portion of the length of the same, which construction

has been found advantageous, and the result of which has been previously described.

Having fully described my invention, what I claim is—

1. A car ventilator, serving as an eductor, consisting of a T shaped coupling, the vertical arm of which enters the car, and the opposite horizontal members of which are flanged, of two long gradually flared pipes, the smaller ends of the said pipes resting within the opposite flanged ends of the horizontal members of the said coupling, and projecting therefrom longitudinally of the car, to approximately a great distance therefrom, whereby the current of air passing through the pipes will educt the air from the car, hangers supporting the ends of the said pipes and secured to the car and a graduating damper at the projecting end of the vertical member of the coupling adapted to regulate the proper amount of suction, substantially as described.

2. A car ventilator, serving as an eductor, consisting of a T shaped coupling, the vertical arm 7 of which enters the car, and the opposite horizontal members 9 of which are flanged, of two long gradually flared pipes 11, the smaller ends of the said pipes resting within the opposite flanged ends of the horizontal members of the said coupling, and projecting therefrom longitudinally of the car, to approximately a great distance therefrom, whereby the current of air passing through the pipes will educt the air from the car, hangers supporting the ends of the said pipes and secured to the car, a valve composed of a plate 15 secured in the floor of the said car above the said vertical member, and having a circular depression therein provided with a central depression 21, and radially arranged openings, a circular plate contained in the said circular depression, having a central projecting part 19 contained in the central depression 21, and being radially slotted, and a bolt 22 passing through the center of the central depression 21 and secured to the projecting part 19 of the circular plate, substantially as described.

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

CHARLES KNAPP.

Witnesses:

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