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F. U. ADAMS.

VENTILATING APPARATUS FOR RAILWAY CARS IN TRAINS.

No. 489,908. Patented Jan. 17, 1893.

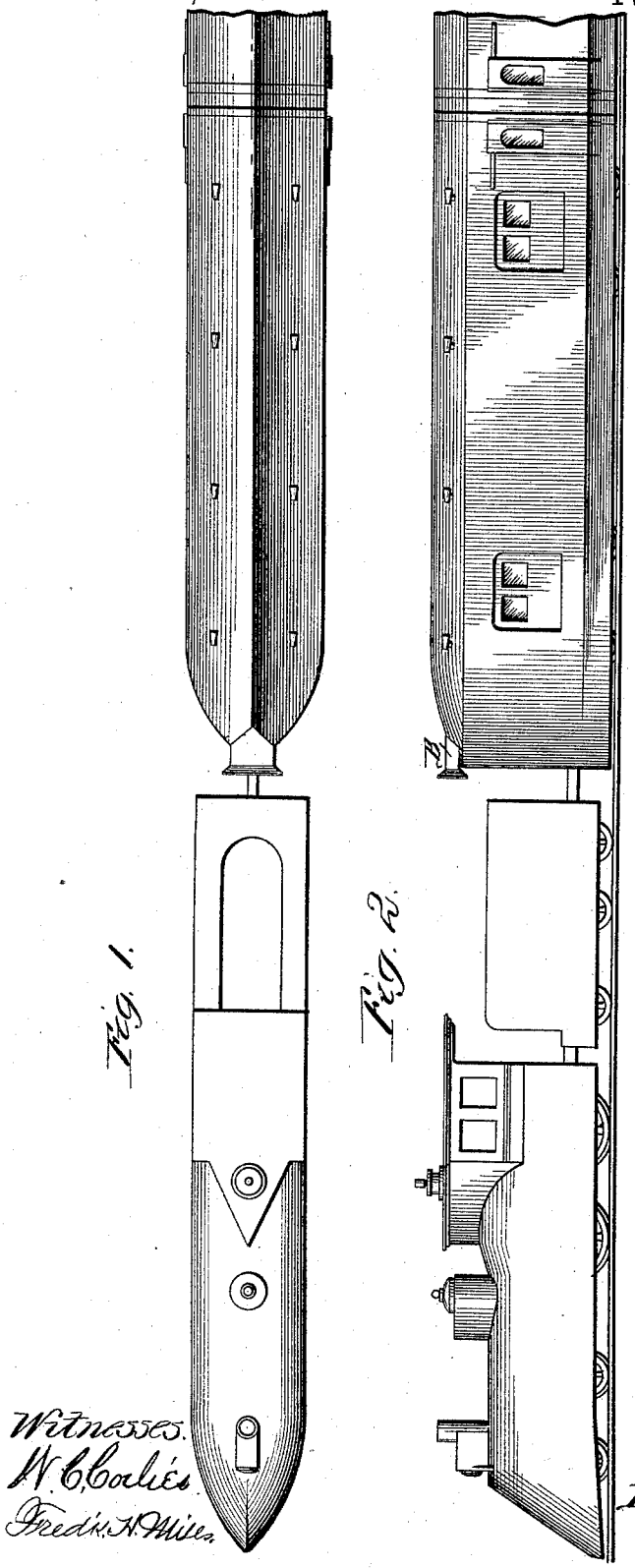

Fig. 1.

Fig. 2.

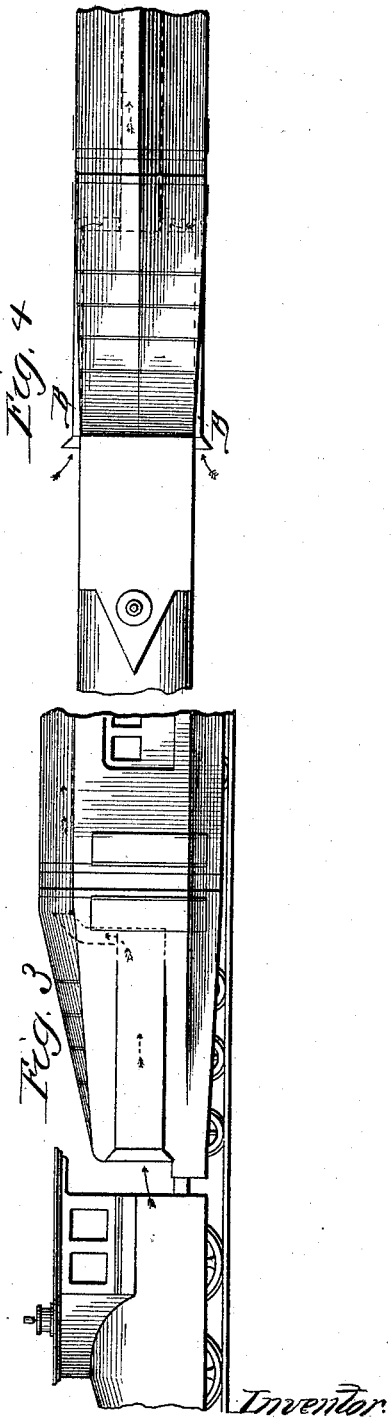

Fig. 4.

Fig. 3.

Witnesses.
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(No Model.)

8 Sheets—Sheet 2.

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VENTILATING APPARATUS FOR RAILWAY CARS IN TRAINS.

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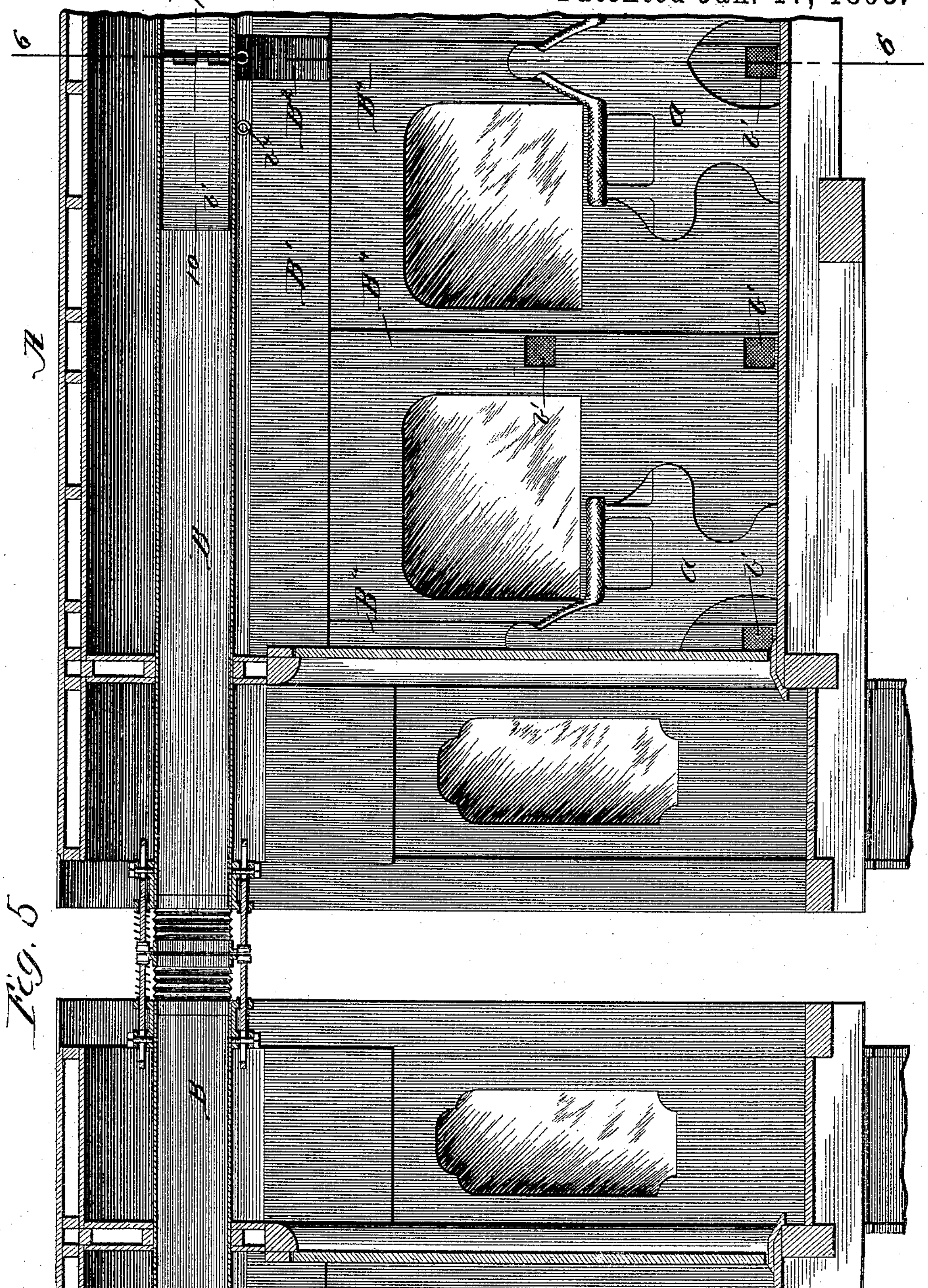
Fig. 5



Witnesses.
W. C. Corlies
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(No Model.) 8 Sheets—Sheet 3.

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VENTILATING APPARATUS FOR RAILWAY CARS IN TRAINS.

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Fig. 6.

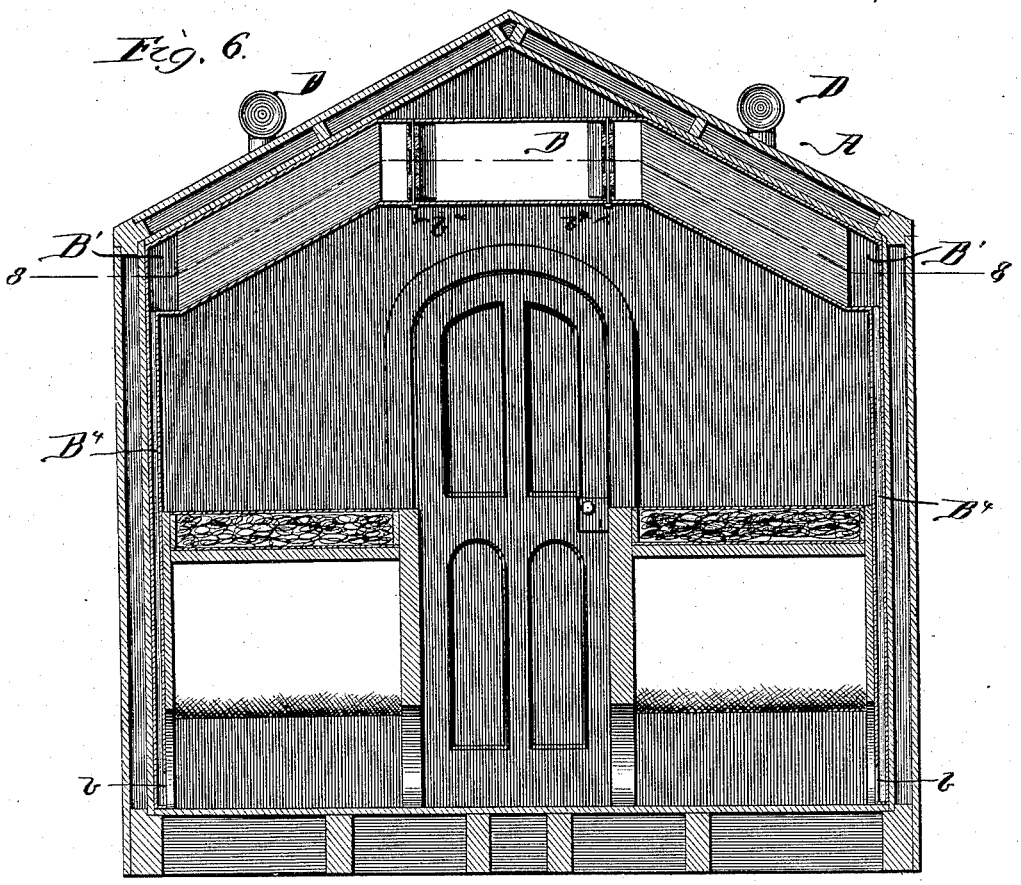
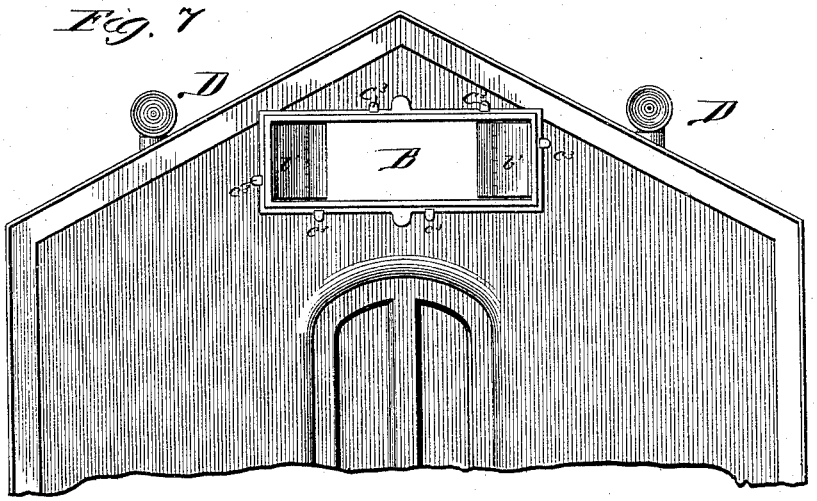


Fig. 7



Witnesses.
W. C. Corlies
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VENTILATING APPARATUS FOR RAILWAY CARS IN TRAINS.

No. 489,908. Patented Jan. 17, 1893.

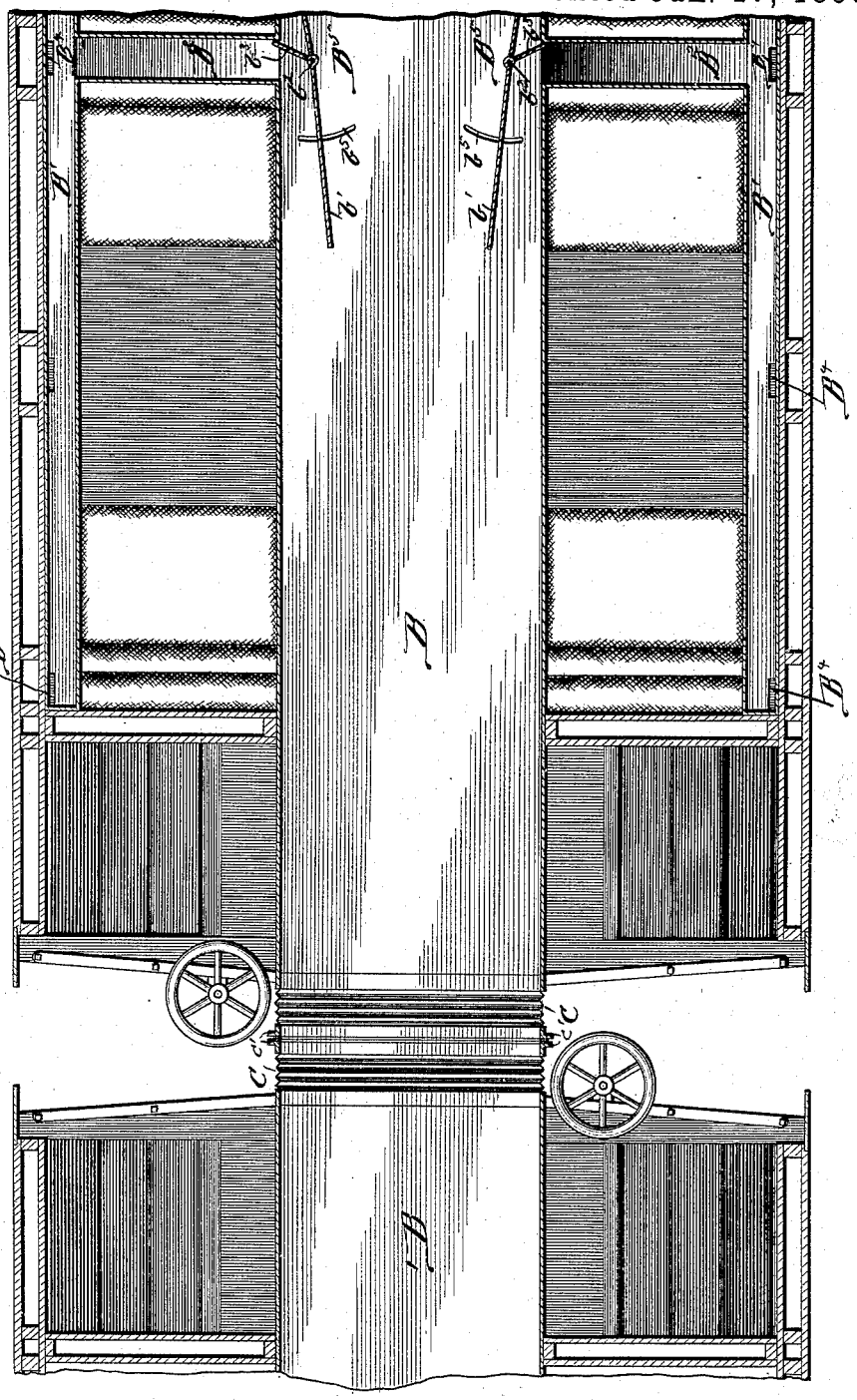

Fig. 8

Witnesses.
W. C. Coles
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(No Model.) 8 Sheets—Sheet 5.

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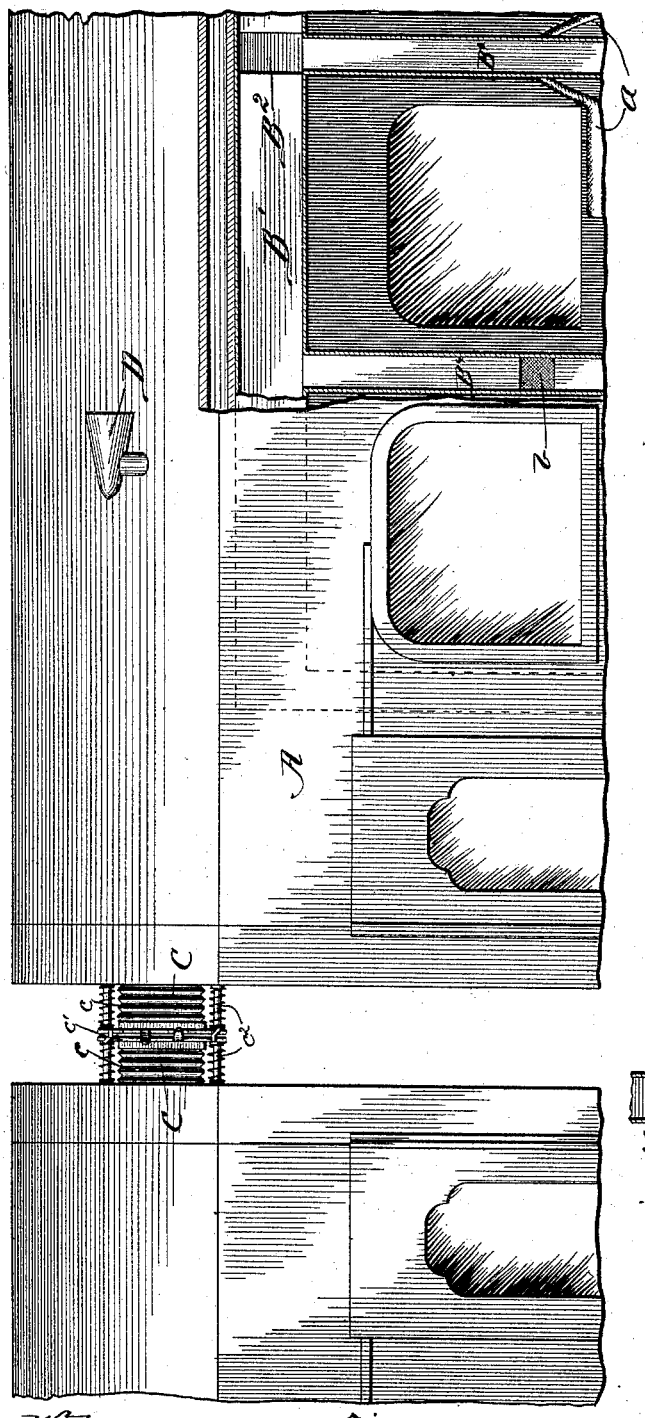

Fig. 9.

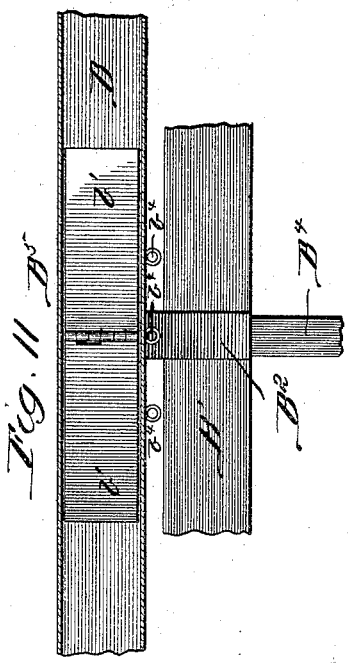

Fig. 11

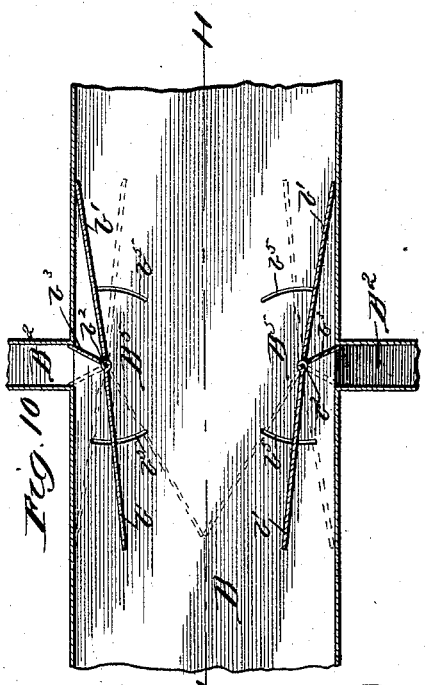

Fig. 10

Witnesses.
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(No Model.) 8 Sheets—Sheet 6.

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VENTILATING APPARATUS FOR RAILWAY CARS IN TRAINS.

No. 489,908. Patented Jan. 17, 1893.

Fig. 13.

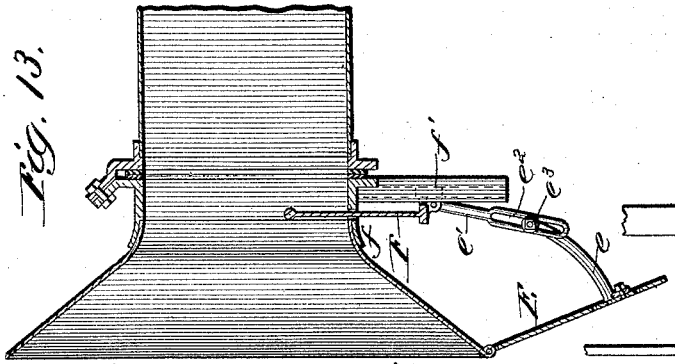


Fig. 15.

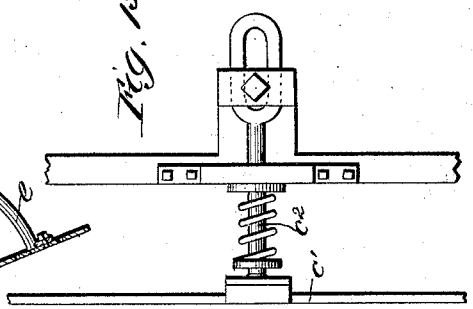


Fig. 12.

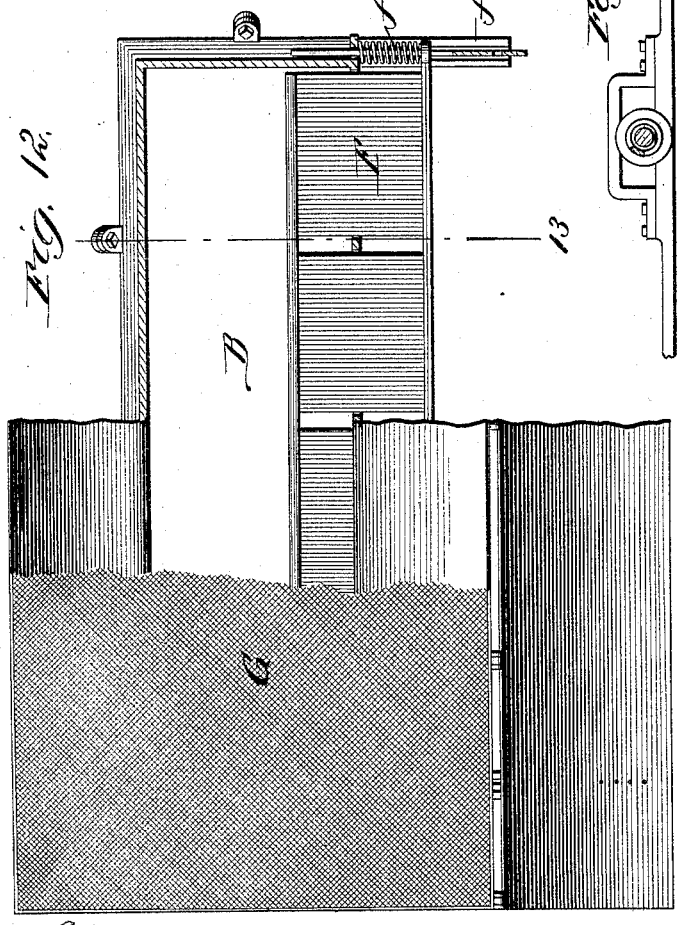
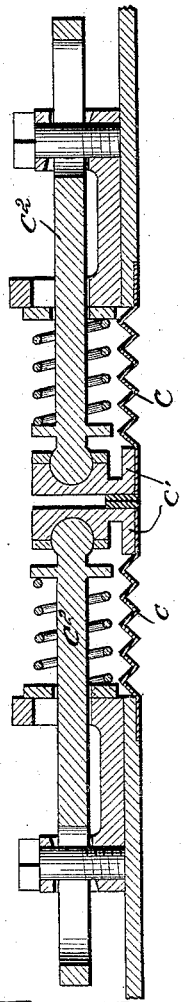


Fig. 15ª.

Fig. 14



Witnesses.
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VENTILATING APPARATUS FOR RAILWAY CARS IN TRAINS.

No. 489,908. Patented Jan. 17, 1893.

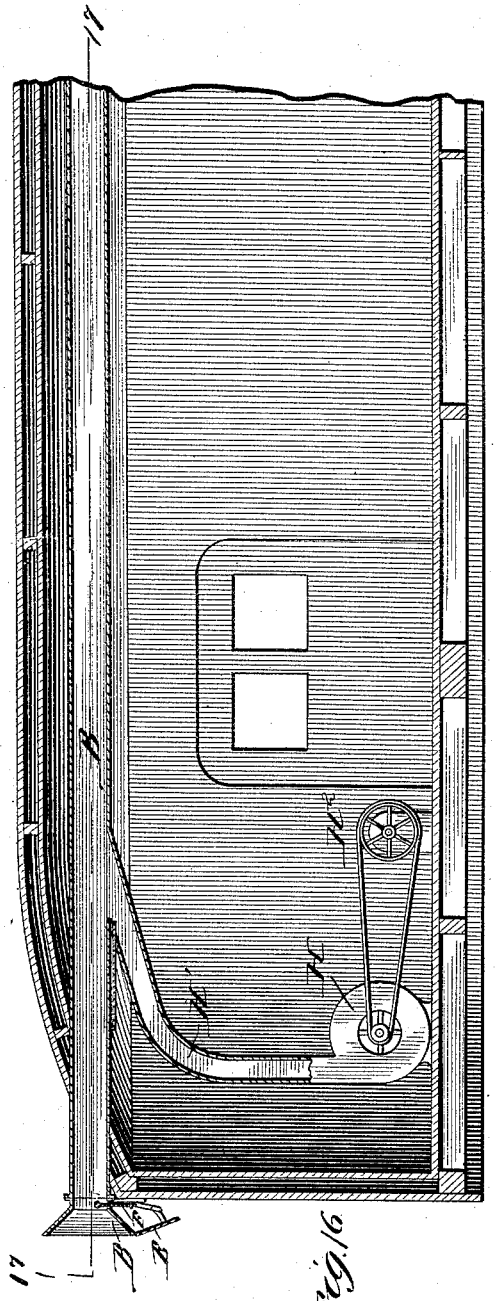

Fig. 16.

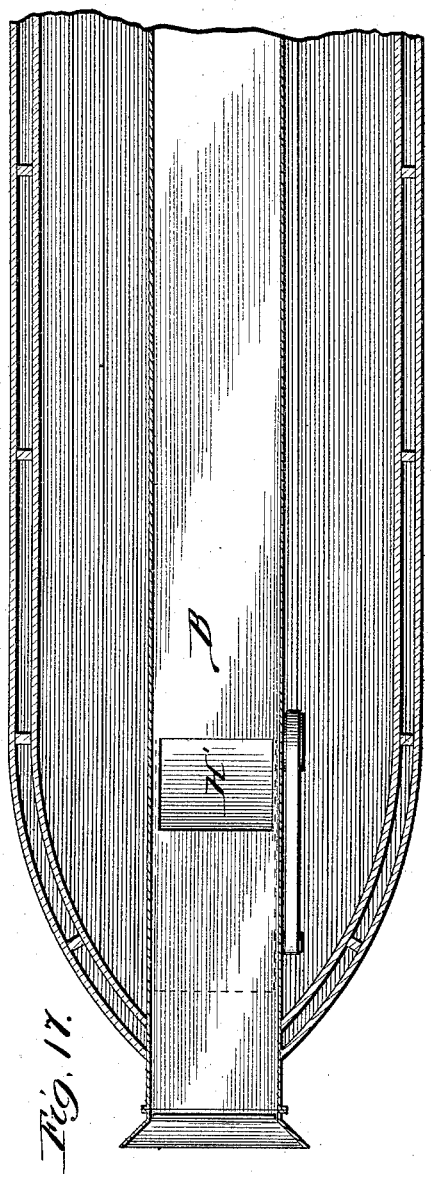

Fig. 17.

Witnesses.
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VENTILATING APPARATUS FOR RAILWAY CARS IN TRAINS.

No. 489,908. Patented Jan. 17, 1893.

Fig. 18

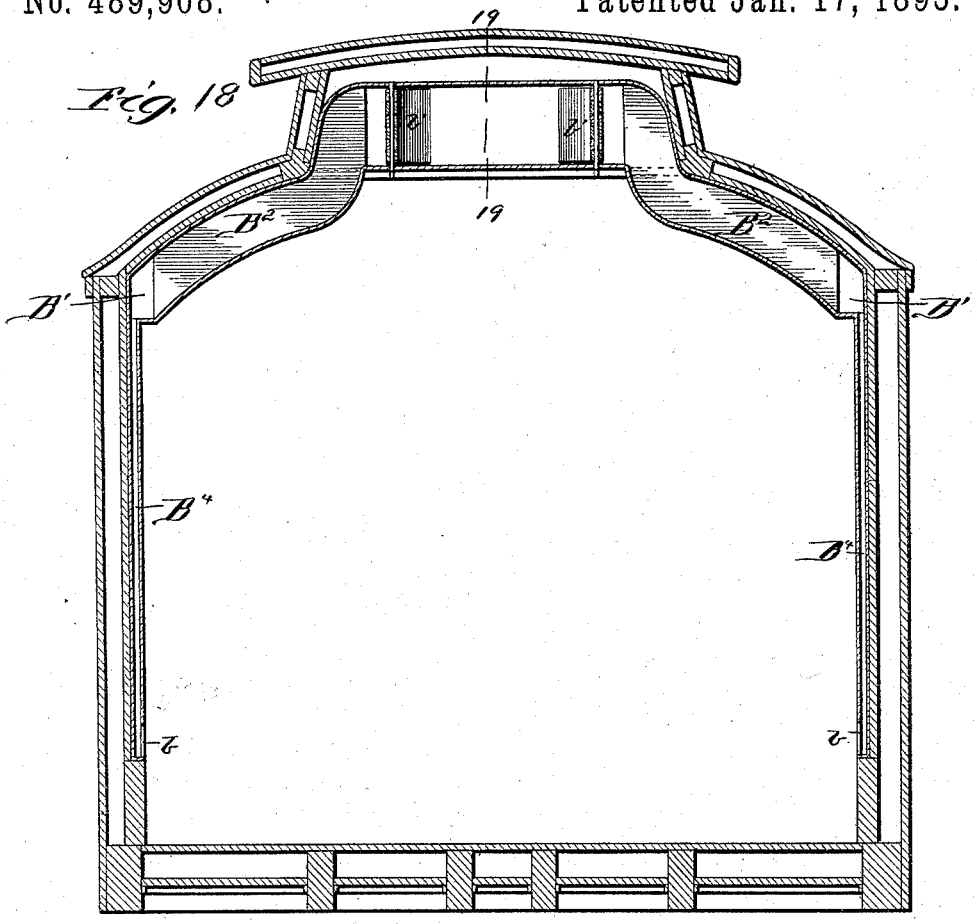
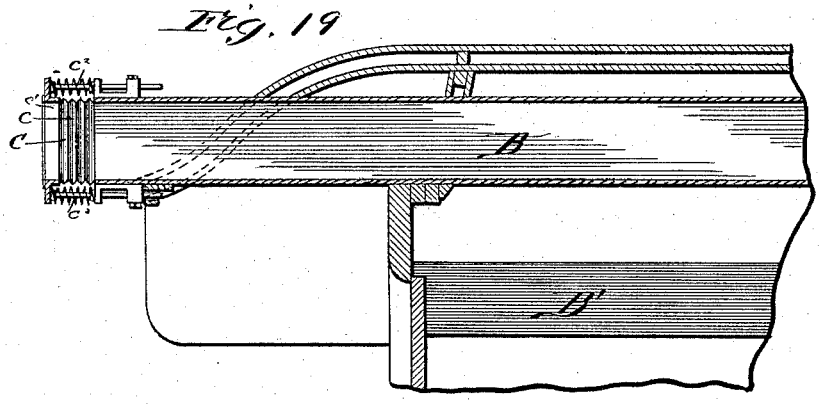


Fig. 19



Witnesses.
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Attys.

UNITED STATES PATENT OFFICE.

FREDERICK U. ADAMS, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO ROBERT S. McCORMICK, OF SAME PLACE.

VENTILATING APPARATUS FOR RAILWAY-CARS IN TRAINS.

SPECIFICATION forming part of Letters Patent No. 489,908, dated January 17, 1893.

Application filed November 24, 1891. Serial No. 412,924. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK U. ADAMS, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Air-Supplying Apparatus for Railway-Cars in Trains; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention has reference to the supply of fresh air to the interior of railway trains and to its distribution to different parts of each car.

In the accompanying drawings the invention is illustrated in connection with a passenger train having some other improvements not herein described.

Figure 1 is a plan or top view of a railway train provided with my improvement and also illustrating a construction of the exterior of the train which is not claimed in this specification. Fig. 2 is a side view of the part of the train seen in top view in Fig. 1. Fig. 3 is a side view illustrating a modification of the construction shown in Figs. 1 and 2. Fig. 4 is a top view of the construction shown in Fig. 3. Fig. 5 is a central, vertical, longitudinal section of portions of two adjacent cars of a train containing my improvement. Fig. 6 is a vertical, transverse section in the line 6—6 of Fig. 5. Fig. 7 is an end view of the upper portion of a car containing my improvement and having the main air duct of said improvement located at the top of the car. Fig. 8 is a horizontal section in the line 8—8 of Fig. 6. Fig. 9 is an enlarged side view of the upper and adjacent end portions of two connected cars of a train, a portion of the side of one of the cars being broken away. Fig. 10, is a horizontal, longitudinal section in the line 10—10 of Fig. 5 of the proposed main air duct showing branches leading therefrom and adjustable deflectors for directing a portion of the air flowing in the main duct into said branches. Fig. 11 is a central, vertical, longitudinal section of main air duct in the line 11—11 of Fig. 10. Fig. 12 is a front view partly in transverse vertical section of the mouth or air-receiving end of the main air duct. Fig. 13 is a vertical, longitudinal section of the mouth of the main air duct in the line 13—13 of Fig. 12. Fig. 14 is an enlarged, vertical, longitudinal section of the supporting device for one of the extensible and flexible extremities of the section of the main air duct which belongs to an individual car. Fig. 15 is a top view of the construction shown in Fig. 14. Fig. 15^a, is a fragmentary elevation and partial section of the device of Figs. 14 and 15. Fig. 16 is a vertical, longitudinal section of a portion of a "service" car for a train containing my improvement. Fig. 17 is a horizontal section in the line 17—17 of Fig. 16. Fig. 18 is a transverse vertical section of a car of ordinary form provided with my improvement. Fig. 19 is a fragmentary vertical, longitudinal section in the line 19—19 of Fig. 18.

A represents a railway passenger car provided (as seen in Fig. 5), with seats *a a* arranged transversely to the car in the usual way.

B is a main air duct passing the entire length of the car, either in the overhead position shown or in any other position that may be preferred. B′ B′ are also longitudinal air ducts arranged one at each side of the car at either the top or the bottom and connected with the main duct by transverse branches B^2 B^2.

B^4 B^4, are vertical ducts in the side of the car leading from the longitudinal ducts B′ B′, as indicated, and provided with openings *b b* at any desired elevation and in any desired position with respect to the seats *a a*.

C C are suitable flexible or flexible and extensible couplings by which the main duct B of one car may be joined and made continuous with that of another car. The air will be admitted to the main duct at some convenient or desirable point at the head of the train, and as it passes backwardly through the duct, it is directed by suitable mechanism into the branches and is finally delivered into the car interior through the openings *b b*.

Deflecting devices adapted to regulate the amount of air sent from the main duct B into a branch B^2, and thence through the openings *b b* into the car, are shown at B^5 Figs. 8, 10, and 11. Of these deflector devices *b′* is a

long plate arranged vertically on its edge within the duct B, and desirably extending from the bottom to the top wall of the duct, being pivoted at one end upon a vertical pivot b^2, located opposite the middle of the inlet opening to the branch B^2. One of these pivoted plates b', extends lengthwise of the duct in each direction and from the same or an adjacent pivot a shorter plate b^3 extends to or into the mouth of the said branch B^2. The two plates b' may be made integral, if desired. Suitable means, operable from the outside of the duct, will be employed to shift the position of either plate b', such means being shown as an external knob b^4, having a shank which extends through a curved slot b^5, in the lower wall of the duct into connection with the deflector plate. The deflector plate being given any desired inclination to the adjacent side wall of the duct B, and having its outwardly projecting end toward the head of the train, a corresponding quantity of air will be led from the main duct into the branch. The pressure of the air against the short plate b^3 may, if said plate be properly mounted, be relied on to push it against the rear side of the branch opening.

Providing two plates b', one projecting toward each end of the car, adapts the device for operation when the car is running in either direction and by providing such deflectors in each car of a train, the air supply for each car may be independently regulated with a reference to the consumption of its predecessors in the train. The opposite deflectors may be adapted to meet each other, as indicated, by dotted lines in Fig. 10, so that they may close the duct of the rear car, and thus compel the distribution through the train of all air admitted to the duct.

Any suitable air outlet or outlets from the car being provided, as, for example, indicated at D in Figs. 6, 7, and 9, the induction and distribution devices described will afford supply of fresh air in determinable quantities to all parts of the car. With such provisions moreover, it is manifest that the windows of the car need never be opened and that perfect air supply and ventilation may therefore be obtained without admission of dust or the production of offensive air currents. It may be assumed that the windows shown are incapable of being opened and this feature, in combination with distributing ducts and air outlet devices, is made the subject of one of the hereto appended claims.

The discharge openings $b\,b$, are shown provided with screen coverings to arrest the dust and they may also, if desired, be provided with individual registers of any preferred construction.

The coupling C for uniting sections of the main duct may be of any desired construction so far as it concerns other parts of the invention. The form of such coupling shown comprises a hollow flexible and extensible portion c, attached to the end of each duct, a hollow metal frame c' attached to the outer end of the flexible part c, provided with means for attachment to the similar frame belonging to an adjacent car, and a vibratory support or supports c^2. The first of these, to-wit, the flexible and extensible prolongation c of the duct B, is shown as being of the "accordion" form, being of any material suitable for flexure in that form. The second part or the hollow end frame c', has a flat end face adapted to make close contact with the similar end frame of the next car, and is provided with lugs c^3, which project forwardly on all sides so as to embrace its fellow, whereby the two meeting end frames of adjacent duct sections hold each other laterally in place. The supports c^2 are metal rods pivoted or universally jointed at their outer ends to central points of the end frames c' and having both vibratory and lengthwise movement with respect to the end of the car. This construction is indicated more clearly in the enlarged views shown in Figs. 14, 15, and 15^a.

As above stated, the main duct may be arranged to take fresh air from any chosen point at or near the head of the train. Two such arrangements are herein shown, one in Figs. 1 and 2, in which the mouth of said duct is at the front end of the car next the tender, and the other in Figs. 3 and 4, in which the duct is branched, the branches extending forwardly at opposite sides of the tender. In either of these positions it will take pure air only, since the emanations from the smoke stack will pass above it.

In Figs. 12 and 13 an automatic valve is shown applied to the mouth of the main air duct by which it is proposed to secure a regular supply of air to the cars notwithstanding variations in the speed of the train. Here E is a vane or flap hinged to a margin of the mouth of the duct B, and normally hanging or standing in a plane transverse to the car or duct. F is a valve adapted to narrow the duct inlet or passage being shown as a slide entering the duct through a slot f in the bottom, to which bottom the flap E is also hinged. Between the flap and the valve are suitable connections through which a backward movement of the flap on its hinge will produce an inward thrust of the valve and a corresponding contraction of the duct passage. These connections, as shown, comprise a curved arm e, attached to the flap E, and a link e' pivotally connected with both the arm and the valve. The link is shown as having a slot e^2 to receive the pivot bolt e^3, by which it is connected to the arm e to permit adjustment. The point of connection between the link and the valve is supported by a guide f' and a spring f^2 is arranged to normally open the valve. As indicated in Fig. 12, a set of like connections is applied to each end of the valve, the latter being of considerable length.

It is manifest that the greater the wind pressure upon the flap E, the more it will be inclined backwardly from its normal plane

and the farther the valve F will be thrust inward and the entrance of air to the duct B restricted. But with this greater air pressure there will be a correspondingly greater velocity of air within the duct, so that notwithstanding the contraction of the passage a required current of air will reach the interior of the car.

In Fig. 12 the mouth of the main air duct is covered with a screen G, which may be used or not as found desirable.

Figs. 16 and 17 show a "service" car containing a fan blower H which delivers into the main duct B, through a supply branch H', said blower being intended for use when the train is standing or when for any reason a sufficient current is not induced through the open mouth of said duct. The blower will be driven by a motor H^2 located on the car, as shown.

I claim as my invention.

1. In a railway car, the combination of a longitudinally arranged main air-supply duct, longitudinal ducts at the sides of the car connected with the main duct and vertical ducts leading from the said side ducts and discharging into the car interior.

2. In a railway car, the combination with a main air-supply duct having a branch leading therefrom for the delivery of air to the car interior, of two oppositely directed deflecting plates within the main air duct hinged at a point opposite the opening into the branch, and at a distance therefrom, and an additional pivoted plate projecting from the junction of the two oppositely directed plates toward the branch opening.

3. In a railway car the combination, with a main air supply duct having opposite branches leading therefrom for the delivery of air to the car interior at opposite sides of the car, two deflecting plates arranged within the main air duct on opposite sides thereof and hinged or pivoted on vertical axes in position to deflect air from the main duct into said branches and adapted to have their free ends brought together, or practically so, for the purpose of closing the main duct to the escape of air at its rear end.

4. The combination with an air duct B, applied to a railway train, of a movable vane E, arranged to present its face to the air pressure encountered by the train, a movable valve F, applied to the duct, a link connection between the vane and the valve arranged to produce a closing movement of the valve by a rearward movement of the vane and a spring or springs arranged to produce an opening movement of the valve.

5. In apparatus for supplying air to the interior of railway cars, the combination, with a rigid portion of a main air supply duct connected with a car body, of a flexible and extensible prolongation of said duct exterior to the end of the car, a rigid, hollow frame applied to the outer end of the flexible portion, a laterally and vertically yielding support for said frame, and a spring or springs arranged to press the end frame outwardly, the whole being adapted to join with a similar prolongation upon the end of an adjacent car to form a flexible joint in a duct continuous from car to car.

6. In apparatus for supplying air to the interior of railway cars, the combination, with a flexible and extensible prolongation, exterior to the end of the car, of an air duct connected with the body of the car and delivering into its interior, of a rigid, hollow frame at the outer end of said extensible prolongation of the duct, a supporting bar or rod universally jointed to said terminal frame of the duct and having a sliding and vibrating connection with the car, and a spring arranged to press the frame outwardly from the car.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

FREDERICK U. ADAMS.

Witnesses:

M. E. DAYTON,

C. CLARENCE POOLE.