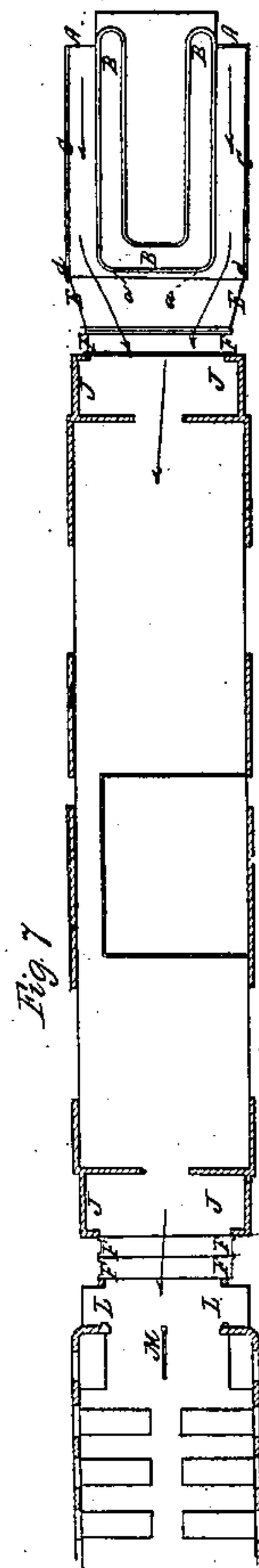
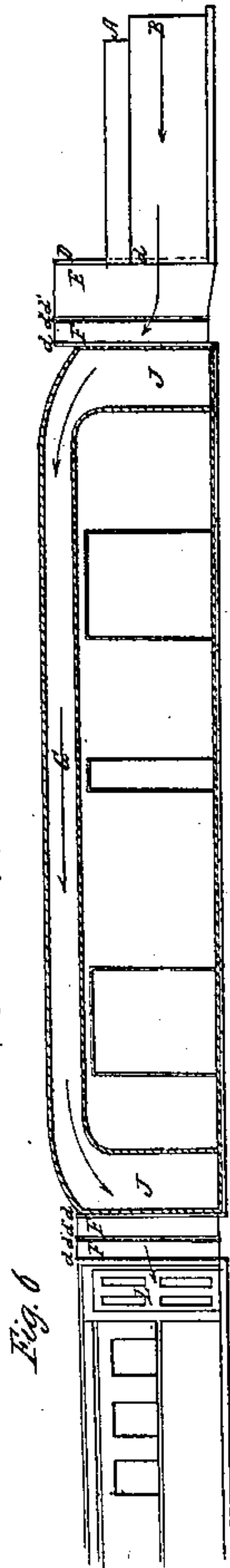
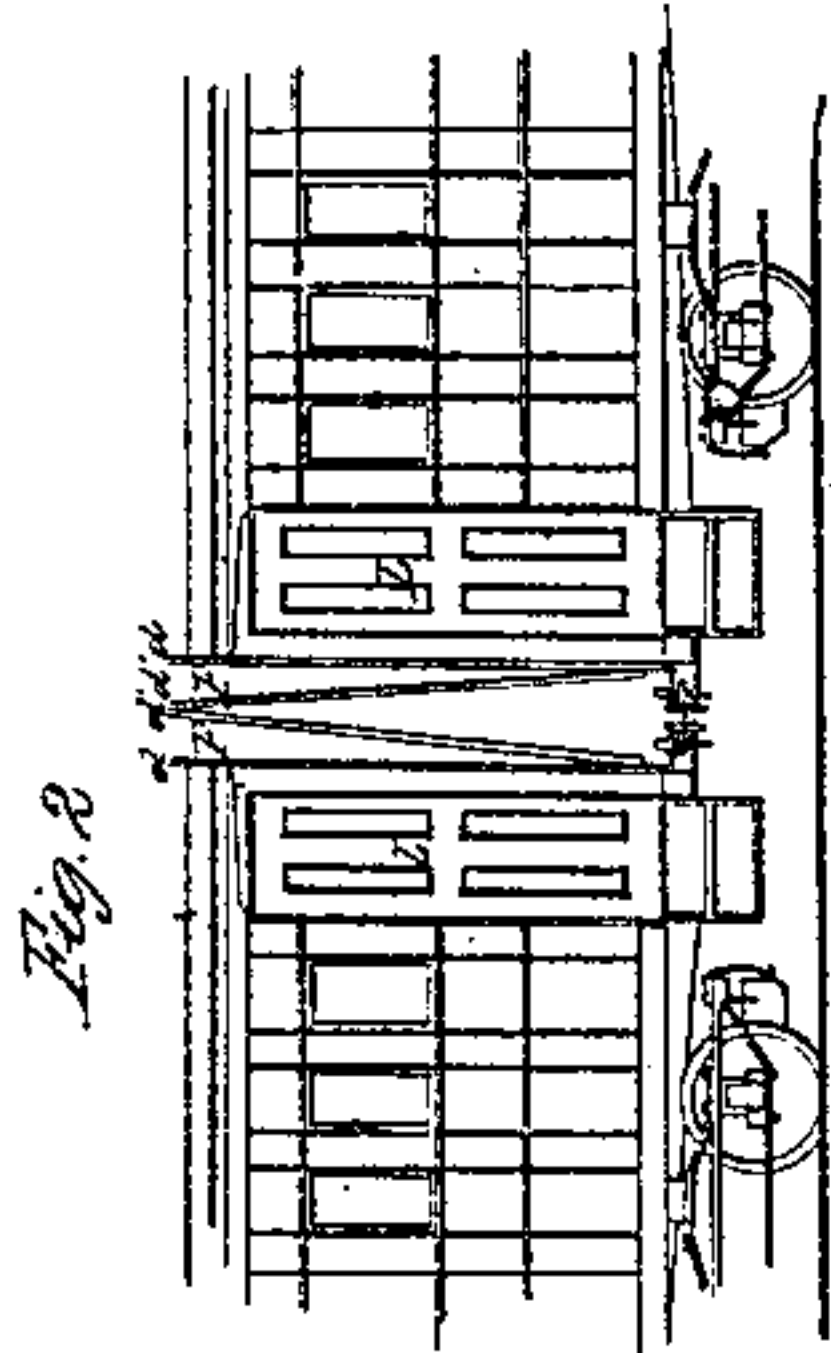
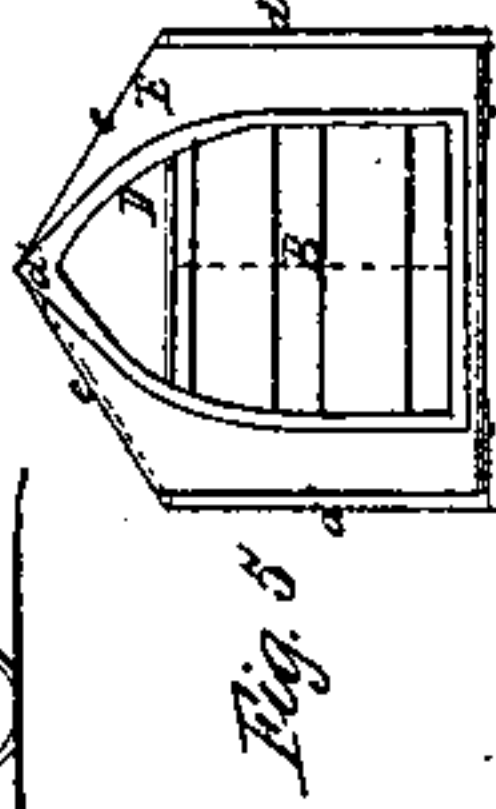
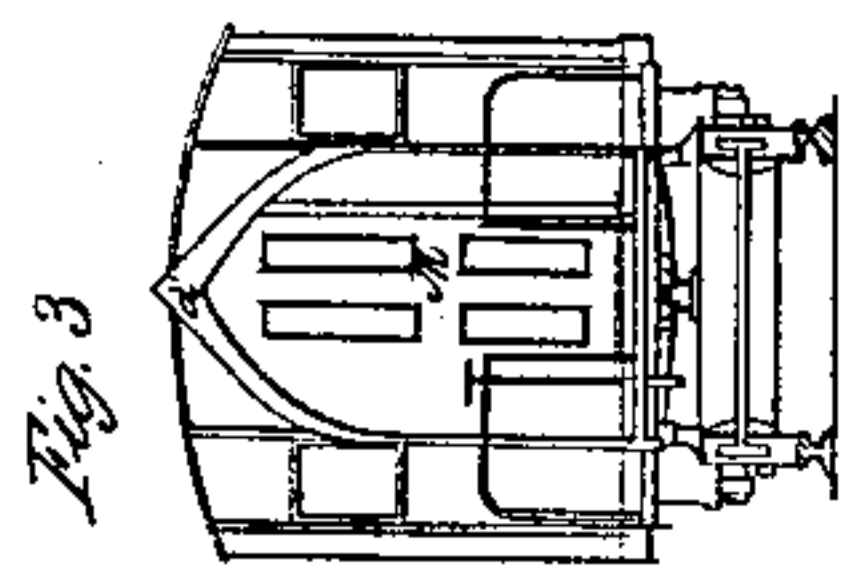
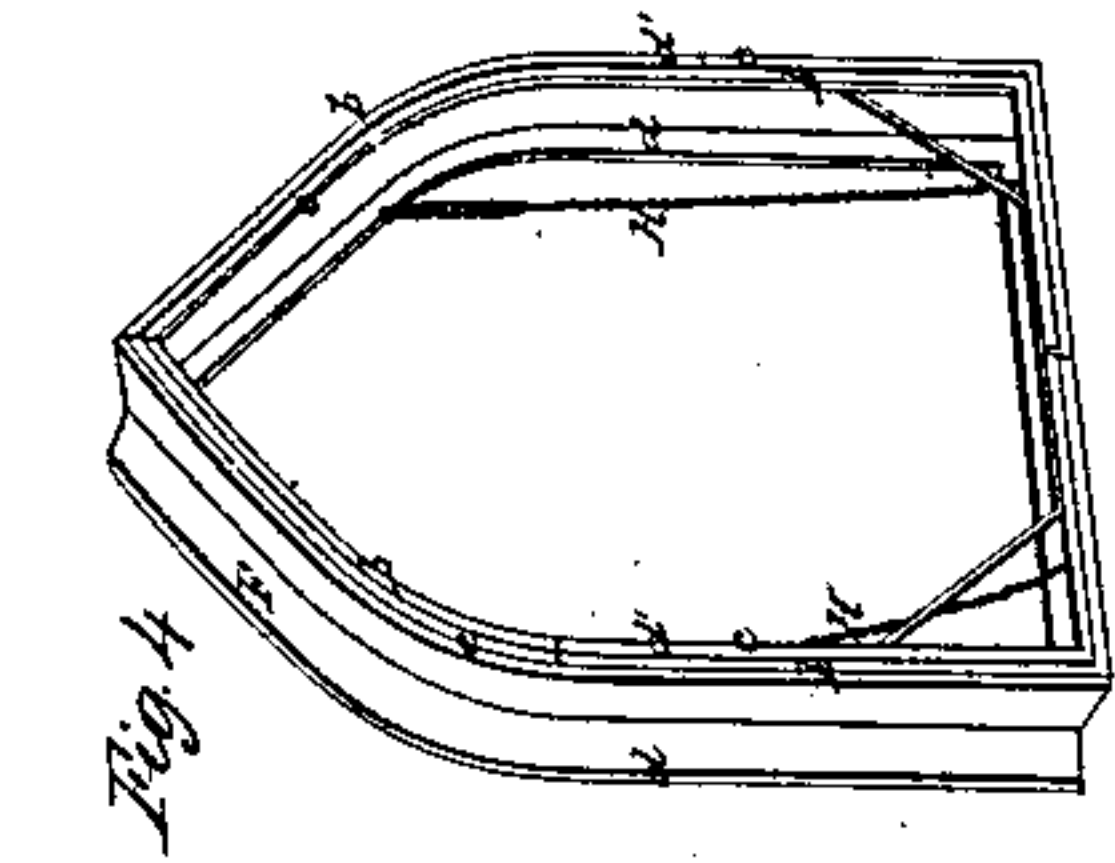
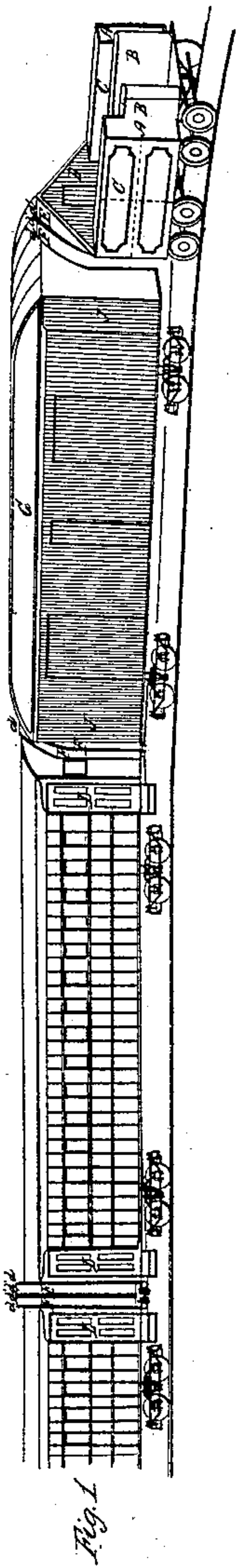


C. ATWOOD.  
VENTILATING RAILROAD CARS.

No. 13,204.

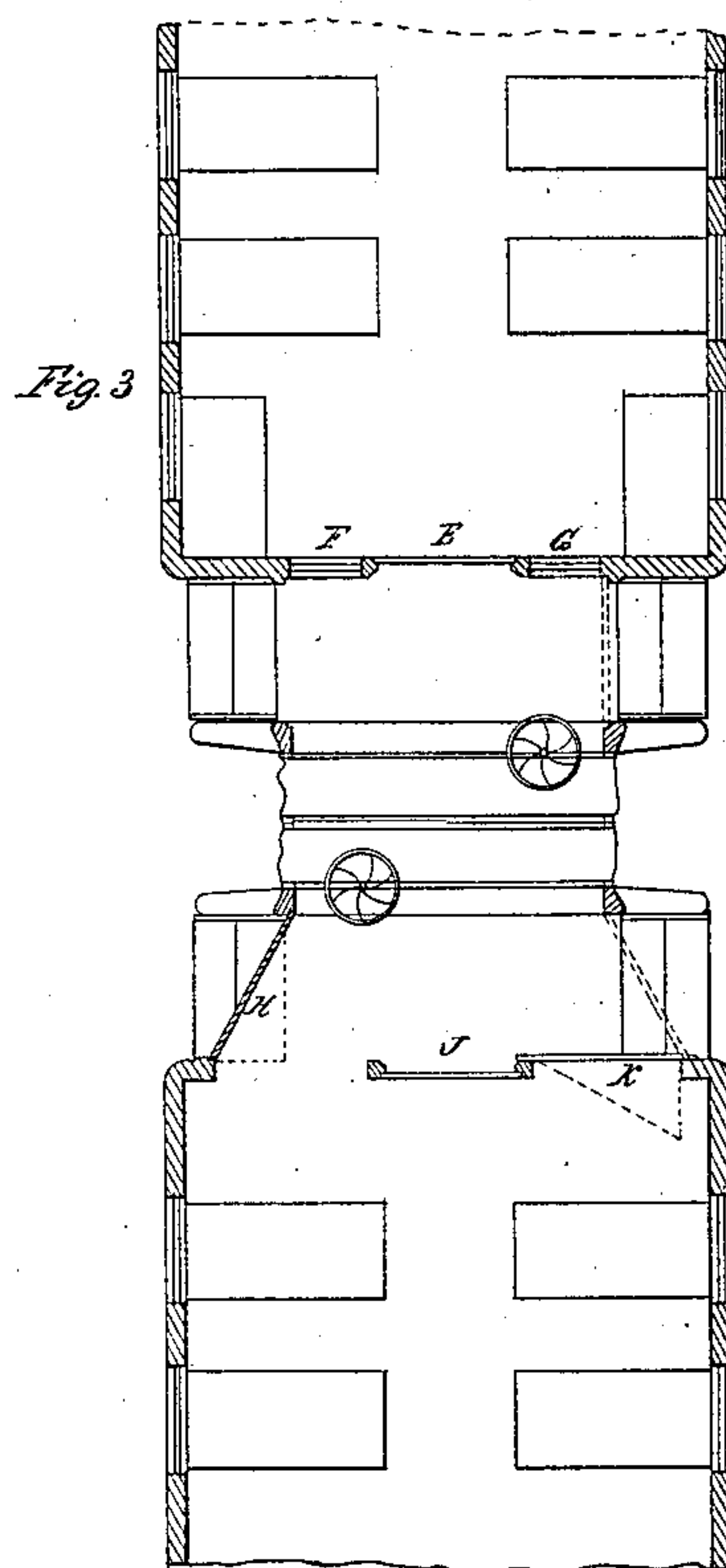
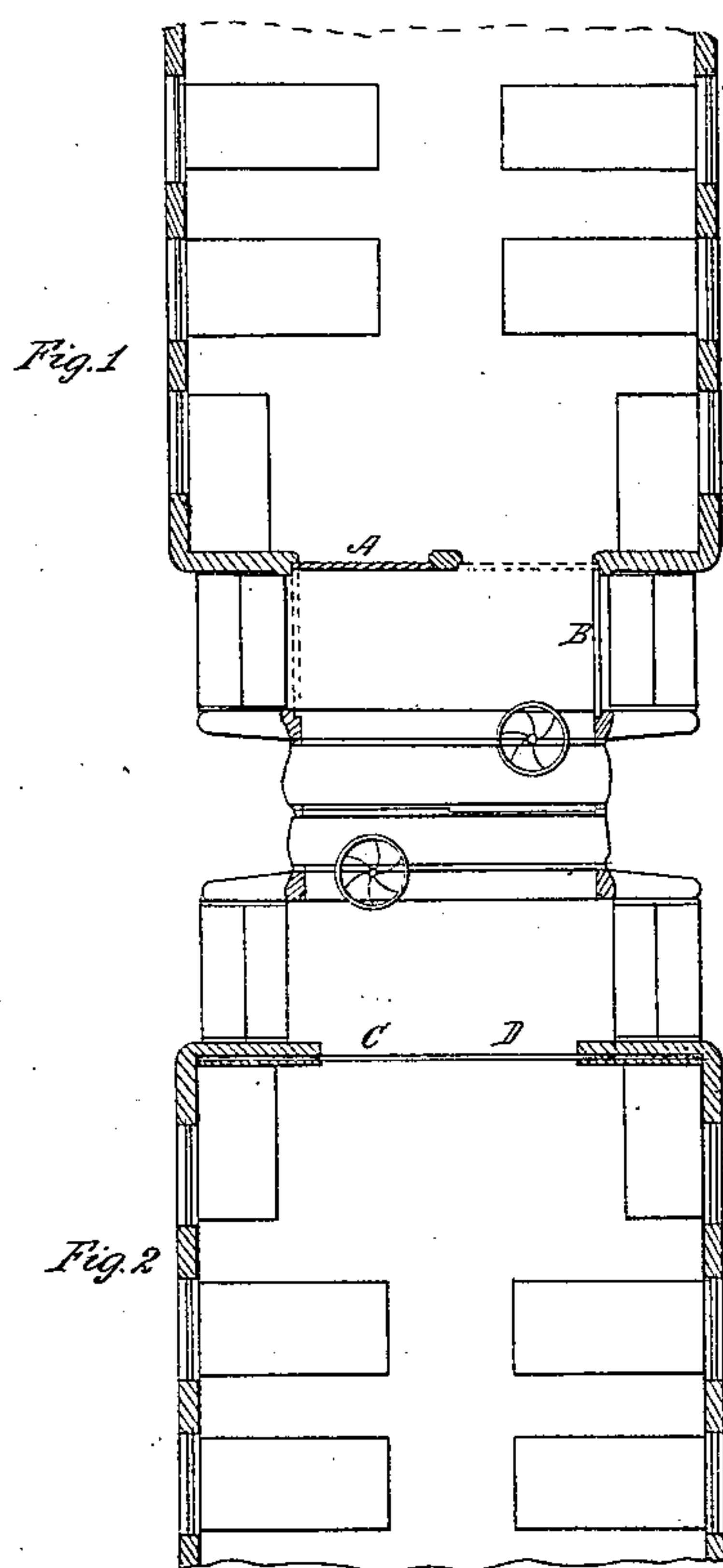
Patented July 10, 1855.



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# UNITED STATES PATENT OFFICE.

CHARLES ATWOOD, OF BIRMINGHAM, CONNECTICUT.

## IMPROVEMENT IN VENTILATING RAILROAD-CARS.

Specification forming part of Letters Patent No. 13,204, dated July 10, 1855.

*To all whom it may concern:*

Be it known that I, CHARLES ATWOOD, of Birmingham, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement on Charles Waterbury's Patent for Ventilating Railroad-Cars; and I do hereby declare that the following is a full, clear, and exact description of the construction, character, and operation of the same, reference being had to the accompanying drawings, which make a part of this specification, in which—

Figure 1 is a perspective view of a part of a train of cars turning a curve, showing the tender, baggage-car, &c., with the improvements attached. Fig. 2 is a vertical plan of a section of the side of two cars, showing the flexible connections open at the bottom (as for attaching or detaching the cars) and the side doors. Fig. 3 is a vertical plan of the end of a car with the flexible connection attached as it will appear when the cars are detached. Fig. 4 is a perspective view of one part of the flexible connection, so much as is to be attached to each end of each car. Fig. 5 is a plan of the flexible connection in a form that may be attached to the rear end of the tender, as indicated in Fig. 7. Fig. 6 is a plan of a longitudinal section cut vertically through the tender, baggage-car, &c., showing the air-passage over the baggage-car. Fig. 7 is a plan of a longitudinal section cut horizontally through the tender, baggage-car, &c.

My improvement consists in the method of receiving the air at the front end of the tender on one or both sides and passing it over the baggage-car, and then into and through the passenger-cars generally or into each car separately for the purpose of ventilating the cars, while all dust, cinders, and smoke are effectually kept out, and in the manner of passing the air over the baggage-car, so that it may not be obstructed or rendered impure by anything in the baggage-car, and in the method of constructing and using the flexible connections by having one part attached to each end of each car and to the rear end of the tender, so that when the ends of any two cars are brought together and coupled the outer frames of the flexible connections may be readily adjusted in such a manner (by means of projections and recesses) as to keep them firmly connected without regard to the

jarring of the cars, or by the effect of turning curves or stopping or starting, and so that the brakemen may be protected from the weather and yet the ingress and egress of passengers will not be obstructed.

The tender, baggage-car, and passenger-cars may all be made in the usual way, except a slight alteration at their ends and an additional ceiling or roof to the baggage-car and air-passages attached to the tender outside of the water-tanks, as hereinafter described and as shown in the drawings, so that the improvement may be readily attached to tenders and cars already in use at a very small expense. To the sides of the tender I attach two air-passages, as seen at C and C, with their front ends open, as seen at A and A, having the outer sides of the tank B B serve for a part of the inner sides of the air-passages, all as seen in Figs. 1, 6, and 7. I make these air-passages C and C of sheet metal or any other suitable material; but I prefer sheet-iron for the sides and wood for the tops and bottoms, and to use the outer sides of the tanks for a part to save expense.

The passages C and C may be carried round the rear end of the tender, so as only to have a sufficient outlet in the central part to communicate by means of the flexible connections with the passage over the baggage-car, or through it or both through and over, as may be thought best in any case. I would recommend that each of these passages C and C should be of a capacity of about six square feet in their cross-section, as that quantity would be needed in a long train on a hot day.

I carry up the rear end of the tender, as shown at D, Figs. 1, 5, and 6, (or in any other convenient shape,) to suit the frame of the flexible connection, (which should be about right-angled at the top, as seen at F E, Fig. 1, and at d', Figs. 3 and 5, to prevent the sparks and cinders resting on the flexible connections,) and to the rear end of the tanks there should be wings, as seen at a a, Fig. 7, to prevent the wind which blows into one side from forcing the air out at the other side, instead of its passing through the cars; and the flexible connections may be attached to the extreme outside of the air-passages on the tender, as represented at E, Figs. 1, 5, 6, and 7, or nearer the center, as shown at F F, Figs. 1 and 7, and in direct plan in Fig. 3, as it is fitted



onto the other cars. I continue the sides of the baggage-car to the ends of the platforms, as shown at I I, Figs. 1, 6, and 7, to connect the passage G over the baggage-car (by means of the flexible connections) with the passages from the tender at one end and with the passenger-car at the other, as shown in Figs. 1, 6, and 7.

In the top of the baggage-car I make an air-passage, as seen at G, Fig. 6, by putting on an additional roof, as seen at G, Figs. 1 and 6, or by putting in a ceiling under the roof, so as to make the passage G of sufficient capacity to give free passage to all the air which comes through the air-passages on the tender, as before described.

I inclose the sides of the platform of the passenger-cars by putting in door-frames at the top of the steps, in which I hang side doors, as shown at L and L, Figs. 1, 2, and 6, and as indicated in section at L and L, Fig. 7. These doors, with their frames, (when shut, as they should always be when the train is in motion,) entirely close the sides of the passage through the cars to the ends of the platform and open inward for the ingress and egress of passengers. The inner door M, Fig. 3, should always be open when the train is in motion to allow a free passage for the air. This door may be made double and open inward, as shown at M, Fig. 7. I make the flexible connections F of leather or any other suitable material and nail or otherwise secure the two edges (completely round) to Gothic frames  $d d$  and  $d' d'$ , all as shown in Fig. 4. The face of the frame  $d d$  I make plain and attach it to the end of the car by screws (or any other suitable fastenings) in the position shown in Fig. 3, and to sustain the weight of the frame  $d' d'$  I attach chains H and H to the upper part of the frame  $d d$  and the bottom of the frame  $d' d'$ , as shown in Fig. 4, so that when there is nothing but the chains H and H to sustain their weight their own gravity will bring the two frames  $d' d'$  to the position shown in Fig. 2, thus making it perfectly convenient to couple or uncouple the cars. After the cars are coupled I bring the bottoms of the two frames  $d' d'$  together, as seen at F F, Figs. 1 and 6, and secure them by clasps or any other suitable contrivances. The faces of the frames  $d' d'$  I fit with projections  $b b b b$  and recesses  $c c c c$ , so that when they are pressed together the recesses on one will receive the projections on the other, and thus hold them perfectly steady. I make the flexible material on the frames of sufficient width to leave some slack when the cars are drawn apart to the utmost extent that their couplings will permit.

Having made the several parts of my improvements as before described, I couple the cars in the usual way, as seen in Fig. 2, bring together the bottoms of the frames  $d' d'$ , as seen at F F, Figs. 1, 6, and 7, and clasp them

as before described, taking care that the projections  $b b b b$  enter the recesses  $c c c c$ , shut the side doors L L, and open the end doors M of all the passenger cars, and the train will be ready to start.

When the train is started, the motion will cause the air to rush into the openings A A on the sides of the tender, pass through in the direction indicated by the darts, the first flexible connection E F, Figs. 1 and 7, over the top of the baggage-car, through the passage G, Figs. 1 and 6, and through the flexible connections F F into the passenger-car, and so through the whole train and out at the rear end of the rear car, thus ventilating the whole with pure air received at the front end of the tender, where no dust, or smoke, or cinders can enter, as from the proximity of the openings A and A to the locomotive they will be above the dust and below the smoke.

To regulate the quantity of air, dampers (in the form of throttle-valves or otherwise) may be fitted in the air-receivers C and C, or the rear door M of the rear car may be partially closed, or both, to reduce the current of air at pleasure.

In making new cars for my method of ventilating instead of having the ordinary door in the center at each end of the car they may be made as indicated in horizontal section in Plate B, where—

Fig. 1 represents two doors, A and B, which open outward, and when thus open they close the side passages across the platform, serving as side doors, as shown at B, Fig. 1. Fig. 2 represents two sliding doors. Fig. 3 represents a door E in the center with two large panels F and G to slide vertically for passages for the air. In Figs. 2 and 3 side doors should be made, as in Plate A. Fig. 4 represents three doors H I K. The door I in the center is the ordinary door in the ends of the cars for ingress and egress of passengers. H and K are doors opening outward, which when opened serve as side doors, as seen at H, with a foot-board H K to cover a part of the steps. The doors H and K are open to the position of H when the train is in motion, and closed, as at K, when the train is stopped to leave the steps free.

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

1. The method herein described of constructing, attaching, and using the flexible connections when constructed, attached, and used substantially as herein set forth.

2. The combination of the flexible connections with any suitable method of receiving the air at the front end of the tender.

CHARLES ATWOOD.

Witnesses:

S. THOMPSON,  
R. FITZGERALD.