

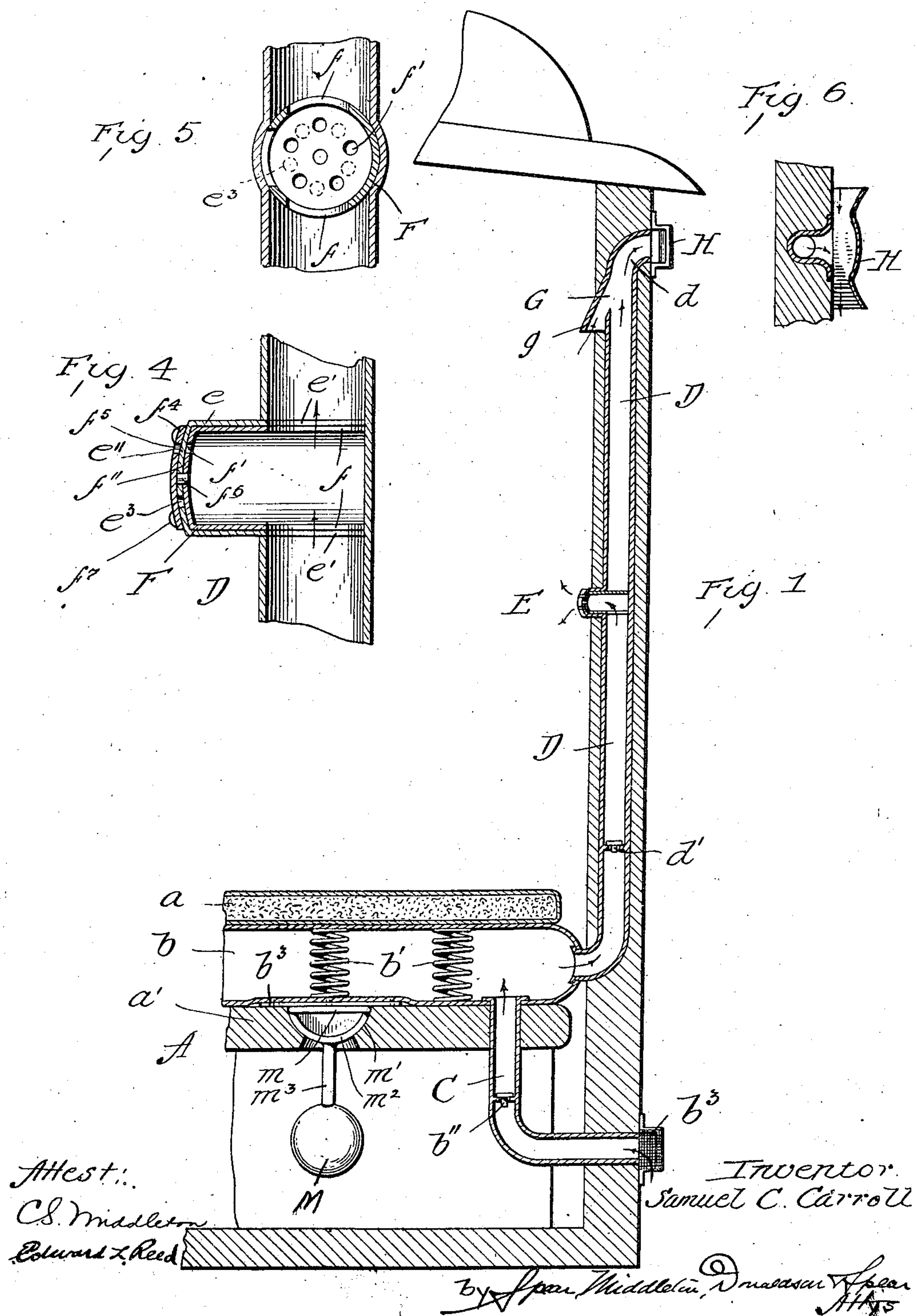
No. 847,238.

PATENTED MAR. 12, 1907.

S. C. CARROLL.  
VENTILATING SYSTEM FOR VEHICLES.

APPLICATION FILED JULY 8, 1905.

3 SHEETS—SHEET 1.



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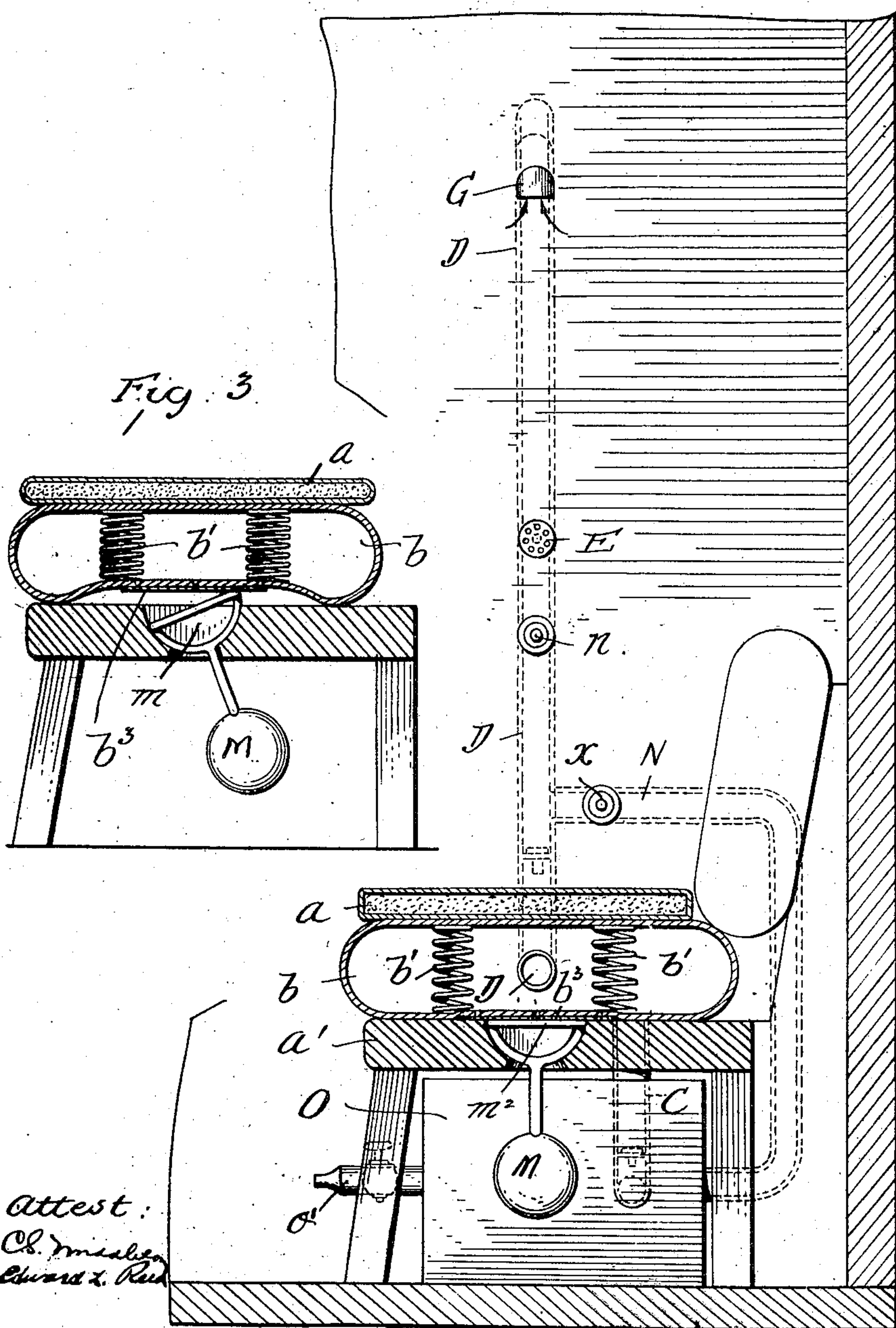
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3 SHEETS—SHEET 2.

Fig. 2



Attest:  
Ch. Muesel  
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Inventor:  
Samuel C. Carroll.  
by *James Middleton, Attorney*



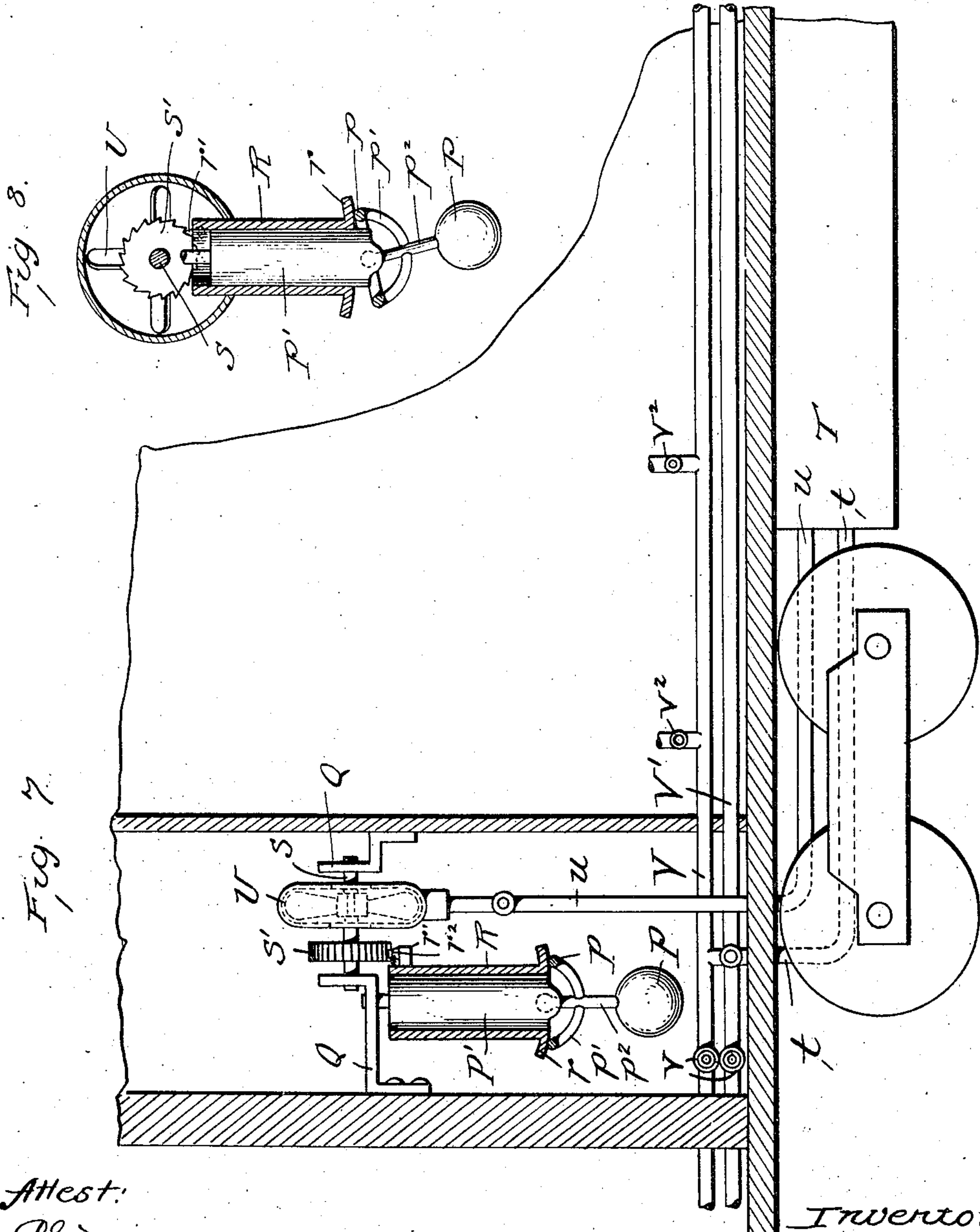
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3 SHEETS—SHEET 3.



Attest:

Ed. Middleton  
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# UNITED STATES PATENT OFFICE.

SAMUEL C. CARROLL, OF DALLAS, TEXAS.

## VENTILATING SYSTEM FOR VEHICLES.

No. 847,238.

Specification of Letters Patent.

Patented March 12, 1907.

Application filed July 8, 1905. Serial No. 268,807.

*To all whom it may concern:*

Be it known that I, SAMUEL C. CARROLL, a citizen of the United States, residing at Dallas, Texas, have invented certain new and useful Improvements in Ventilating Systems for Vehicles, of which the following is a specification.

My invention relates to means for ventilating moving vehicles—such as street-cars, cabs, boats, and closed vehicles of all kinds—and consists in providing such closed vehicles with air-pipes communicating with the interior of the vehicles and with the exterior atmosphere and connecting such pipes with an air-pump adapted to draw in the fresh air and expel the foul air, which is operated by the motion of the vehicles.

The term "vehicle" as employed in the accompanying specification and claims is intended to include road-carriages, street-cars, railway-cars, cabins on boats, and closed vehicles of any kind whatever.

Referring to the accompanying drawings, Figure 1 is a transverse section of a portion of a carriage, showing one form of my invention. Fig. 2 is a longitudinal section of the same. Fig. 3 is a section of a seat, showing the operation of the weight. Figs. 4 and 5 are details of the outlet-nozzle. Fig. 6 is a detail of the hood over the outlet-pipe. Fig. 7 is a sectional view of one end of a car, showing my invention as operated by a weight-motor. Fig. 8 is a detail of the weight-motor.

In carrying out my invention in its preferred form I utilize the swaying and bouncing movement of the vehicle caused by the unevenness of the road-bed or by the rapid motion of the carriage to operate an air-pump, whereby a circulation is maintained in the vehicle. One method of accomplishing this is that shown in Fig. 1 of the drawings in which I utilize the weight of the passenger, in connection with the movement of the vehicle, to operate the air-pump. The ordinary vehicle-seat is indicated at A, having a cushion *a*, supported by the usual base *a'*. Interposed between the cushion *a* and the base *a'* is a bellows, which may be of any desired construction, that shown in the drawings consisting of a collapsible bag *b*, having the springs *b'* to hold the same in a distended position. Connected to this bag or bellows is an inlet-pipe C, which extends through the wall of the vehicle, preferably at a point near the bottom; but it may be connected with

the outer atmosphere at any desired point. This pipe is provided at a point near its connection with the bag *b* with a check-valve *b''* and at its outer end with a screen *b<sup>3</sup>* to exclude any foreign matter. A second or outlet pipe D is also connected with the bag *b* and extends upward to a point *d* near the top of the vehicle and then passes through the walls of the same to the outer atmosphere. This pipe is also provided with a check-valve *d'* near its point of connection with the bag *b*. At a point intermediate the bag or bellows and the point of connection with the outer atmosphere the pipe D is provided with an outlet-nozzle E, which is provided with a valve that may be operated to close the pipe D to the outer atmosphere and open it to the interior of the carriage. The nozzle E may be of suitable construction; but I prefer that shown in the drawings, which is in the form of a cylindrical valve having an outer cylinder *e* formed in the pipe D and of a diameter equal to that of said pipe. This outer cylinder is open at the top and bottom, as shown at *e'*, and one end of the same projects out beyond the side of the pipe and has over the outer end thereof a cap or plate *e''*, having a series of openings *e<sup>3</sup>* therein. Journaled within the cylinder *e* is a second or inner cylinder F, provided with openings *f*, adapted to register with the openings *e'* of the cylinder *e*. The outer end of the cylinder F is also closed by a plate or cap *f''*, provided with a series of openings *f'*, adapted to register with the openings *e<sup>3</sup>* of the cylinder *e*. The openings *f'* and *e<sup>3</sup>* of the cylinders F and *e* are so arranged in relation to the openings *e'* and *f* of said cylinders that when the openings *e'* and *f* are in alinement to form a passage through the pipe D from the bag *b* to the outer atmosphere the openings *e<sup>3</sup>* and *f'* will be out of alinement and the pipe D cut off from communication with the interior of the vehicle, and vice versa.

The inner cylinder F is provided at its outer end with any suitable means for revolving it, such as an outer cap or plate *f<sup>4</sup>*, which has openings *f<sup>5</sup>* in alinement with the openings *f'* of the cylinder F and is rigidly connected thereto in any suitable manner, as by a bolt *f<sup>6</sup>*, so that when the cap *f<sup>4</sup>* is turned the cylinder F will also be turned. The cap *f<sup>4</sup>* may be provided with projections or corrugations *f<sup>7</sup>* to facilitate the turning of the same.



In the upper portion of the pipe D and near where that pipe passes through the wall of the vehicle there is provided an opening G, which may have a cap or lip *g*, extending over the same and forming a funnel leading thereto. Where the end of the pipe D extends through the wall of the vehicle into the outer atmosphere it is provided with an elongated hood H, which extends for a considerable distance on either side of the pipe end. This hood is flat on one side and is secured firmly to the side of the vehicle; but the outside face is concaved, so that the hood is of less diameter at the center than it is at the ends, which may or may not be flared outwardly.

From the foregoing description it will be apparent that when the vehicle is moving the jolting or swaying thereof will cause the weight of the passenger to rise and fall on the seat A, thus causing the bellows *b* to be alternately contracted and expanded, thereby drawing the fresh air through the pipe C and forcing it into the interior of the vehicle through the pipe D and nozzle E. At the same time the forward movement of the vehicle causes the air to rush through the hood H, past the end of the pipe D, creating a suction in the pipe D and drawing the warm air from the upper part of the vehicle through the opening G. If for any reason, such as the coolness of the air, it is desirable to exclude from the vehicle a part or all of the air drawn in by the bellows, the valve in the nozzle E may be turned to allow the proper amount of air to enter the vehicle and the remainder to pass through the pipe D to the outer air.

I have also shown in these figures a device whereby the bellows or air-pump may be operated when the seat is unoccupied or when it is undesirable to use the weight of the passenger for operating the same. This device consists of a weight M, which is suspended under the seat from a universal joint, which may be of any desired construction, that shown in the drawings consisting of a ball-and-socket joint *m*, formed by cutting away the base of the seat to form a semispherical recess *m'*, and providing the weight M with a rod *m<sup>3</sup>*, having a semispherical bearing or head *m<sup>2</sup>*. The upper edge of this semispherical head is so arranged that when the weight M is at rest it will be flush with the upper surface of the base of the seat; but when the weight swings with the motion of the vehicle one edge of the head *m<sup>2</sup>* will rise above the surface of the base and compress the bag *b*, which may be provided with stiffened portion *b<sup>3</sup>* to more effectively compress the same. It will of course be understood that I may use either of the constructions described separately or that I may use both at the same time.

To provide for ventilation when the vehi-

cle is at rest, I may insert a cut-off valve *n* in the pipe D at a point below the outlet E, as shown in Fig. 2, and connect to the pipe below the cut-off a pipe N, leading to a storage-tank O, which may be located in any convenient place adjacent to the seat, that shown in the drawing being located beneath the seat. This tank is provided with an outlet *o'* for releasing the air and creating the desired circulation; or I may place a regulating-valve *x* in the pipe N and by opening the cut-off valve in pipe D allow the air from the tank to pass out through the pipe D and nozzle E.

When it is desirable to apply the invention to vehicles in which it would be impracticable to employ the construction hereinbefore described—as in stock-cars, fruit-cars, or in passenger-cars running over a highly-improved road-bed—I may employ a motor adapted to be actuated by the swaying motion of the vehicle which is always present in rapidly-moving vehicles. This motor may be employed to operate an air-pump in connection with a circulating device, such as has already been described, and it may also be employed in connection with an air-compressor adapted to charge an air-tank while the vehicle is in motion, the air from such tank being utilized to keep up a circulation in the vehicle when the same is at rest. The type of motor which I prefer is that shown in Fig. 7. This figure shows a section of a car having an apartment at one end in which the motor and fan are mounted. The motor there shown consists of a weight suspended by a universal joint from a cylindrical support P', which is carried by the bracket Q. Fitting over the cylindrical support P' and sliding on the same is a cylindrical casing R, having at its lower end an upwardly-inclined flange *r*, against which bears a ring *p*, carried by the arms *p'*, which in turn are supported on the stem *p<sup>2</sup>* of the weight P. Near the upper end of the casing R is a projection *r'*, carrying a spring-pressed pawl *r<sup>2</sup>*. A shaft S is journaled in the brackets Q and Q', and on this shaft is mounted a ratchet-wheel S', adapted to be engaged by the pawl *r<sup>2</sup>* upon the rise of the casing R. Also mounted on this shaft is a blower-fan U of ordinary construction, the outlet from which is connected by the pipe *u* with the storage-tank T, which may be located in any desirable place about the car, that shown in the drawings being secured beneath the body of the car. This storage-tank is connected by the pipe *t* with a circulation system within the car; but it may be desirable for the sake of economy and convenience to connect this air-supply to the steam-heating pipes which are already in the car, as it would not be necessary to use the two systems at the same time. Such connection may be made by inserting the necessary cut-offs *v* in the heating-pipes V V' and



connecting the air-pipe *t* to the flow-pipe *V*, which may be provided with one or more outlets within the car, or it may be connected at each seat by a pipe *v*<sup>2</sup> with a ventilating-pipe, such as is shown at *D* in Fig. 1. The operation of the device will be readily understood. As the car sways back and forth the weight *P* is oscillated and the ring *p* forced against the flange *r* of the casing *R*, which slides up on the guide or support *P'*, bringing the pawl *r*<sup>2</sup> into engagement with the ratchet-wheel *S'* and rotating the fan *U*, thereby forcing the air into the tank *T*.

The mechanism which I have shown for operating the fan from the weight is a very simple one and does not form a part of my invention, it being understood that any suitable transmitting-gear may be used and gearing interposed to turn the fan at any desired speed.

When it is desirable to dispense with the storage-tank and use the air direct from the fan, this may be done by substituting an ordinary ventilating-fan for the blower-fan, as shown in Fig. 8.

While primarily intended for use as a ventilating system, my invention may be used for a variety of purposes whenever the rocking motion is present to operate the weight-motor, as for fumigation on shipboard, &c.

Having described my invention, what I claim is—

1. In a vehicle; the combination with an air-pump and means actuated by the motion of the vehicle for operating said pump, of an inlet-pipe, an outlet-pipe and means for connecting said outlet-pipe with either the interior of the vehicle or the outer atmosphere, substantially as described.

2. In a vehicle, the combination with an air-pump and means actuated by the motion of the vehicle for operating said pump, of an inlet pipe extending from said air-pump through the wall of said vehicle at a point near the bottom thereof, an outlet-pipe extending from said pump through the wall of the said vehicle near the top thereof, and a valve in said outlet-pipe intermediate the ends thereof for connecting said pump with either the outer atmosphere or the interior of said vehicle, substantially as described.

3. In a vehicle the combination with an air-pump, means for operating the same and an inlet and an outlet pipe, of a valve in said outlet-pipe comprising an outer cylinder extending across said pipe and beyond the periphery thereof, openings in the periphery of said cylinder in alignment with said pipe and openings in the outer end of said cylinder, an inner cylinder within said outer cylinder, openings in the periphery of said inner cylinder adapted to register with the openings in the periphery of said outer cylinder, openings in the outer end of said inner cylinder

adapted to register with the opening in the end of said outer cylinder when the openings in the peripheries of said cylinders are out of alinement, and means for rotating said inner cylinder, substantially as described.

4. In a vehicle the combination with an air-circulating system, of an air-pump connected therewith and placed under the seat of the vehicle and adapted to be operated by the weight of the passenger in connection with the motion of the vehicle, substantially as described.

5. In a vehicle the combination with an air-circulating system, of a bellows connected therewith and adapted to carry the weight of the passenger and to be operated by the rise and fall of said weight due to the motion of the vehicle, substantially as described.

6. In a vehicle the combination with an air-circulating system and the vehicle-seat, of a bellows forming a part of said seat and connected with said circulating system, said bellows being actuated by the movement of the passenger due to the motion of the vehicle, substantially as described.

7. In a vehicle the combination with an air-circulating system, the vehicle-seat and the cushion therefor, of a bellows located between said seat and said cushion and connected with said circulating system, said bellows being actuated by the movement of the passenger occupying the seat due to the motion of the vehicle, substantially as described.

8. In a vehicle the combination with an air-circulating system and a two-part seat, of a collapsible bag located between the parts of said seat and connected with said circulating system, and springs for holding said bag in a distended position, said bag being actuated by the movement of the person occupying the seat due to the motion of the vehicle, substantially as described.

9. In a vehicle the combination with an inlet-pipe and an outlet-pipe extending through the wall of said vehicle near the top thereof, of an elongated hood secured to said vehicle and inclosing the end of said outlet-pipe, said hood being of a depth equal to the diameter of said outlet-pipe and of less diameter at the center than at the ends thereof, substantially as described.

10. In a vehicle the combination with an air-circulating system and the vehicle-seat, of a bellows forming a part of said seat and connected with said circulating system, said bellows being actuated by the movement of the person occupying the seat caused by the motion of the vehicle and additional means actuated by the movement of the vehicle for actuating the bellows.

11. In a vehicle the combination with an air-circulating system and the vehicle-seat,



of a bellows forming a part of said seat and  
connected with said circulating system, said  
bellows being actuated by the movement of  
the person occupying the seat caused by the  
5 motion of the vehicle and additional means  
actuated by the movement of the vehicle  
for actuating the bellows, said means con-  
sisting of a weight having a semispherical

head carried by the seat, said head actuating  
the bellows when the weight oscillates. 10

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

SAMUEL C. CARROLL.

Witnesses:

HENRY E. COOPER,  
EDWARD L. REED.