No. 853,435. PATENTED MAY 14, 1907.

H. S. BLACKMORE.

AUTOMATIC APPARATUS FOR STERILIZING, DISINFECTING, OR ODORIZING VEHICLES.

APPLICATION FILED MAR. 26, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

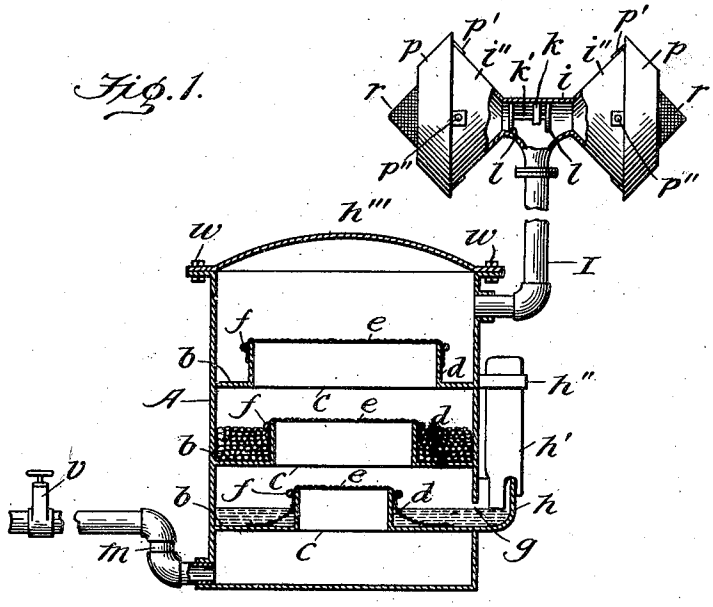
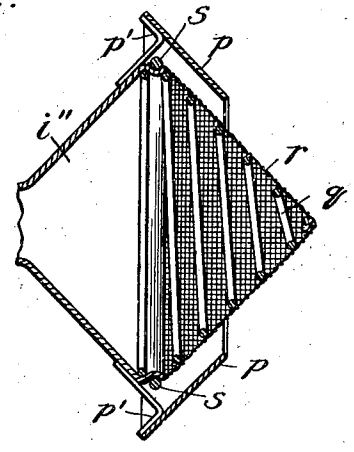


Fig. 2.



Witnesses

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AUTOMATIC APPARATUS FOR STERILIZING, DISINFECTING, OR ODORIZING VEHICLES.

APPLICATION FILED MAR. 25, 1905.

2 SHEETS—SHEET 2.

Fig. 3.

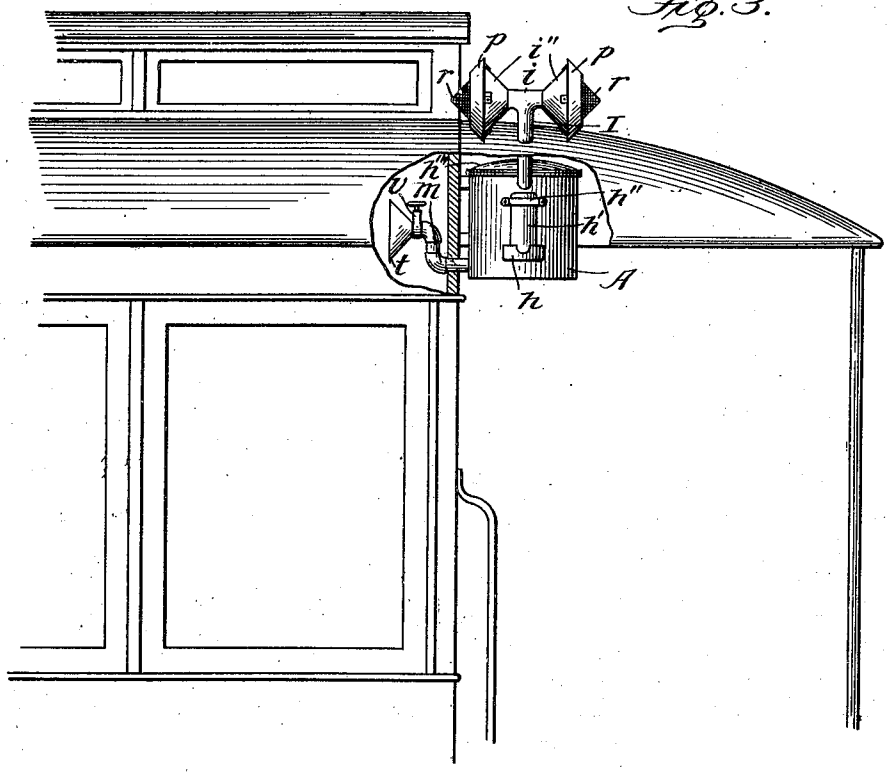
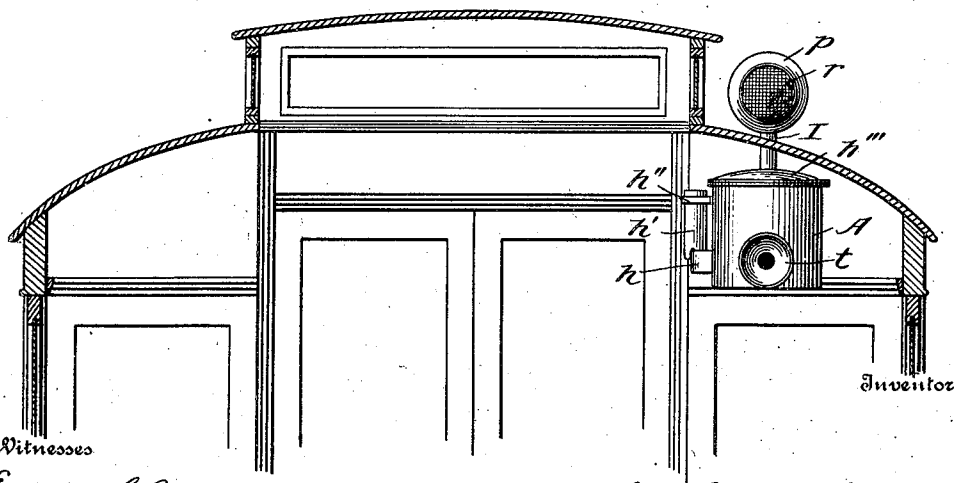


Fig. 4.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC APPARATUS FOR STERILIZING, DISINFECTING, OR ODORIZING VEHICLES.

No. 853,435. Specification of Letters Patent. Patented May 14, 1907.

Application filed March 25, 1905. Serial No. 252,047.

To all whom it may concern:

Be it known that I, HENRY SPENCER BLACKMORE, a citizen of the United States, residing at Mount Vernon, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Automatic Apparatus for Sterilizing, Disinfecting, or Odorizing Vehicles, of which the following is a specification.

This invention relates to an apparatus for automatically purifying and disinfecting or odorizing the air or atmosphere of cars or other vehicles by the action of purifying, disinfecting or odorizing substances automatically associated with the current of air entering said cars or vehicles, through the medium of a device whereby the air is caused to enter the car or vehicle through the purifying apparatus by the movement of the vehicle to which the apparatus is attached, the said apparatus being provided with a means whereby the entering air is automatically caused to pass through the same and is charged or associated with disinfectant or odorizing substances and purified from dust and deleterious contaminations, whereby the air in cars and vehicles is caused to circulate and is kept in a pure and healthful condition automatically with the movement of the vehicle.

My new and improved apparatus consists of new and novel features, as hereinafter more clearly set forth, reference being had to the accompanying drawings, in which

Figure 1, is a vertical transverse section of my apparatus for automatically purifying and disinfecting or odorizing the air or atmosphere of cars. Fig. 2, is a longitudinal transverse section of one of a pair of funnel-shaped air-receivers provided with a conical screen and means for holding same in yielding and extended position. Fig. 3, represents a section of a car, with a portion of the roof and platform-nood broken away to show the apparatus, as when located outside of the car, and its discharge pipe extending therein. Fig. 4, is a vertical transverse section of a car with the apparatus located therein.

On the drawing, the letter A designates the disinfecting or purifying chamber, preferably of cylindrical form, and provided interiorly with a series of shelves or trays *b*, each provided with a central opening *c* surrounded by a wall *d*, the openings and their walls increasing in diameter from the bottom tray up. A gauze *e* is secured by a metal band or ring *f* over the top of each walled opening, the gauze of the lower tray being of any capillary fabric material and of such size that its edge shall spread over a good portion of the bottom of its tray.

An opening *g* is made in one side of the casing A for the inflow of a liquid disinfectant or odorizing substance from a cup *h*, located at the outside of said opening, the said cup being fed from a liquid receptacle *h'* which is supported by the said cup and a metal band *h''* connected with the upper part of the casing A, as shown in Figs. 1, 3, and 4 of the drawings.

The disinfecting or purifying chamber A is provided with an imperforate cover *h'''*, the air passing into the upper part of the said chamber A through a pipe I, the upwardly-extended end of which is surmounted by a horizontal section *i*, the opposite ends of which are provided with funnel sections, or wind-receivers *i'*, *i''*, the flared ends or mouth of each being adapted to engage the base *s* of a spiral or conically wound wire spring *q*, over which is fitted a gauze covering *r*. A conical ring *p* is connected by lugs *p'* with the mouth of each wind-receiver *i'*, *i''*, as shown in Fig. 2, to stiffen the receivers as well as to insure a draft around the rear of the gauze covering, and thereby free same of dust or other substance which might otherwise accumulate thereon. The horizontal section *i*, between the wind-receivers, is provided with an internal guide *k*, in which is fitted a sliding rod *k'*, having circular plates *l*, *l*, secured to the opposite ends thereof, to close the base of the funnels when brought in contact therewith.

The lower part of the casing A is provided with an outlet-pipe *m*, having a rectangular valve *v* and a funnel-shaped discharge end, as shown at *t*, Fig. 3.

The cover *h'''*, of the purifying and saturating compartment A, is adapted to be secured in position by means of screw-bolts and nuts *w*, so that access may be had to the interior of the said compartment. Thus the

various gauzes may be removed successively, and replaced, and the apparatus cleaned and recharged whenever same may be deemed necessary.

It will be further noted that the air-purifying and disinfecting compartment is provided with a series of shelves surrounding the gauze diaphragms, so that the first compartment is adapted to separate the dust from the entering air, which, by reason of the circulating air above it, causes the dust to accumulate upon the shelf first next to the inlet. The second or central shelf, about the second gauze diaphragm, is adapted to be filled with a substance, such as sodium peroxid, which is capable of absorbing carbon dioxid or sulfurous gases, or other similar impurities, from the entering air, with the generation of a corresponding amount of pure oxygen dislodged from the sodium peroxid by the action of the impurities absorbed thereby. In this way, the filtered air, free from dust, passing from the first diaphragm to the second, is charged with oxygen which takes the place of the aforementioned impurities separated by the chemicals in the central compartment. The filtered and purified air then passes on to the third compartment, the shelf or channel about which is filled with a disinfecting ingredient, such as a solution of formic aldehyde in essential oils, which, upon evaporation, serves the double purpose of supplying a disinfectant and perfuming agent to the air passing through. The gauze communicating with this channel, or compartment, is preferably of fibrous nature, such as asbestos, or some textile material, so that by capillarity, the disinfecting and odorizing fluid is carried up from the channel about the diaphragm and this saturates the textile gauze through which the purified air passes, and whereby, in passing through the said gauze, the air becomes saturated with odorizing and disinfecting contents of the fluid. The disinfecting and odorizing fluid in the channel about this textile gauze diaphragm is kept automatically filled to a uniform level by means of the feed device h' communicating with the cup h on the exterior of the apparatus, as hereinbefore described.

One of the important and distinguishing features of my invention lies in the fact that the entering cones, through which the air passes from a direction opposite to that of the moving vehicle, are provided with a means for separating dust, cinders, and other impurities, such as gauze r, which gauze is automatically cleared of adhering dust, cinders, or other substances, which might naturally accumulate thereon, by a means communicating therewith in such a manner that the gauze is maintained in a vibratory condition during its operation, which means, as specifically illustrated, constitutes a spiral spring placed inside of the filtering gauze. Another important and distinguishing feature of my invention is the fact that it is actuated by the movement of the device into a body of air or atmosphere, which movement of the device is essential to its operativeness, and an important feature in combination with the air-purifying, disinfecting, and odorizing apparatus through which the air passes to the interior of the vehicle to which attached, for the purpose of supplying to the interior of the vehicle, a purified, disinfected, and healthful atmosphere, the device being operated by forcing it into a body of air by the action of the moving vehicle with which it is in combination, so that a current of air is introduced into the vehicle through the apparatus in a direction opposite to that in which the vehicle is traveling, the device naturally creating a current of air by being forced into or against the resistance of the atmosphere at a speed greater than that at which the atmosphere, exterior to or surrounding the vehicle, is traveling.

It can thus be seen that the combination of the device, as hereinbefore set forth, with a moving vehicle, produces a new and useful result, the utility of the device being gaged or governed by the speed with which the vehicle travels, while the purified and disinfected air entering the vehicle through the device, will be regulated and controlled at will by a means so located as to obstruct or release the current of air against the pressure created by the moving vehicle, such as valve v.

It can be readily seen that a device of the character and of a size so small as to be inoperative with relation to the purifying and disinfecting of bodies of air of a relative capacity to the cars or vehicles in combination with which the smaller apparatus is combined, would be comparatively useless, were it not for the fact that its operation is actuated by the resistance created by the moving vehicle against the body of air into which it is forced during such movement. A greater result is therefore obtained from a smaller device when operated in combination with the moving vehicle in accordance with my invention.

By employing an apparatus of this character it can be seen that four important results are obtained: First, the separation of dust and suspended impurities from the air by mechanical filtration; second, the removal of contaminating gaseous impurities by chemical action; third, simultaneously supplying oxygen for the separated gaseous impurities; and fourth, the charging of the purified and revitalized air with substances

having disinfectant and perfuming qualities, all of which results are produced in a simple and automatic manner by the passage of the air through the apparatus controlled by the valve *v*, and entering into the same through the inlet ducts controlled by automatic means for directing the air therein from a body of air forced into the apparatus by the funnel-shaped exterior device being forced into the atmosphere by the moving vehicle, all of which results can be clearly appreciated.

The term "vehicle," as employed in this specification and claims, is intended to imply a moving or movable structure, such as cars, wagons, sleds, boats, or other devices employed as means of transportation, in contradistinction to the term as employed in chemistry or physics implying a solvent or suspending or carrying medium of fluid nature.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. An apparatus for supplying disinfected and purified air to vehicles, comprising the combination with a vehicle of an air purifying, disinfecting, or odorizing device, provided with a duct through which air is introduced, an air intake, vibrating means for diverting solids in the air from the path of the air intake, and means actuated by the motion of the vehicle for discharging the purified air into the said vehicle.

2. An apparatus for supplying disinfected and purified air to vehicles, comprising the combination with a vehicle of an air purifying, disinfecting, or odorizing device, provided with a duct through which air is introduced, an air intake, means for imparting a motion to solids in the air in an angular direction to and out of the path of the air intake, and means actuated by the motion of the vehicle for discharging the purified air into the said vehicle.

3. An apparatus for supplying disinfected and purified air to vehicles, comprising the combination with a vehicle of an air purifying, disinfecting, or odorizing device, provided with a duct through which air is introduced, an air intake, an air filter, means actuated by the motion of the vehicle for removing solid matter separated thereby therefrom, and means actuated by the motion of the vehicle for discharging the purified air into the said vehicle.

4. An apparatus for supplying disinfected and purified air to vehicles, comprising the combination with a vehicle of an air purifying, disinfecting, or odorizing device, provided with a duct through which air is introduced, an air intake, a movable air filter, means for moving the filter when subjected to air pressure, and means actuated by the motion of the vehicle for discharging the purified air into the said vehicle.

5. An apparatus for supplying disinfected and purified air to vehicles, comprising the combination with a vehicle of an air purifying, disinfecting, or odorizing device, provided with a duct through which air is introduced, an automatically operated valve actuated by air pressure due to motion communicating with said duct, an air intake, a movable air filter communicating with said intake, means for moving said filter, and means actuated by the motion of said vehicle for discharging the purified air into the vehicle.

6. In an apparatus for disinfecting air supplied to vehicles, the combination with an air-purifying and disinfecting or odorizing receptacle and a duct through which the air is introduced, of a funnel-shaped inlet provided with an automatically operated valve actuated by the air pressure due to motion, the said funnel-shaped inlet being provided with a flexible air filter and with a means for imparting a vibratory motion to the filter when subjected to air pressure.

7. In an apparatus for disinfecting air supplied to vehicles, the combination with an air-purifying and disinfecting or odorizing receptacle and a duct through which the air is introduced, of a funnel-shaped inlet provided with an automatically operated valve actuated by the air pressure due to motion, the said funnel-shaped inlet being provided with a conical flexible air filter and with means for imparting vibratory motion to the filter when forced into a body of air.

8. In an apparatus for disinfecting air supplied to vehicles, the combination with an air-purifying and disinfecting or odorizing receptacle, of a duct through which the air is introduced, a funnel-shaped inlet provided with an automatically operated valve actuated by the air pressure due to motion, the said funnel-shaped inlet being provided with a conical flexible air filter and with means for imparting vibratory motion to the filter when forced into a body of air, and means for diverting and removing dust or other accumulations from the air-filtering medium.

9. In an apparatus for disinfecting air supplied to vehicles, the combination with an air-purifying and disinfecting or odorizing receptacle, of a duct through which the air is introduced, a funnel-shaped inlet provided with an automatically-operating valve actuated by the air pressure due to motion, the said funnel-shaped inlet being provided with a conical flexible air filter and at its interior surface with a conical spiral spring for imparting a vibratory motion to the filter when forced into a body of air.

10. The combination with a device for

purifying air supplied to vehicles having a means actuated by the motion of the vehicle for purifying and discharging purified air into said vehicle, of a means for supplying oxygen to said air in transit.

11. The combination with a device for purifying air supplied to vehicles having a means actuated by the motion of the vehicle for discharging purified air into said vehicle, of a means for automatically supplying oxygen to said air.

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

HENRY SPENCER BLACKMORE.

Witnesses:
H. N. JENKINS,
C. C. WRIGHT.