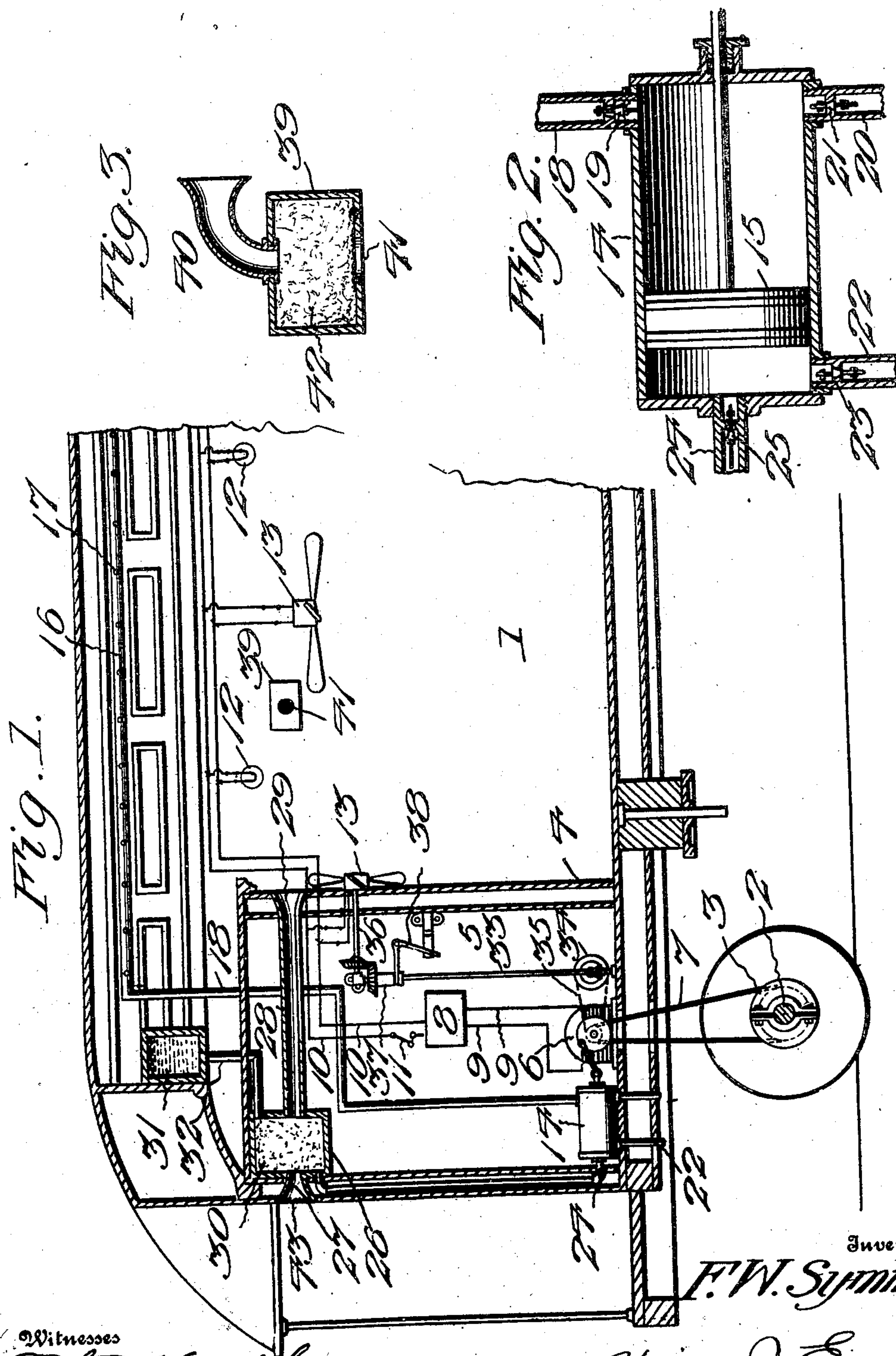


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VENTILATOR.

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# UNITED STATES PATENT OFFICE.

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## VENTILATOR.

No. 847,381.

Specification of Letters Patent.

Patented March 19, 1907.

Application filed December 16, 1905. Serial No. 292,073.

*To all whom it may concern:*

Be it known that I, FREDERICK W. SYMMES, a citizen of the United States, residing at St. Matthews, in the county of Orangeburg and State of South Carolina, have invented new and useful Improvements in Ventilators, of which the following is a specification.

The invention relates to an improvement in ventilating systems designed, primarily, for application to railroad-cars or other power-driven vehicles.

The main object of the present invention is the production of means whereby the vehicle may be effectively lighted and supplied with filtered fresh air during its travel or while at rest, the invention further comprehending an improved means for drawing the vitiated air from the vehicle.

The invention will be described in the following specification, reference being had particularly to the accompanying drawings, in which—

Figure 1 is a vertical sectional view of the forward end of the car, illustrating the application thereto of my invention. Fig. 2 is an enlarged sectional view of the pump for use in my system, the piston being shown in elevation. Fig. 3 is an enlarged sectional view of one of the ventilators.

Referring to the drawings, 1 represents the car or other vehicle, on the axle 2 of which is supported a drive-pulley 3, preferably split for convenient connection with the axle. One end of the car is divided by a vertical partition 4 to provide a compartment 5, in which the operating mechanism of the system is arranged. Within this compartment is mounted a generator 6, driven from the split pulley through the medium of a belt or sprocket 7. A series of storage-cells 8 are arranged within the compartment 5 and in electrical connection with the generator through conductors 9, whereby during the operation of said generator the current is stored in the cells. A light and fan circuit 10 leads from the storage-cells, being controlled by a switch 11. The circuit 10 extends throughout the length of the car and to desired points thereof, being designed to energize the lights 12 and fans 13, positioned at any desirable or convenient points in the car. Each of the lights and fans of course are to be provided with their individual switches, whereby any one or more may be cut out without disturbing the others.

The ventilating system is operated through

the medium of a pump 14, comprising a suitable cylinder, in which is mounted a piston 15, arranged to draw the vitiated air from the car and to draw in a supply of fresh air, as hereinafter described.

16 represents one of a series of pipes arranged, preferably, longitudinally at any desired points in the car, each of said pipes being formed with a series of perforations 17, through which the vitiated air in the car finds its way into the pipe in the operation of the pump. The pipe or pipes 16 communicate, through the medium of a pipe 18, with the pump-cylinder near the rear end thereof, said pipe 18 being provided immediately adjacent said cylinder with a cone-valve 19, opening by gravity toward the cylinder. Immediately and diametrically opposite the inlet of pipe 18 the cylinder is provided with an outlet-pipe 20, provided adjacent the cylinder with a cone-valve 21, opening away from the cylinder. The pipe 20 terminates in an open mouth in communication with the atmosphere beyond the bottom or side of the car. At the opposite end the pump-cylinder is provided with a fresh-air-inlet pipe 22, the free end of which opens to the atmosphere beyond the end or side opening of the car and in which pipe is arranged a cone-valve 23, opening toward the cylinder. A feed-pipe 24 communicates with the end of the cylinder, being provided with an outlet cone-valve 25, opening away from the cylinder. The feed-pipe communicates directly with a filtering-receptacle 26, preferably arranged near the roof or upper end of the compartment 5 and in open communication with the atmosphere through a funnel-pipe 27, opening through the end wall of the car. The filtering-receptacle is in communication with the interior of the car through a discharge-pipe 28, extending longitudinally of the compartment 5 and opening through the partition 4 thereof into the body of the car through a funnel-mouth 29. By preference a suitable filtering medium 30, as sponge or the like, is arranged in the receptacle 26, and in order to maintain this material in the desired condition I provide a tank 31, which is secured to the car above the filtering-receptacle and is in open communication therewith through a pipe 32. The tank 31 is designed to contain water or other desirable fluid by which the filtering medium within the receptacle 26 is maintained in desired moistened or antiseptic condition.



While the car is in motion the pump 14 and generator 6 are driven directly from the car-axle, the lighting and fan system forming the sole demand upon the storage battery.

5 It may be found desirable, however, to mechanically operate the fan system, and to this end I arrange a power-shaft 33, driven by cog-gearing from a belt-wheel 34, operated by a belt 35 upon the generator-shaft.

10 The power-shaft extends vertically of the car and is designed to operate a series of fan-shafts 36, but one of which is shown, leading to the various located fans throughout the car, it being understood that this feature of

15 the invention contemplates the arrangement of the power-shaft and such counter-shafts as may be necessary in order to operate each of the fans. To provide for disconnection of the power and fan shafts in the event of the

20 electrical operation of the fans, I arrange the operating-gear on the power-shaft at the end of a movable sleeve 37, positioned and controlled by a lever 38, whereby said shaft-gear may be moved into or out of coöperation

25 with the hand-shaft gear, as will be obvious.

In connection with the ventilating system described I propose to use independent ventilators, (clearly illustrated in Fig. 3,) these ventilators, which comprise receptacles 39, suitably fixed in the sides of the car

30 and in communication with the atmosphere through a short section of pipe 40, having a flaring mouth, the connection between said pipe and receptacle being such as to permit independent movement of the pipe, whereby

35 to arrange the mouth thereof to open in the desired direction in accordance with the travel of the car. The receptacle 39 is in communication with the interior of the car

40 through a screened opening 41, and said receptacle is adapted to contain a suitable filtering medium 42, through which the air passing through the pipes 40 is compelled to pass prior to its admission to the car. If de-

45 sired, the receptacle 39 may be in communication with a supply-tank similar to 31, whereby to maintain the filtering medium 42 in the desired condition.

During the travel of the car the devices

50 previously described are operated through the medium of the belt 7, driven by the axle of a car, while during the state of rest of the car the parts are operated by the power stored in the storage battery 8, it being understood that in this event even the generator 6 becomes a motor to operate the pump and other parts. In this event, of course,

55 the belt 7 is to be disconnected from operative connection with the axle-pulley 3 by any suitable means, such as an ordinary clutch, whereby the parts may be operated under the influence of the storage battery without operating the belt.

It is to be understood that in ordinary circumstances I contemplate the use of a fresh-

air apparatus at each end of the car, but that I also contemplate the use of but a single apparatus, if desired, and to provide for the location of said apparatus at the end or side of the car, preferring that in the use of but a

70 single apparatus opening from the side or top of the car that the funnel-mouth 21 be of the common reversible type, whereby said funnel-mouth may be turned in the direction of travel of the car to receive a supply of

75 fresh air. The funnel-mouth may be, and preferably is, provided with a screen 43 to exclude foreign matter.

The lights and fans, while illustrated as arranged longitudinally and centrally of the

80 car, may also be arranged in any convenient or desired location, as the situation of these features forms no material part of the present invention.

In the use of the structure described it will

85 be noted that provision is made for operating the entire device from the axle of the car and storing any excess energy within the storage battery, utilizing this energy to supply fresh

90 air under pressure, which may be filtered and supplied to the car while the car is at rest, and further utilizing the energy derived from the car-axle to light and cool the car, the cooling medium being mechanically driven when

95 desired.

The apparatus is shown and primarily designed for use with cars or other vehicles, but it will be evident that it is equally applicable for ventilation in other situations, as tunnels, subways, or the like.

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While I have shown a means for storing excess power of the dynamo in a storage battery for utilization in operating the parts while the car is at rest, it is equally obvious that such excess power may be utilized to the

105 exclusion of the dynamo in operating an air-pump to store air under pressure in any suitable receptacle, said storage-pressure being utilized to operate the parts while the car is at rest.

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Having thus described the invention, what is claimed as new is—

1. A car-ventilating apparatus comprising a filtering-chamber open to the atmosphere, a perforated foul-air outlet-pipe arranged

115 within the car, a pump within the car and in communication at one end with said outlet-pipe, said pump having an outlet to the atmosphere adjacent the communication with the outlet-pipe, the opposite end of the pump

120 having an air-inlet and being in communication with the filtering-chamber, and means for operating the pump.

2. A filtering-chamber fixed within a car-body and open to the atmosphere, a perforated foul-air pipe arranged within the car, a pump having communication with said perforated pipe and formed with an outlet to the atmosphere, the opposite end of the pump

125 being formed with an air-inlet, and a pipe in

130



communication with the pump at the inlet end and with the filtering-chamber.

3. A filtering-chamber mounted within the car-body and normally open to the atmosphere beyond the car-body, a perforated foul-air pipe mounted within the car, a pump fixed within the car and in communication at opposite ends with the perforated pipe and with the filtering-chamber, an air-outlet leading from the pump at the end adjacent the communication with the perforated pipe, and an air-inlet leading to the pump at the end adjacent the communication with the filtering-chamber.

4. A filtering-chamber mounted in the tank-body and normally open to the atmosphere, a filtering medium within the cham-

ber, a liquid-tank in communication with the chamber for supplying moisture to the filtering medium, a perforated foul-air pipe mounted within the car, a pump fixed within the car and in communication at opposite ends with the perforated pipe and with the filtering-chamber, an air-outlet leading from the pump at the end adjacent the communication with the perforated pipe, and an air-inlet leading to the pump at the end adjacent the communication with the filtering-chamber.

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

FREDERICK W. SYMMES.

Witnesses:

DAVID W. GOULD,  
JOHN L. FLETCHER.