

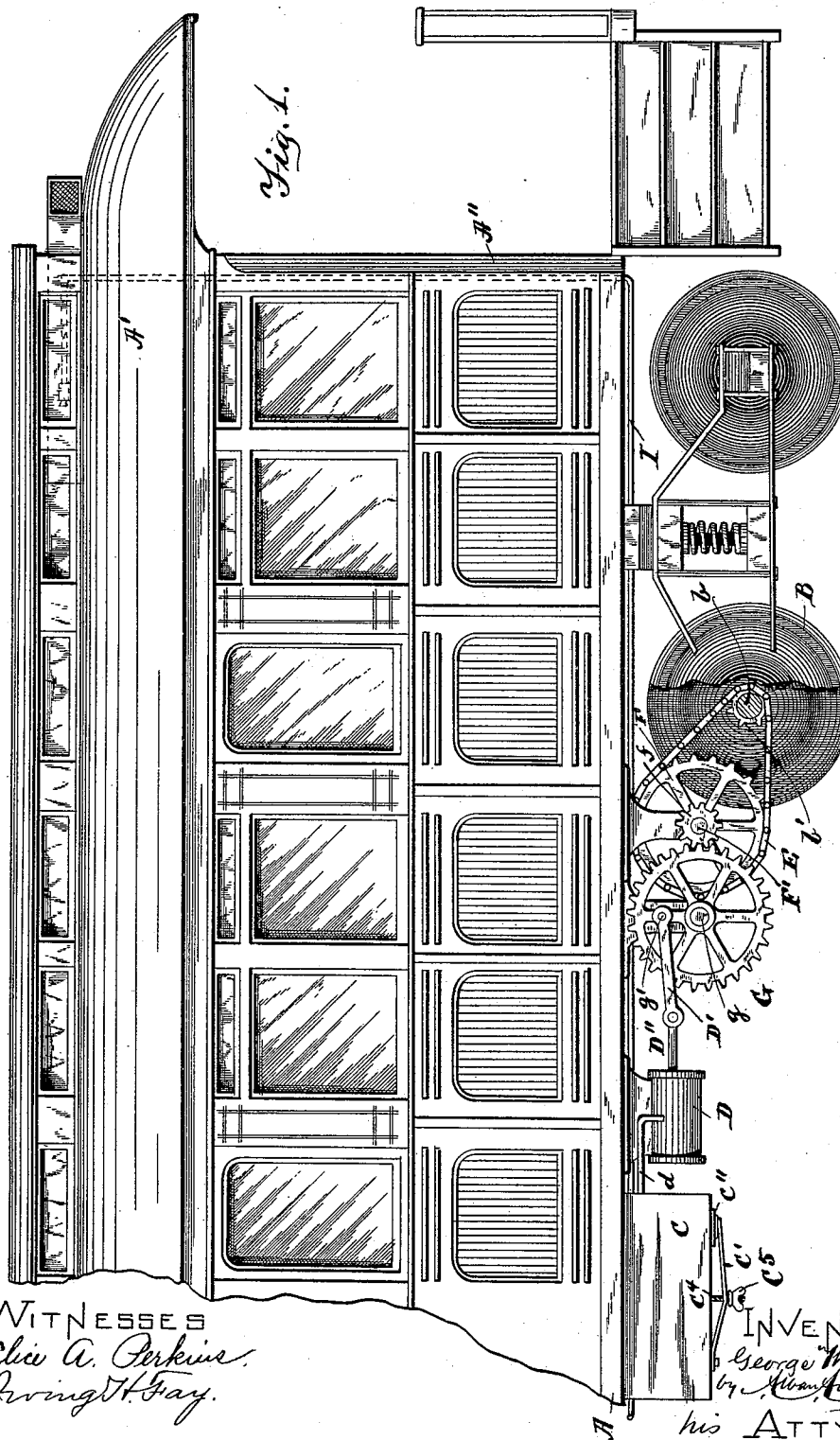
(No Model.)

2 Sheets—Sheet 1.

G. W. LORD.
AIR FORCING DEVICE.

No. 465,326.

Patented Dec. 15, 1891.



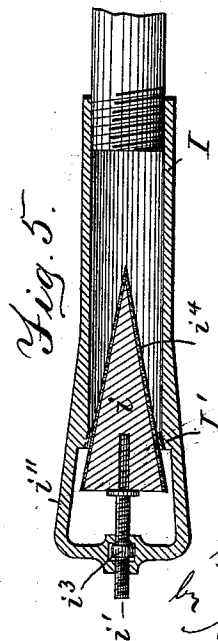
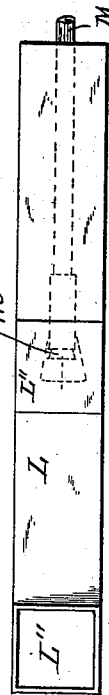
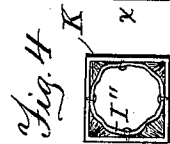
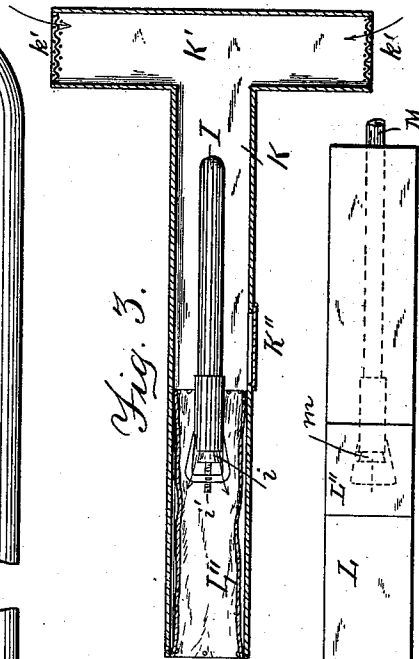
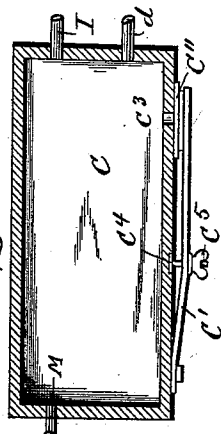
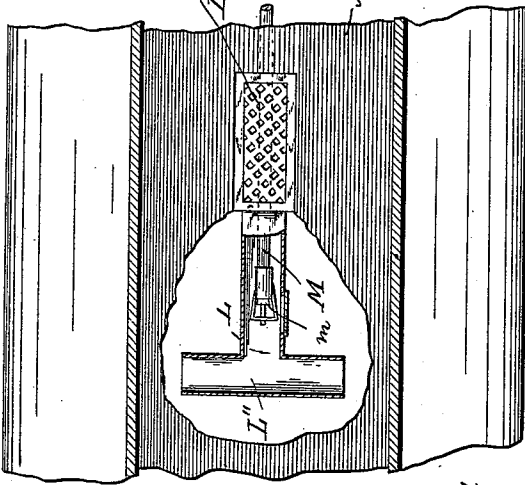
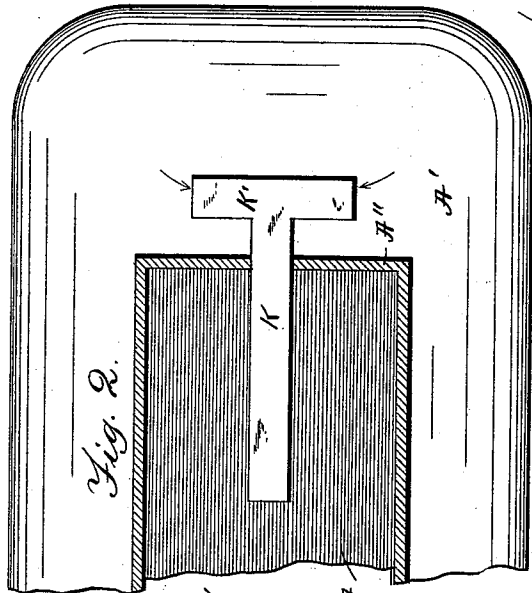
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2 Sheets—Sheet 2.

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WITNESSES
Alice A. Perkins.
J. Wright Fay.

Fig. 6.

Fig. 5.

Fig. 3.

Fig. 4.

Fig. 7.

INVENTOR
George W. Lord
by Wm. Andrew
his ATTY

UNITED STATES PATENT OFFICE.

GEORGE W. LORD, OF BOSTON, MASSACHUSETTS.

AIR-FORCING DEVICE.

SPECIFICATION forming part of Letters Patent No. 465,326, dated December 15, 1891.

Application filed April 3, 1891. Serial No. 387,540. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. LORD, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Air-Forcing Devices, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improvements in air-forcing devices particularly designed for the proper ventilation of railroad-cars, although it may to equal advantage be used for the ventilation of public and private buildings, halls, school-houses, &c.

The object of the present invention is to provide a novel noiseless injector, by means of which air can be forced into and out of a compartment without producing an unpleasant hissing noise.

To accomplish this object my invention involves the features of construction and the combination or arrangement of devices hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 represents a side elevation of a railroad-car provided with my invention, partly shown in section. Fig. 2 represents a plan of the car, showing its roof removed. Fig. 3 represents an enlarged horizontal section of the injector-pipe. Fig. 4 represents an end view of said injector-pipe as seen from X in Fig. 3. Fig. 5 represents a longitudinal section of the air-forcing pipe, and Fig. 6 represents an enlarged vertical section of the air box or chamber. Fig. 7 represents a detail side view of the foul-air-delivery pipe.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

A in Fig. 1 represents the floor of a railroad-car, A' its roof, and A'' one of its ends, as usual.

b is the axle of one of the truck-wheels constructed in the ordinary manner.

C is an air box or receiver preferably located below the floor of the car, and into such box the air is forced by means of a suitable air-pump or air-forcer D, having a pipe d leading from it to the box C, as shown in Fig. 1. The pump or air-forcer may be positively op-

erated by mechanism from one of the wheel-axles, as shown in Fig. 1, in which I have shown a chain-wheel b', secured to the car-axle b, from which an endless chain E conveys the rotary motion to a chain-wheel F, secured to a shaft F', located in bearings preferably secured to the bottom of the car. To said shaft F' is secured a pinion f, the teeth of which mesh in the teeth of the gear-wheel G, secured to the shaft g, which is located in bearings also preferably secured to the bottom of the car. The gear G has a crank-pin g', to which one end of the connecting-rod D' is pivoted, said rod being pivoted in its other end to the piston-rod E'' of the pump or air-forcer D, as shown in Fig. 1.

I wish to state that I do not desire to confine myself to this precise mechanism for actuating the air forcer or pump, as this may be done in any other manner, according to circumstances, without departing from the essence of my invention.

The air-box C is provided with an automatic escape-valve for the purpose of allowing part of the air under pressure in the said box to escape if from any cause the air-pressure in it should exceed the normal desired one. In Fig. 6 I have shown one form of a safety-valve for this purpose, consisting of a spring C', secured at one end to the box C and having a valve C'' at its free end adapted to close a perforation C³ in the wall of the box C. By means of a regulating-screw C⁴ and nuts C⁵ the tension of the spring C' may be adjusted relative to the air-pressure in the box C, as is common in air-pressure devices. From the air-box C leads a pipe I to the injector-pipe K, through which the outer fresh air is forced into the upper portion of the car or apartment, as shown in Fig. 1. The pipe K extends outside of the car as a transverse or T-head K', the ends of which are covered with gauze or wire-netting k' k', as shown in Fig. 3, so as to prevent dust, cinders, &c., from passing through said pipe K into the car or apartment. The air-pipe I terminates within the injector-pipe K as a flaring mouth I', within which is adjustably secured a tapering plug i, covered with cloth, plush, or suitable textile or fibrous material i' for the purpose of forming a wall which deadens the noise of

the escaping air from the mouth I' as it passes into the delivery end of the injector-pipe K, which latter is lined on its interior with a loose flexible lining of cloth I'', which
 5 extends from the delivery end of said pipe K to a place just back of the flaring mouth I' of the air-pipe I, as shown in Fig. 3. As shown in Fig. 4, the air-delivery pipe K is square in cross-section and the tubular flexible cloth
 10 lining is so attached to the sides of the pipe that such lining is left loose and shaking, as it were, at the corners of the pipe for the purpose of causing the air to pass out without noise. The plug *i* has attached to its
 15 outer end a screw-rod *i'*, which passes loosely through a bail *i''*, secured to the end of the pipe I, and the said plug is longitudinally adjusted by means of a nut *i'''*, as shown in Fig. 5. By this arrangement the outer pure
 20 air will be delivered free from dust, cinders, &c., in a noiseless manner to the interior of the car or apartment.

For the purpose of withdrawing the foul air from the car I connect to the lower part
 25 of the car a delivery-pipe L, having a register or grating L' where it connects with the car, and having, preferably, a T-head L'' with lateral delivery ends, as shown in Fig. 2. Within the pipe L is arranged an air-forcing
 30 pipe M, leading from the air-pressure box C, for the purpose of creating a vacuum in said pipe L, and thus forcing out the foul air from within the car. The mouth of the air-forcing
 35 pipe M is provided with an adjustable plug *m*, of the same kind as used in the pipe K, so as to regulate the flow of the air into the pipe L. On the pipes K and L, I make the
 40 respective slides or doors K'' L'', which may be opened whenever it is desired to adjust the positions of the tapering plugs *i m* relative to the delivery-mouths of the respective
 pipes I and M.

By the arrangement as herein described a proper amount of pure air is forced into the
 45 car or room in a noiseless manner and the foul air ejected on reaching the lower portion of the car or room, substantially as hereinabove described.

Having thus fully described the nature, construction, and operation of my invention, I
 50 wish to secure by Letters Patent and claim—

1. In a ventilating apparatus, the combination, with an air-forcing mechanism, of an air-delivery pipe and an air-conducting pipe extending into the air-delivery pipe and having
 55 a soft flexible wall at its discharge-mouth for deadening the noise of the air discharging into the air-delivery pipe, substantially as described.

60 2. In a ventilating apparatus, the combination, with an air-forcing mechanism, of an air-

delivery pipe containing an internal flexible lining attached at different points to leave the remaining portions loose, and an air-conducting pipe having a flaring air-discharge mouth
 65 and a soft flexible wall in such mouth for deadening the noise of the air discharging into the air-delivery pipe, substantially as described.

3. In a ventilating apparatus, the combination, with an air-forcing apparatus, of an air-delivery pipe containing an internal flexible
 70 lining, an air-conducting pipe having a flaring air-discharge mouth located in a flexible lining of the air-delivery pipe, and a cone provided with a soft flexible covering and arranged in the flaring air-discharge mouth for
 75 deadening the noise of the air discharging into the air-delivery pipe, substantially as described.

4. In a ventilating apparatus, the combination, with an air-forcing mechanism, of an air-delivery pipe containing an internal flexible
 80 lining, an air-conducting pipe having a flaring air-discharge mouth located in the flexible
 85 lining, a bail on the air-conducting pipe, and a cone supported by the bail and having a soft flexible covering arranged in the flaring air-discharge mouth for deadening the noise
 90 of the air discharging into the air-delivery pipe, substantially as described.

5. In a ventilating apparatus, the combination, with an air-forcer D, of an air-receiving box C, connected with the air-forcer and provided with a perforation C³, a spring C', se-
 95 cured to the box and provided with a valve C'' for closing the perforation, a set-screw for varying the power of the spring, and means for delivering the air from the air-receiving
 100 box into the compartment to be ventilated, substantially as described.

6. In a ventilating apparatus, the combination, with an air-forcer D, of an air-receiving box C, connected with the air-forcer and provided with a perforation C³, a spring C', se-
 105 cured to the box and provided with a valve C'' for closing the perforation, an injector-pipe having a flexible lining at its delivery-mouth for forcing the pure air noiselessly into the
 110 compartment to be ventilated, a secondary pipe leading from the air-receiving box, and a foul-air-delivery pipe leading from the compartment and connected with the secondary pipe, substantially as described.

In testimony whereof I have signed my
 115 name to this specification, in the presence of two subscribing witnesses, on this 30th day of March, A. D. 1891.

GEORGE W. LORD.

Witnesses:

ALBAN ANDRÉN.

ALICE A. PERKINS.