(No Model.)

C. F. HIRT.

CAR VENTILATING APPARATUS.

No. 542,018. Patented July 2, 1895.

Fig. 1.

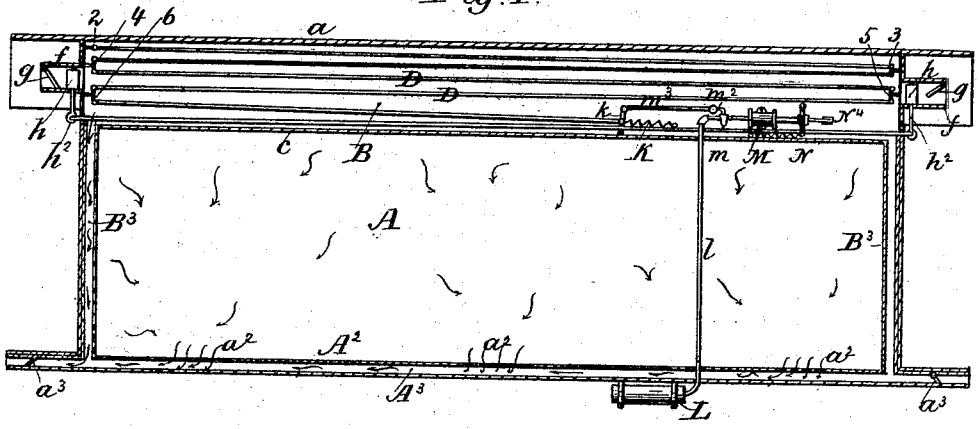


Fig. 2.

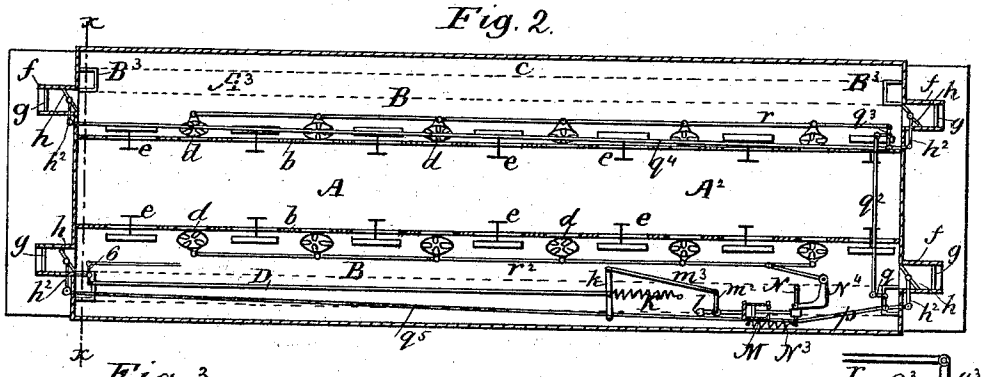


Fig. 3.

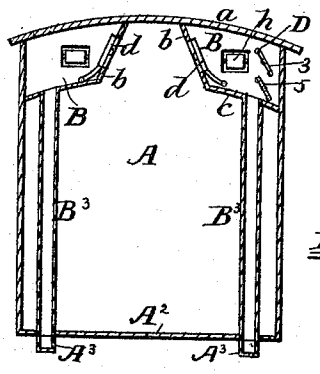


Fig. 4.

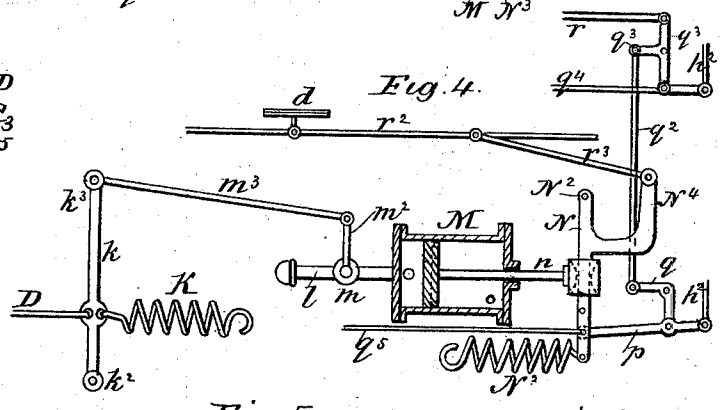


Fig. 5.

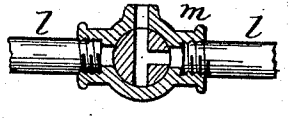
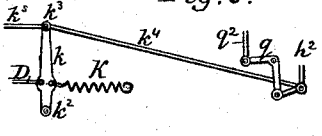


Fig. 6.



WITNESSES

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CAR-VENTILATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 542,018, dated July 2, 1895.

Application filed November 2, 1894. Serial No. 527,739. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. HIRT, a citizen of the United States, residing at Erie, in the county of Erie, State of Pennsylvania, have invented certain new and useful Improvements in Car-Ventilating Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to devices for automatically opening the ventilating-registers in the upper portion of cars when the temperature therein exceeds the degree desired; and the objects of this invention are to provide, in connection with a series of stretched wires having their ends united together and located under the roof of the car, simple and inexpensive means for opening the air valves and registers of the car, the closing of the valves and registers being accomplished mainly by the contraction of said wires. I attain these objects by the construction illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section of a car provided with means for operating the air valves and registers in accordance with my invention. Fig. 2 is a horizontal section of the same, taken between the roof and ceiling of the car, and showing the features of my invention. Fig. 3 is a transverse vertical section taken on line *x x* of Fig. 2, adjacent to one end of a car provided with valve and register operating devices in accordance with my invention. Fig. 4 represents in plan view on a large scale the main portion of the operating devices of the invention. Fig. 5 is a horizontal section of the three-way cock of the apparatus. Fig. 6 is a diagram showing a modification in which the air-cylinder is dispensed with.

In said drawings, A represents the body of the car, having two air-chambers B lengthwise thereof between the roof *a* and ceiling *c* thereof, the central portion extending up to the roof between the partitions *b*, forming the inner sides of the chamber B, in which partitions are located a series of openings closed by automatically-controlled registers *d* located preferably between the ordinary hand-operated registers *e*, that are under the control of the brakeman or other trainman of the railway. In each end of each air-chamber B there is a short rectangular funnel *f*, projecting preferably under the front and rear hoods of the roof, and within each funnel are placed two valves. The outer valve *g* is a flap-valve pivoted from its upper edge, and when closed it is in a slightly-inclined position, with its lower edge toward the interior and resting upon the bottom of the funnel *f*. The inner valve *h* is rotary, being mounted on pivots projecting centrally from its sides, one of said pivots having a stem h^2 in the form of a crank projecting from the side of the funnel *f* and by which it can be operated.

When the temperature within the car or within the air-chamber B is warmer than generally desired, the valves *h* are swung in a horizontal position automatically by certain means that will be hereinafter described and constitute my invention. The car being supposed to be in motion, a current of air will enter through the front funnels *f* into the air-chambers B and thence through the openings in the registers *d* into the interior of the car and escape therefrom through small perforations a^2 in the floor A^2 into horizontal flues A^3, placed under said floor lengthwise thereof. Each flue A^3 has therein adjacent to each end a flap-valve a^3, pivoted from its upper edge, and when closed it is in a slightly-inclined position, with its lower edge toward the outer end of the flue A^3 and resting upon the bottom of said flue.

To relieve the air-chambers B from abnormal air-pressure if the registers on the sides of said chambers are nearly closed, said chambers are provided at each end with downwardly-extended flues B^3, that have their lower ends in communication with the bottom flues A^3.

To automatically control the induction-valves *h* and the registers *d*, (and to take the place of a very long single wire,) a series of wire is stretched in each chamber B lengthwise thereof. One end of the wire is, for example, secured at 2 to one end of the end walls of said chamber and the opposite end to one arm of a centrally-pivoted short lever 3, the pivot of which is secured to the opposite end wall of the chamber B. To the opposite arm of the lever 3 is secured another wire D, that is retained stretched by having its opposite end secured to one arm of a centrally-piv-

oted short lever 4, the pivot of which is secured to the opposite end wall of the chamber B. To the opposite end of the lever 4 is secured another wire D, that is retained stretched by having its opposite end secured to one arm of a centrally-pivoted short lever 5, the pivot of which is secured to the opposite end wall of the chamber B. To the opposite end of the lever 5 is secured another wire D, that is retained stretched by having its opposite end secured to one arm of a vertically-pivoted short lever 6, the pivot of which is secured to the opposite end wall of the chamber B. To the opposite end of the lever 6 is secured another wire D, that is retained stretched by having its opposite end secured to the central portion of a longer lever k, through the medium of a strong coiled spring K, having one end secured to said central portion of the lever k and the other end to the frame of the car. Said lever k has one end k^2 pivoted to the frame of the car and its opposite end k^3 can be connected directly by means of a rod k^4 (shown in the diagram represented in Fig. 6) with the valve-stem h^2 of the end valves h located at one end of the car and with the end valves at the opposite end by the rod k^5, having one end attached to the free end of the lever k, if the spring K is made powerful enough to operate all the end valves and the registers on both sides of the car; but I prefer to use auxiliary means to help the spring K to accomplish this operation. This consists in the employment of some of the power stored in the air-reservoir or "train service-pipe" L of the air-brake now used upon nearly all passenger-cars.

Air under pressure is conducted from the "train-service pipe" L through a pipe l, that has a horizontal branch within one of the air-chambers B to an air-cylinder M located preferably also in said air-chamber; but to control the admission of air under pressure to said cylinder and its subsequent issue therefrom a three-way cock m is placed upon said pipe l. The plug of said cock has a handle m^2 extended on one side thereof that is pivotally connected with one end of a connecting-rod m^3, the opposite end of which is pivotally connected with the free end of the lever k. Within the cylinder is placed a piston, the rod n of which is pivotally connected with the middle portion of a lever N either by means of a tubular head on the end of said rod or by suitable links. The lever N has one end pivoted at N^2 to the frame of the car, while the opposite end is normally retracted toward the cylinder M by a spring N^3, that has one end secured to the free end of the lever N and the opposite end to the frame of the car. Adjacent to said free end the lever N has also pivoted thereto one end of a rod p, the opposite end of which is pivotally connected with the crank-stem h^2 of the valve h on one side of the car. To operate the valves h on the opposite side of the car, a bell-crank lever q, pivoted to the frame of the car, has one end pivoted to the rod p, while the opposite end has pivoted thereto a connecting-rod q^2, that extends across the top of the car and has connected thereto one arm of a T-lever q^3. Said lever is pivoted about the middle of its length to the frame of the car and has one arm connected by means of a link with the stem h^2 of the air-valve on the opposite side of the car. To said arm of said lever q^3 is also pivotally united a rod q^4, that operates the valve h at the opposite end of the car. To the opposite arm of the T-lever q^3 there is pivotally connected a rod r to which the stem of each air-register d on one side of the car is attached, preferably pivotally. It has been described how the lever N, by means of the rod p, operates the air-valve h^2 at one end of the car. To said lever N there is also pivotally attached a rod q^5, that has its opposite end connected with the air-valve h^2 at the opposite end of the car. To reciprocate the register-rod r^2 on the side of the car occupied by the cylinder M, the lever N is also provided with an angular arm N^4, adjacent to its pivotal end N^2, to which said rod r^2 is united by means of a connecting-rod r^3, as shown in Figs. 2 and 4.

The three-way cock m not only permits air under pressure to be admitted to the cylinder M when the wires D are expanded by heat and the spring K is free to pull the lever k laterally, but when the temperature has become cooler and the wires in contracting overcome the tension of the spring K the plug of said cock again occupies the position shown in Fig. 5, the air in the cylinder is allowed to escape through said cock and the piston resumes its position, as in Fig. 4, under the action of the spring N^3 upon the piston-rod.

Having now fully described my invention, I claim—

1. In combination with the body of a car having air chambers in its top and flues in the ends of said chambers, valves h in said flues, a series of wires D, pivoted levers uniting them, a spring retaining said wires under tension, and rods and levers uniting them with the valves h substantially as described.

2. The combination of the body of a car having an air chamber in its top and flues in the ends of said chamber, valves g and h in said flues, a series of wires D, pivoted levers uniting them, a spring retaining said wires under tension and rods and levers uniting them to the valves h substantially as described.

3. The combination of the body of a car having air chambers in its top and flues in the ends of said chambers, valves h in said flues, air registers in the side walls of said chambers, a series of wires D, pivoted levers uniting them, a spring retaining said wires under tension and rods and levers uniting said wires D with the valves h and with the air registers substantially as described.

4. The combination of the body of a car having air chambers in its top, vertical flues B^3 from the ends of said chambers horizontal flues A^3 under the floor of the car and receiv-

ing the lower ends of the flues B^3, air flues *f* in the ends of the air chambers, valves *h* in said air flues *f*, a series of wires D in the air chamber, pivoted levers uniting said wires, a spring retaining said wires under tension, and rods and levers uniting the wires D with the valves *h* substantially as described.

5. The combination of the body of a car having air chambers in its top and flues in the ends of said chambers, valves *h* in said flues, a series of wires D, pivoted levers uniting them, a spring retaining said wires under tension, a pivoted lever *k* connected with the terminal wire of the series and with said spring, said lever being connected with one of said valves *h* substantially as described.

6. The combination of the body of a car having air chambers in its top and flues in the ends of said chambers, valves *h* in said flues, a series of wires D connected together, a spring retaining said wires under tension, a pivoted lever *k* connected with the terminal wire of the series and with said spring, a pipe leading air under pressure from the "train service pipe" into an air cylinder M, a cock upon said pipe, a connecting rod uniting the handle of said cock with the lever *k*, the piston and piston rod of said cylinder, and means for connecting said piston rod with the valves *h* substantially as described.

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

CHARLES F. HIRT.

Witnesses:
GEO. B. DEVOE,
C. A. HART.