

No. 634,702.

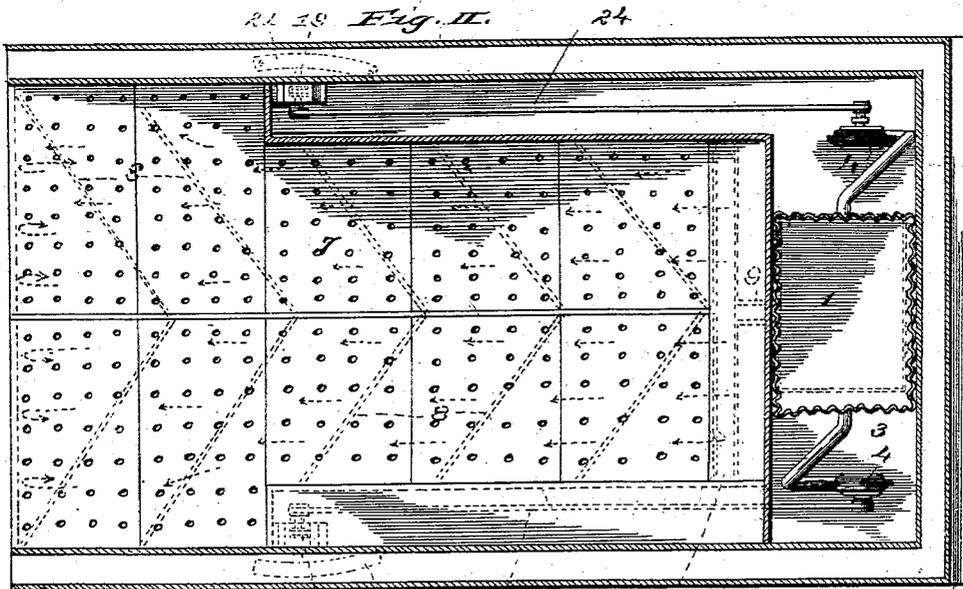
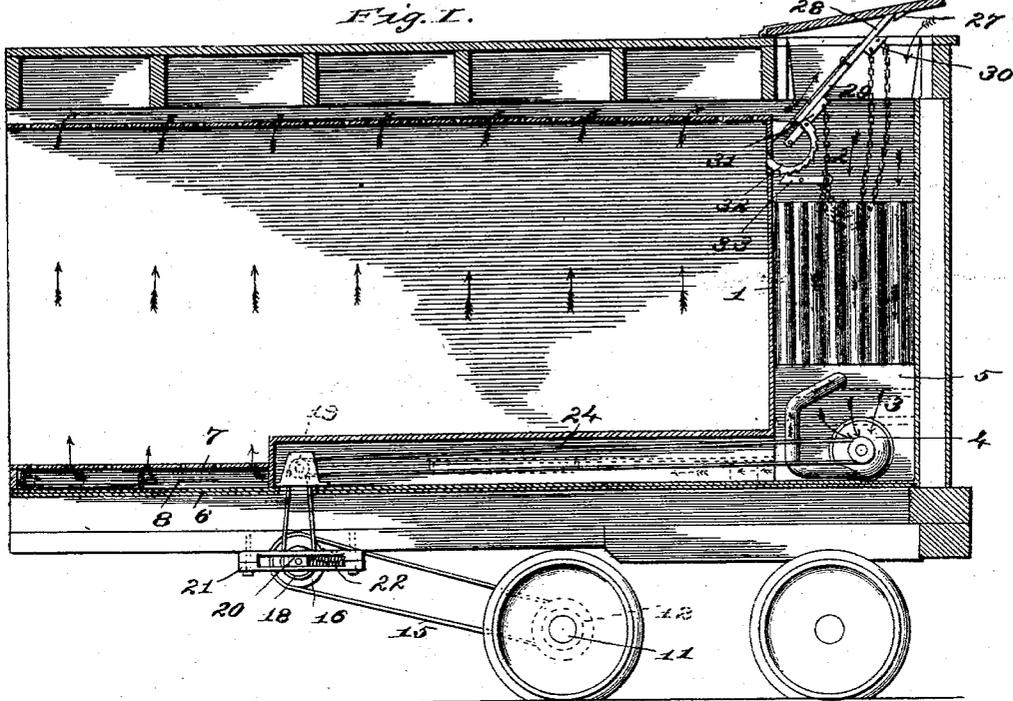
Patented Oct. 10, 1899.

W. J. SHAW.
REFRIGERATOR CAR.

(Application filed Apr. 13, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

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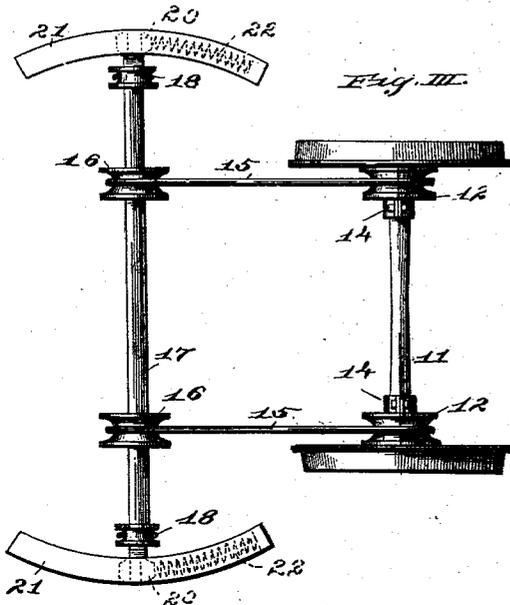


Fig. III.

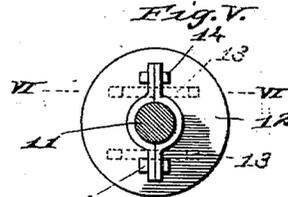


Fig. V.

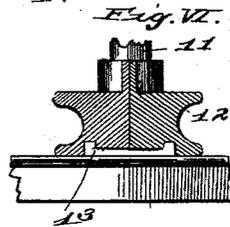


Fig. VI.

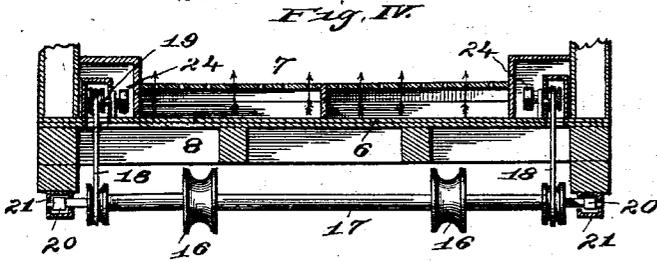


Fig. IV.

Fig. VII.

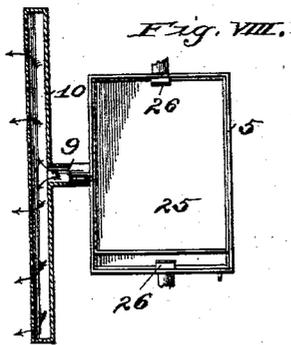
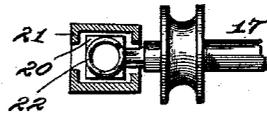


Fig. VIII.

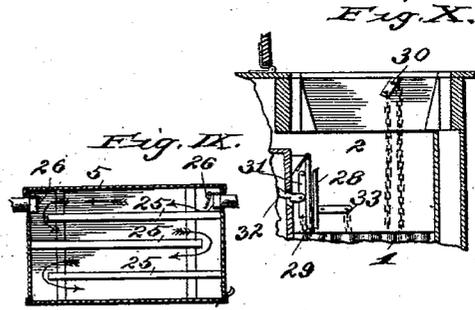


Fig. IX.

WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM J. SHAW, OF ST. LOUIS, MISSOURI.

REFRIGERATOR-CAR.

SPECIFICATION forming part of Letters Patent No. 634,702, dated October 10, 1899.

Application filed April 13, 1899. Serial No. 712,884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. SHAW, a citizen of the United States of America, and a resident of the city of St. Louis and State of Missouri, have invented a new and useful Refrigerator-Car, of which the following is a specification.

My invention relates to refrigerator-cars, and has for its principal object to maintain a proper circulation of air while the car is in motion.

To this end it consists principally in improved arrangements in the system of circulation and ventilation.

It also consists in a tension-equalizing device located in the mechanism for transmitting the motion of the car-axle to the fan.

It also consists in the parts and in the arrangements and combinations of parts hereinafter described and claimed.

In the accompanying drawings, which form part of this specification, and wherein like symbols refer to like parts wherever they occur, Figure I is a longitudinal vertical section of one-half of a car. Fig. II is a horizontal section thereof. Fig. III is a detail of the tension-equalizing shaft connected to the car-axle. Fig. IV is a transverse section of the bottom of the car, showing the tension-equalizing shaft connected thereto. Figs. V and VI are detail views of the pulleys mounted on the car-axle. Fig. VII is a detail of the bearing of the tension-equalizing shaft. Fig. VIII is a horizontal detail of the drying-chamber and the air-distributing-head. Fig. IX is a vertical cross-section of the air-drying chamber, and Fig. X is a detail of the ventilating device above the ice-box.

At each end of the car is an ice-box 1, whose sides are preferably made of sheet metal corrugated to secure rigidity, to increase the surface thereof, and to form flues for the air. The other parts of such flues are formed by the sides or ends of the car or by separate plates arranged close to the ice-box. These flues communicate above with a chamber open to the outer air or to the upper interior part of the car, as may be desired, and below they open into a chamber in which is a fan or blower 4. The outlet-flue of the fan opens into a drying-chamber 5, located, preferably, below the ice-box, and this drying-chamber communicates

with a space between the true bottom 6 of the car and a perforated false bottom 7, arranged above the true bottom. When the fan is in motion, the air is sucked from the space above the ice-box down through the metal flues into the fan-chamber, from which it is forced through the drying-chamber and under the false bottom, whence it rises through the body of the car and either escapes from the car through ventilators provided therefor or else it passes back into the space above the ice-box. The air is thus cooled, dried, and circulated.

In order to distribute the incoming air throughout the car, the true bottom is provided with a series of rifle-bars or deflector-plates extending upwardly therefrom and arranged to practically obstruct the draft, and thereby deflect the air up through the false bottom. Beginning at the end of the car each bar extends higher than the one preceding it, until at the middle of the car the space between the false and the true bottom is practically closed. The deflector bars or plates terminate near the medial longitudinal line of the car and are arranged at an inclination so as to present an obtuse angle to the draft, and thereby deflect the air toward the sides of the car. By this arrangement the air is distributed with some degree of uniformity to all parts of the car. In order to facilitate such distribution, the outlet-pipe from the drying-chamber is connected to a distributing-head 10, extending across the car under the false bottom and having holes in its sides for the escape of the air into the space beneath the false bottom.

The fan or blower is driven by the car-axle as follows: The car-axle is provided with a split pulley fixed thereon. At one end the two parts of the pulley are held together by hooked straps 13, countersunk in the ends of said parts, whereby said pulley can be jammed close against the car-wheel. At the other end said parts are provided with projecting flanges, through which bolts 14 clamp them firmly together. The driving-belt 15 on the axle-pulley passes over a pulley 16 on a tension-equalizing shaft 17, movably mounted on the under side of the body of the car. Another belt 18 transmits the power from the equalizing-shaft 17 to a counter-shaft 19,

mounted inside of the car, and from this counter-shaft the shaft of the fan 4 is driven by means of an ordinary belt.

The journal-boxes 20 of the equalizing-shaft are not fixed, but are arranged to slide in slotted frames or channel-bars 21, secured to the car sill or body and curved in a practically circular arc, whose center is the middle of the equalizing-shaft. In each of the frames is a compression-spring 22, arranged to bear against the journal-box, and thereby maintain a proper degree of tension on the belt connected to the car-axle. When the car rounds a curve, however, and the position of the axle relative to the car-body changes, the springs automatically yield or expand to relieve the belt from excessive tension or to take up the slack, according as the change of position may require. As the counter-shaft is above the tension-shaft in a line practically perpendicular to the direction of motion of the tension-shaft, the latter may have a considerable range of movement without materially changing the distance between it and the counter-shaft. The necessary elongation of the belt between said shafts may be provided for by using an extensible belt. Thus the tension-equalizing shaft accommodates itself to the varying positions of the car-axle without affecting the continuous transmission of motion to the fan.

In practice each end of the car is preferably furnished with two fans arranged, respectively, to be driven by the car-axle according as the car is moving in one direction or the opposite. These fans are located on opposite sides of the drying-chamber and are connected to separate counter-shafts, but using the same equalizing tension-bar. The belts 24 inside of the car are properly boxed in and the counter-shafts are inclosed airtight to prevent the admission of dust.

The drying-chamber is preferably located directly below the ice-box and contains a series of pans or shelves 25, containing chlorid of calcium arranged in vertical series. These shelves or pans extend horizontally across the chamber except for a short space left at alternate ends thereof, whereby a long tortuous passage is formed through the chamber and the air passing therethrough is exposed to a large surface of the chlorid. The openings from the respective fans or blowers are located over the top of the drying-chamber and are covered by hanging shelves 26, which close automatically when the draft through them ceases. The pans are preferably removable. So, likewise, the false bottom of the car is made in sections in order to be removable.

A convenient arrangement for ventilating the car is shown in Fig. I. In this construction the door 27 in the roof of the car above the ice-box is held partly open by means of a folding prop, which also serves to deflect the exhaust-draft to the outside. This prop consists of two or more plates or boards 28 29,

hinged together, and the lower one, 29, also hinged to the framework below the air-flue in the top of the car, such a flue being formed by a perforated false ceiling arranged slightly below the roof of the car. In the open position the upper plate 28 rests against a block 30, provided therefor at the side of the hole in the roof. Below the lower plate is pivoted or hinged a third plate 31, which is provided with a curved ratchet-bar 32, and a pawl 33 is arranged on the framework to engage this ratchet. The pawl and the plate to which the ratchet is attached are both provided with chains for manipulating them. The operation of this apparatus is as follows: In the position shown in the drawings fresh air is sucked in through the top of the car, circulated through the car, and when it gets back to the space above the ice-box is deflected into the open air by means of the plates which prop up the door. When these plates are folded, the door is closed and the air again circulates, as before. As shown in Fig. X, the plates in their folded position are suspended vertically beneath an overhanging shoulder, whereby they are protected from the ice as it drops into said box, and do not obstruct the draft. To raise these plates, the third plate is raised by its chain to the proper height, carrying the others with it, and then the upper prop-plate is unfolded by hand. In lowering these plates the ratchet is released from the pawl by manipulating its chain, and at the same time the plates are lowered by the other chain.

What I claim is—

1. A ventilated car comprising a perforated false bottom arranged above the true bottom, a distributing-head extending across said car under said false bottom and having perforations opening into the space beneath said false bottom, a closed fan-chamber communicating with said distributing-head and having an opening near the top of the car, and a fan in said chamber, substantially as described.

2. A ventilated car comprising a true bottom having raffle-bars thereon and a perforated false bottom arranged above the true bottom, a perforated distributing-head extending across said car and communicating with the space between said bottoms, a closed fan-chamber in the end of the car and communicating with said distributing-head and having an opening near the top of the car, and a fan in said chamber, substantially as described.

3. A ventilated car comprising a true bottom having raffle-bars therein, said raffle-bars being arranged in a series of successively-increasing height away from the fan-chamber, a perforated false bottom arranged above the true bottom, a fan-chamber in the end of the car and communicating with the space between said bottoms and having an opening near the top of the car, and a fan in said chamber, substantially as described.

4. A ventilated car comprising a perforated false bottom arranged above the true bottom, a perforated false ceiling arranged below the roof of the car, a fan-chamber communicating with the space beneath said false bottom and with the space above the false ceiling and a device for cutting off the communication between the space beneath the roof and the fan-chamber and opening said space and said chamber to the outer air, and a fan in said chamber, substantially as described.

5. A ventilated car comprising a perforated false bottom arranged above the true bottom, a perforated false ceiling arranged below the roof of the car, a fan-chamber communicating with the outlet air flue or space beneath said false bottom and with the space above the false ceiling, and a fan in said chamber, a hatch-door in the roof and a folding deflector-prop therefor, said prop consisting of broad plates hinged together below the outlet-flue formed by the space above the false ceiling, whereby said prop constitutes a deflector for the incoming and the outgoing air, substantially as described.

6. A ventilated car comprising a perforated false bottom arranged above the true bottom, a perforated false ceiling arranged below the roof of the car, a fan-chamber communicating with the spaces below the false bottom and above the false ceiling respectively, a hatch-door hinged at one end to the roof of the car, and a prop therefor consisting of a board hinged on one side to the frame of the car below the flue formed between the roof and the false ceiling and hinged on the opposite side to a second board, whereby said prop constitutes a deflector for the incoming and the outgoing air, substantially as described.

7. A ventilated car comprising a perforated false bottom arranged above the true bottom, a drying-chamber communicating with the space between said bottoms, fan-chambers

each having an opening near the top of the car and communicating with said drying-chamber, an automatically-acting valve in the connection between each of said fan-chambers and the drying-chamber, and a fan in each of said fan-chambers, said fans being connected to the car-axle and geared to run in opposite directions, substantially as described.

8. A ventilated car comprising a perforated false bottom arranged above the true bottom, a drying-chamber communicating with the space between said bottoms, a fan-chamber having an opening near the top of the car and communicating with said drying-chamber, an ice-box having spaces at its sides constituting flues of the fan-chamber, and a fan in said chamber, substantially as described.

9. In a ventilated car, a ventilating device consisting of a hatch-door hinged to the roof of the car and a folding deflector-prop therefor consisting of a plate hinged to the frame of the car and having a second plate hinged to its opposite side, a third plate pivotally mounted below said first-mentioned plate and having means for manipulating the same and having also a curved ratchet-bar, and a pawl mounted on the frame to cooperate with said ratchet-bar, and means for manipulating the same, substantially as described.

10. In a ventilated car having an outlet-flue, a ventilating device consisting of a hatch-door hinged to the roof of the car, and a folding deflector-prop therefor consisting of a board hinged on one side to the frame of the car below said outlet-flue and a second board hinged to the first, whereby said prop deflects both the incoming and the outgoing air, substantially as described.

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Witnesses:

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WILLIAM P. CARR.