

S. Darling.

Car Heater.

N^o 79,449.

Patented Jan. 30, 1868.

Fig. 1.

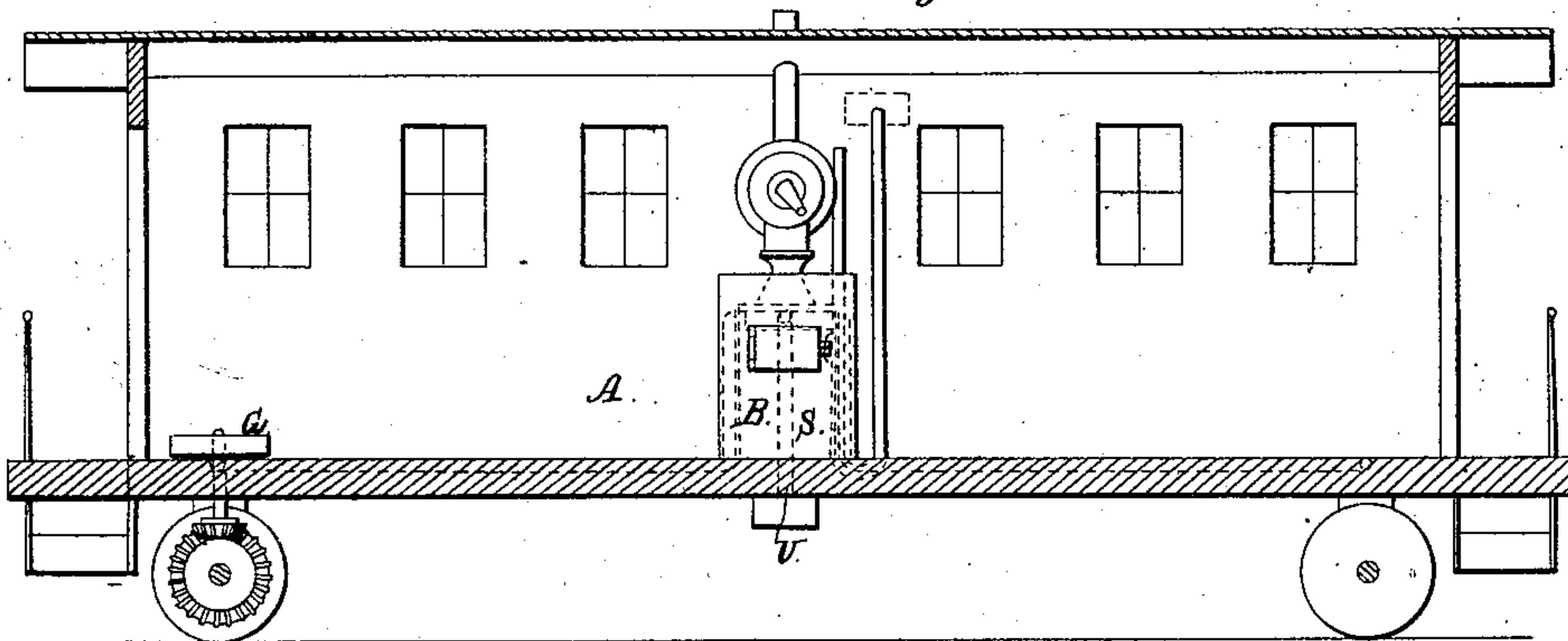


Fig. 2.

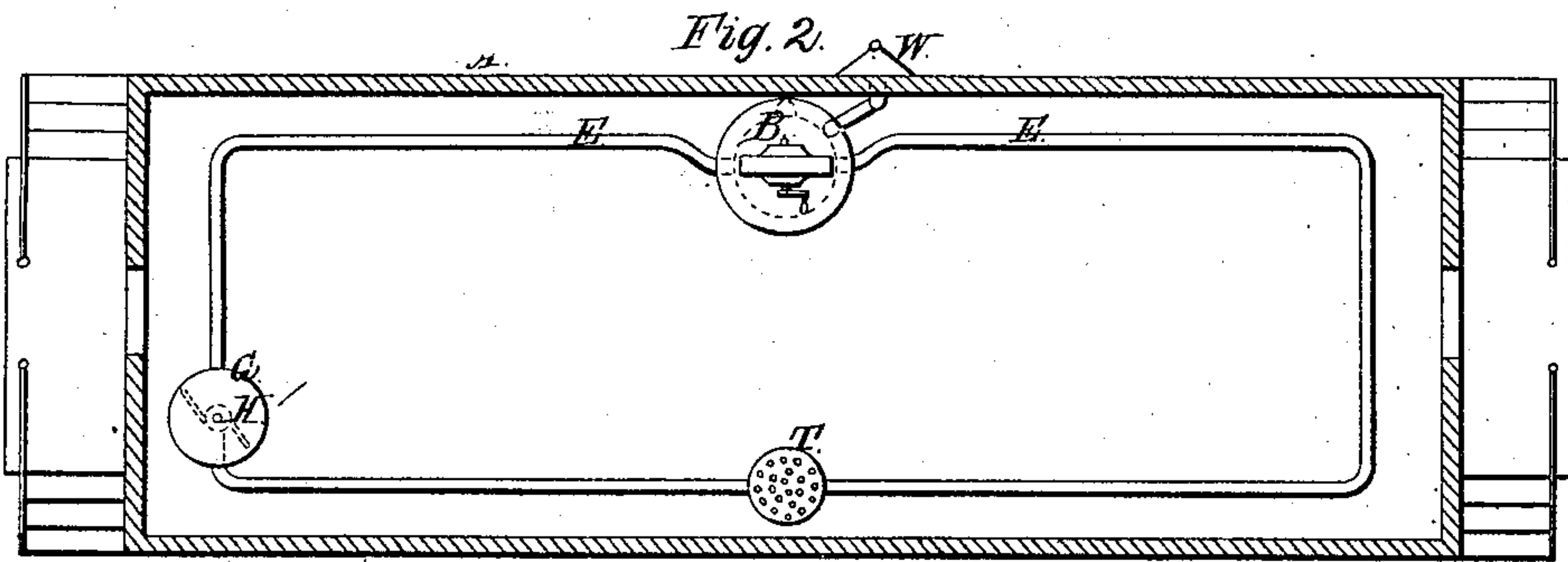


Fig. 4.

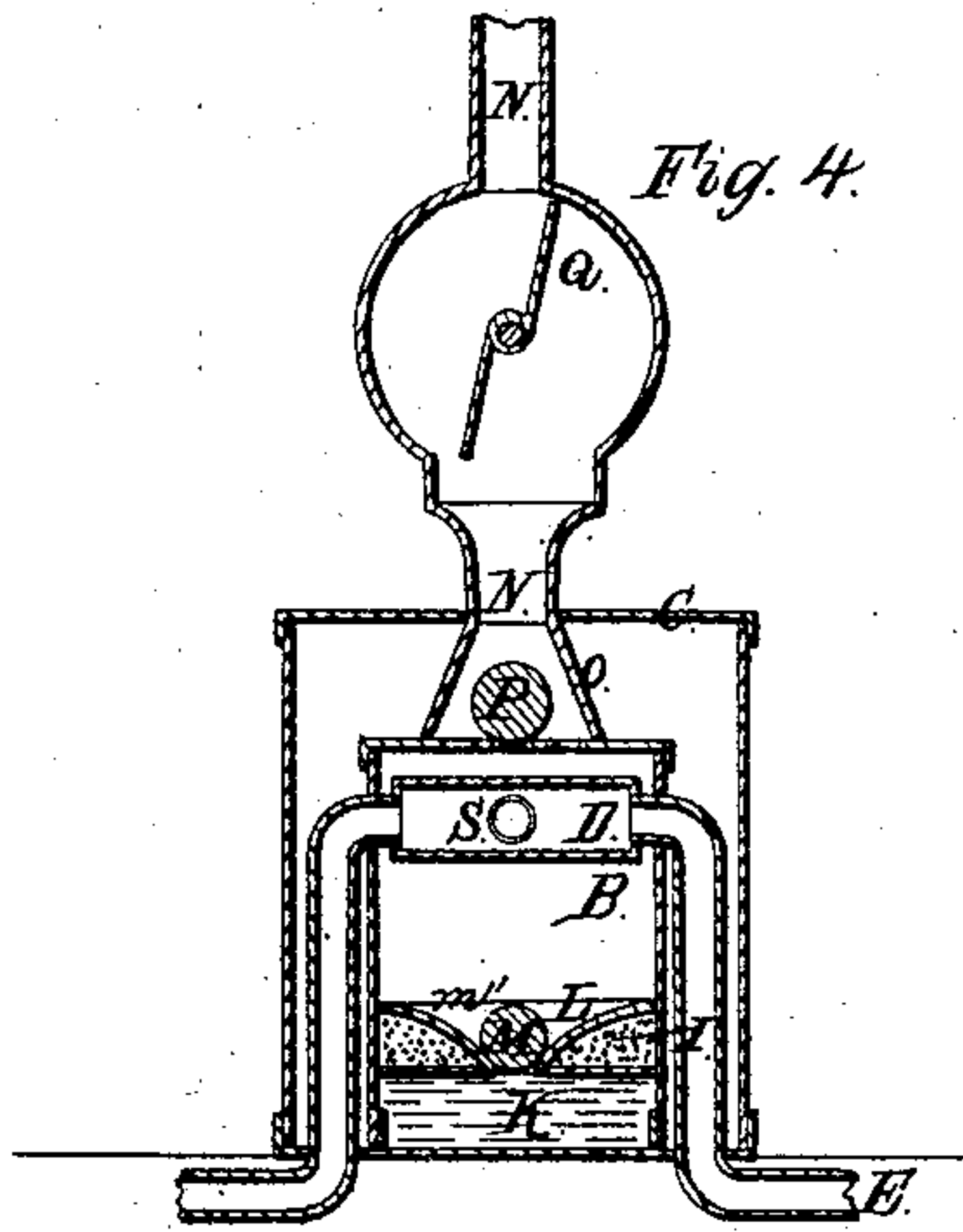
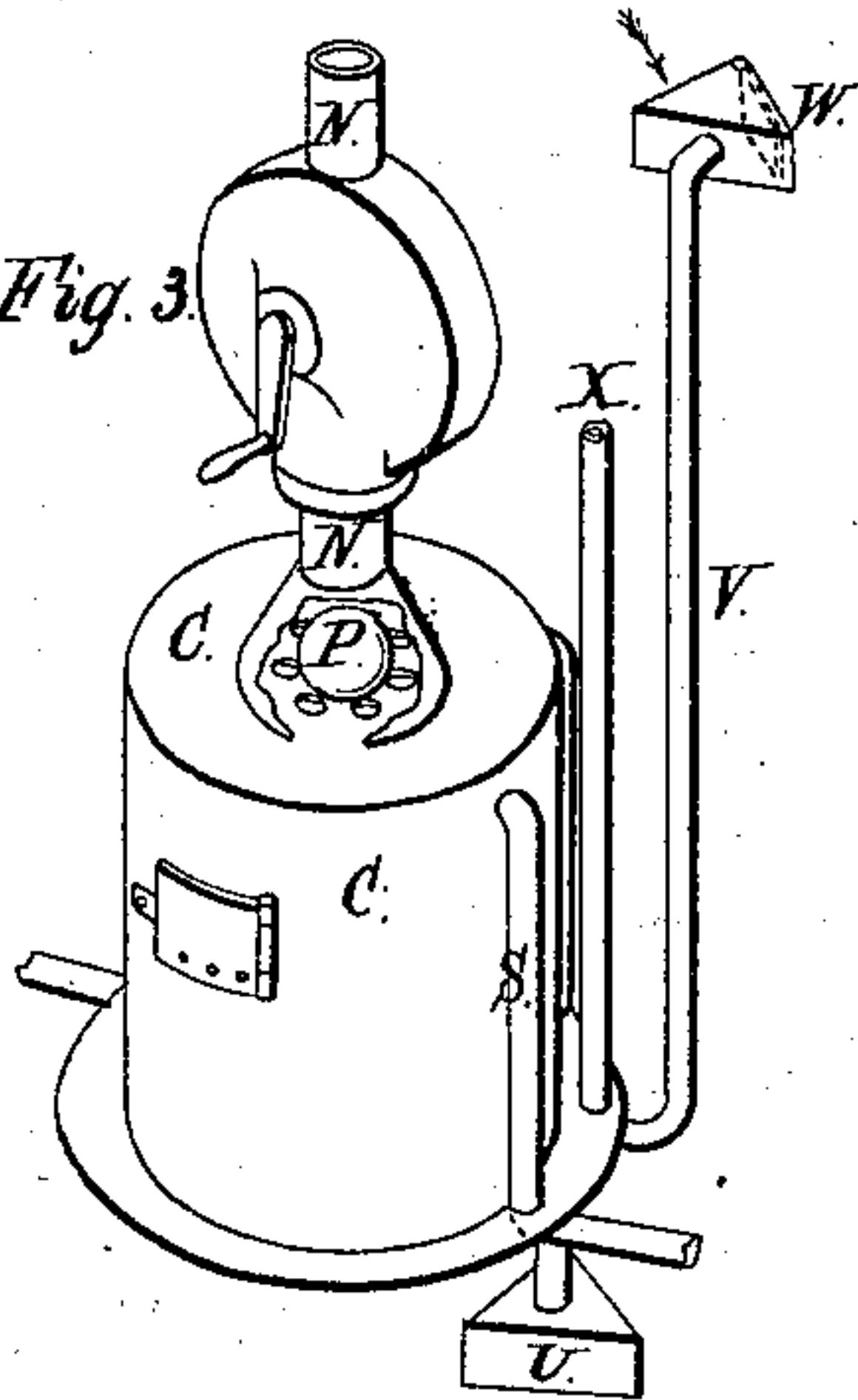


Fig. 3.



Witnesses.

*Wm. A. Barnack
Am. St. & T. Co.*

Inventor.

*Samuel Darling
by Crosby, Halsted & Gould
his Attorneys.*

UNITED STATES PATENT OFFICE

SAMUEL DARLING, OF BANGOR, MAINE.

IMPROVEMENT IN RAILROAD-CAR HEATING AND VENTILATING APPARATUS.

Specification forming part of Letters Patent No. 79,449, dated June 30, 1868.

To all whom it may concern:

Be it known that I, SAMUEL DARLING, of Bangor, in the State of Maine, have invented certain Improvements in Means for Heating and Ventilating Railroad-Cars, &c.; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

My invention relates to means for heating and ventilating railroad-cars, apartments, buildings, &c.; and it consists in combining with pipes which convey the heating or ventilating fluid an automatic fan-blower to impel the fluid through the pipes; in the combination, with the smoke-pipe of the stove or furnace, of a fan-blower and crank for the purpose of intensifying the draft in making or revivifying the fire; in such a construction of the stove as will cause the fire to be put out by the upsetting or severe tilting of the cars in case of concussion, overturning, or similar accidents occurring to the train; and in such a construction of the smoke-pipe as will automatically close it when the car overturns, and also in certain details.

My plan, as hereinafter described and illustrated, is adaptable either for heating by hot air or hot water, and for ventilating.

Figure 1 represents a longitudinal section of a car containing my improvements. Fig. 2 is a plan view of the same. Fig. 3 represents my improvements in the stove and its attachments upon a larger scale; Fig. 4, a vertical section of the same.

Like letters refer to the same parts in the different figures.

I shall first describe the construction and operation of my improvements when used for heating railroad-cars with hot air, which I consider preferable to hot water.

A represents the body of the car; B, a stove of any ordinary construction in its main features, but having certain peculiarities, hereinafter described; C, a safety-casing surrounding the same, and which I prefer to make of strong boiler-iron that it may the better withstand severe blows and shocks without liability to fracture in case of accidents, and when desirable I surround it with an outer jacket of wood. The stove and outer casing both have a close-fitting door capable of being kept tightly closed in any ordinary manner, the

door of the stove or parts beneath the grate having orifices sufficient to permit air to enter to make and regulate the draft.

Above the fire-chamber of the stove is secured a closed chamber or heater, D, (which forms a part of the air-passage,) of less size or diameter than the stove, and into opposite sides of which enters the heat-conveying pipe E. (Coiled pipe may be used within the stove instead of the chamber D.) The pipe E passes from this chamber downward within the space between the stove and its casing, thence taking a circuit or route around, but within the car and near the floor, or, preferably, sunk about flush therewith, and finally returning to and beneath the stove-casing, and then rising and again connecting with the chamber. This pipe may at each seat provided for passengers take a course in line with and in front of the seat, thus having a tortuous or zigzag path, and so afford a ready means for warming the feet of passengers, while whatever route it may take it will always, when laid on or near the floor, heat the lowest or coldest stratum of air.

Two parallel pipes, if desired, may be laid all around the car, one passing under the feet of each occupant of the usual double seats.

In order to insure a continuous circulation of the heated air through the pipes, I connect with the pipe at a convenient point above either of the axles of the car a chamber, G. This chamber forms a part of the air-passage, that part of the pipe which delivers to it entering at the center of the chamber, and that part which conveys from it connecting at its periphery. Within this chamber is centrally located a fan-wheel, H, whose shaft, descending through and beneath the car, has a miter-wheel secured thereon, and this wheel is driven by a corresponding wheel upon the ordinary axle of the car. By this means a positive motion is imparted to the fan-wheel, which thus impels the hot air forward and insures a steady circulation. Motion may preferably be given to this fan-blower by means of a wind-wheel made to revolve by the resistance of the air when the car is in motion. It may also be arranged with a hand-crank, so that the air can be circulated through the pipes when the car is at rest (or a separate blower may be provided for that purpose) in case the car cannot be heated by opening the door of the outer casing of the stove.

Where the heating-pipes do not extend a long distance it is preferable to heat by hot air. Water may be used to better advantage when great length of pipe is to be heated, as it will contain more heat and conduct it more rapidly to the pipe. The water may be made to circulate at the rate of about one hundred feet per minute; but when air is used it may circulate at the rate of one thousand feet per minute, more or less, according to circumstances. When air is used in the heating-pipes the pipes may be made of tin and should not be air-tight. When water is used the pipes and blower-chamber must be water-tight and have a perpendicular reservoir-pipe of any kind (and hence not needing to be described) as high as any part of the horizontal pipe, that the pipes may always be kept full. This reservoir-pipe may be attached to the fan-wheel chamber surrounding the fan-wheel shaft, which shaft should extend above instead of below the chamber to prevent leakage around the shaft.

Beneath the grating of the stove (which may be adapted for burning either wood or coal, as desired) I leave a space or chamber, I, filled with ashes or some other good non-conductor, and beneath this a water-chamber, K, to be filled with water in any convenient manner. The non-conducting chamber has in its center a deep conical opening or passage, L, which connects the fire-chamber above it with the chamber K. An iron ball, M, deposited loosely in this opening, serves to close it, except when by an oversetting or extreme tilting of the car it may be forced from its seat. A cover, m, is placed over this opening, secured in any manner sufficiently to hold its position except when the balls may force it away. From the top of this stove the smoke-pipe N passes, and it is to be continued out through the roof in the usual manner in order to discharge the gases and volatile products of combustion. I add, however, some new and important features. The pipe at its junction with the stove-top is made in the form of a truncated cone, O, and the stove at the base of this cone is perforated, as shown, and within this conical chamber I place a metal ball, P, which, when the car is in its normal condition, performs no duty and offers little, if any, obstruction to the proper draft and to the escape of gas, &c.; but when the car or stove is overturned the ball rolls into the smaller end of the conical portion of the pipe and closes the passage, thus stopping the draft and preventing the escape of fire, the pipe above this point—that is, above the outer casing—being made of ordinary strength only, so that any break or fracture in the pipe shall be likely to occur above this ball-valve and outside of the casing.

For the purpose of supplying air more plentifully to the stove an opening may be made in the bottom of the car, admitting the air between the stove and its outer casing.

In the stove-pipe itself, and above the top of the outer casing, I introduce a revolving fan-blower, Q, to be driven by a hand-crank, R, as shown. The object and function of this blower is to create a strong draft for kindling and quickly reviving the fire when the car is at rest.

In the methods above described for heating the pipes which convey the heating-fluid the pipes are endless, the same air or water continuing to revolve around through the pipes; but the pipes may be heated with or without the use of the blower by the following method, viz: The air is forced by the motion of the car through the pipe S, communicating with an inlet-box, U, similar to the box W, above described, into the chamber D, where it becomes heated, and thence flows through the pipe E and is delivered within the car by means of registers, as shown at T, which may be located in any part of the car desirable. I insert a wire-gauze within such registers and beneath the openings or perforations to prevent dust and cinders passing from the pipe in the car.

The inlet-box U may be located where it is found the least amount of dust, &c., will be admitted, and should be preferably protected by wire-gauze. These inlets are constructed with a swinging door, which will close one opening and open the other corresponding with the direction in which the car is moving.

In order to introduce fresh air into the car for the purpose of ventilation, I employ a pipe, V, communicating with inlet-box W, located outside of the car and similar in construction to the box U, above described. Such box should have a wire-gauze over the mouth of its pipe to prevent the entrance therein of dust, cinders, &c.

The tube V, I prefer should descend to the floor of the car, and then ascend between the stove and its outer casing and rise above the top of this casing, so that the air therein shall be warmed before it is discharged into the car from its open end X.

I claim—

1. In combination with an endless pipe for conveying a heated fluid, a blower operated, substantially as described, to cause a continuous circulation of the fluid in the pipe.
2. The combination, in a stove or furnace and beneath the fire-chamber, of a water-vessel and an intermediate non-conducting chamber having a ball-valve or its equivalent, substantially as and for the purpose described.
3. The combination, with the smoke-pipe, of a conical chamber and a ball-valve or its equivalent, substantially as and for the purpose described.

SAMUEL DARLING.

Witnesses:

JOHN E. HALL,
ALBERT W. PAINE.