2 Sheets—Sheet 1.

J. G. ALLEN.

Car Heater.

No. 107,149. Patented Sept. 6, 1870.

Fig 1

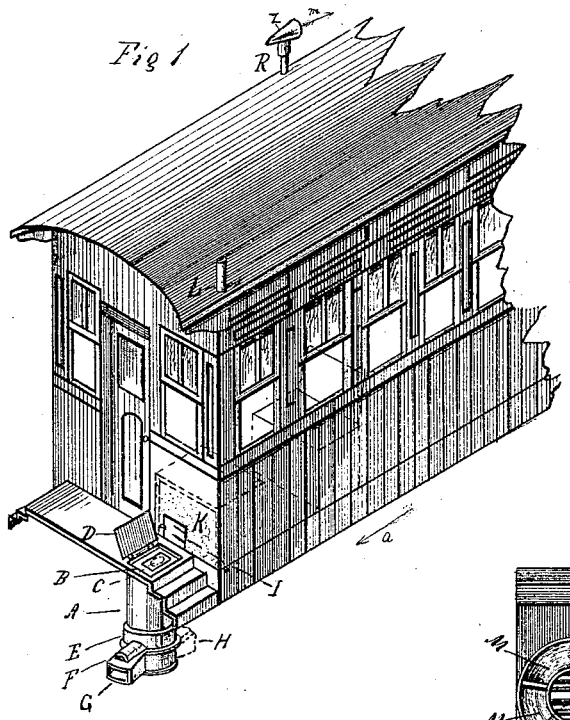
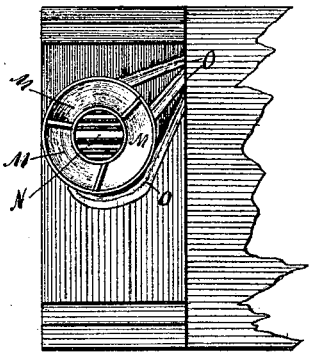


Fig 2



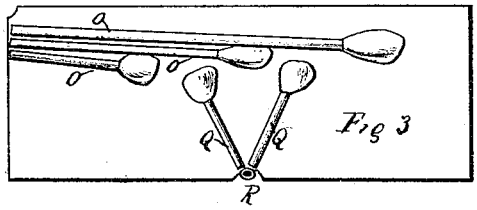


Fig 3

Fig 4

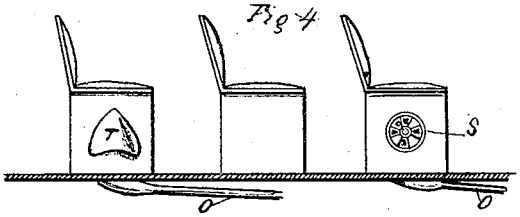


Fig 5

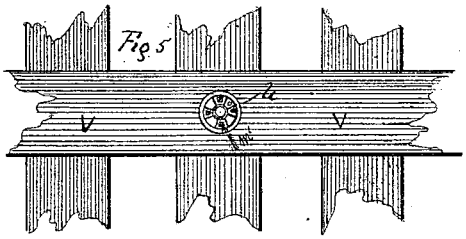
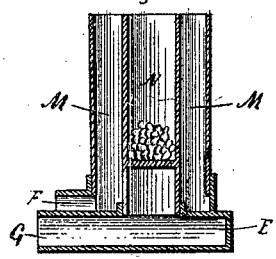


Fig 6



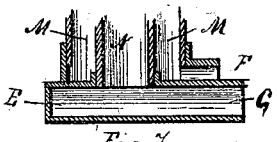


Fig 7

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J. G. Allen
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2 Sheets--Sheet 2.

J. G. ALLEN.

Car Heater.

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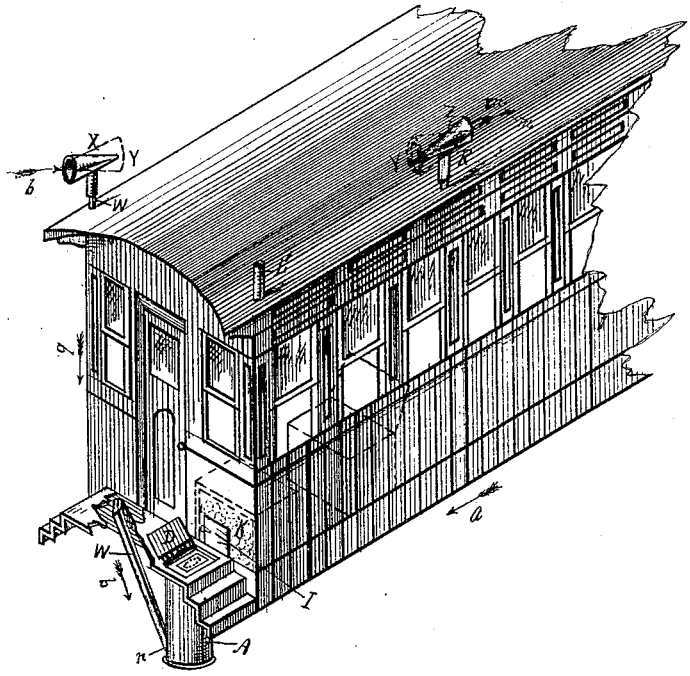
Fig 8



Witnesses / W. A. Weatherly / Edward Gerhard

Inventor / J. G. Allen / Phila. Penn.

UNITED STATES PATENT OFFICE.

JOSHUA G. ALLEN, OF PHILADELPHIA, PENNSYLVANIA.

RAILROAD-CAR HEATER.

Specification forming part of Letters Patent No. **107,149**, dated September 6, 1870.

To all whom it may concern:

Be it known that I, JOSHUA G. ALLEN, of the city of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in the Method of Heating and Ventilating Cars; and I hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, and the letters of reference marked thereon, like letters indicating like parts wherever they occur.

To enable others skilled in the arts to construct and use my invention, I will proceed to describe it.

The nature of my invention consists in improved methods of heating pure fresh air and conveying and distributing it to different and suitable parts of the car, and combining therewith an improved method of removing the foul and vitiated air. This I do by placing under the end platforms of the car a stove or heater, formed, essentially, after the pattern of common "portable heater," the air-chamber of which, however, I divide into several compartments, each separate and distinct from the other, and each having an independent pipe or flue, conducting the air, which is heated in each compartment, to a register or suitable outlet in any convenient part of the car; and it is particularly suggested that the ends of the seats adjacent or next to the aisle passing through the middle of the car may be used as one important location for those registers for the ingress of this heated air. In combination with this introduction and distribution of hot air, I propose to make numerous and ample openings in the lower parts of the car, and particularly in the floor of the car along the middle aisle, which passes between the ends of the seats. These openings for ventilation must be suitably connected with pipes or flues leading to the outside or top of the car, to which may be attached any of the well-known arrangements for creating or increasing a draft. Thus a continual change of air will take place in the car, fresh warm air being constantly introduced, while the cold used and vitiated air is constantly being removed.

I will now describe the details of my invention, as more fully illustrated by the drawings.

Figure 1 is an oblique view of one end of the car, showing the stove or heater in its position, also the position of the coal-bin, and the arrangements for opening through the platform to feed the fire, &c. A represents the portable heater or furnace situated underneath the platform, firmly attached to and suspended from it. By opening the trap-door D is brought into view the top of the furnace or heater, over which should be laid a slab of soapstone, B, to prevent the heat striking through and setting fire to the wood-work of the platform. Through both this slab of soapstone and the top of the heater is cut a hole or opening, C, leading into the fire-cylinder N, Fig. 2, for conveniently feeding the fire, &c. E is an adjustable and reversible cap or base, which may be turned and changed to any given direction, so as always to catch the draft and wind, from whatever direction it comes, which will almost universally be against the direction the car moves. F is the opening in the cap or movable base E, which catches and conducts the air to the several compartments of the hot-air chamber of the furnace or heater A. G is the opening to the ash-pan, and serves, also, for admitting air to the fire. The dotted lines H illustrate another position toward which the openings in the base may be turned when the car is moving the other way or the draft coming from another direction. I is the door leading to the coal-bin K, which is in a most convenient position under the end seat, and so contrived that fuel and dirt need never be carried into the car. L is the smoke pipe or flue from the heater.

Fig. 2 is a view looking from above down into the heater when the trap-door, floor of the platform, and top of the heater are removed or cut away, showing the fire-chamber N surrounded by the several compartments M of the hot-air chamber, from each of which leads a pipe or flue, O O O, conducting the hot air through the sides or any convenient part of the car, or under the floor of the car to any convenient place of exit, as shown in Fig. 3, which represents the floor of the car turn d upside down, or viewed from beneath, where are again seen the pipes O O O, leading and distributing the hot air into the car.

Fig. 4 shows in the end of the seat toward the aisle, at S, one of the registers or openings for the ingress of hot air coming along the pipes O. T shows a similar register, covered, however, as may become necessary, with

a bonnet or hood to throw the current of hot air downward, so as not to incommode persons occupying the opposite seat.

Fig. 5 shows the floor of the car along the aisle V between the seats perforated at U. This opening or register U is connected with the pipes Q, Fig. 3, leading to R, Figs. 4, 1, and 8, and is for the exit and removal of the lower strata of cold and foul air, which enters the register U in the direction of the arrow *m'*, passing through the pipes Q and R, and finally making its exit through the cowl Z in the direction of the arrow *m*.

Fig. 6 is a sectional view of the heater A, showing, N, the fire-chamber; M M, the compartments of the hot-air chamber; E, the adjustable cap or base, which may be changed to any convenient direction. F is the opening admitting air to the hot-air chambers. G is the opening admitting air to the fire and leading to the ash-pan.

Fig. 7 shows the same as Fig. 6, but particularly the reverse position of the adjustable base E, the same letters indicating the same parts as in the other figures. This reversible base E is shown as one means for supplying fresh air. It is, however, objectionable, in that the air thus drawn from under the car is loaded with dust raised by the rapid motion; sometimes, indeed, this would be intolerable. I therefore, Fig. 8, show a method for catching the air from above the car and conveying it to the hot-air chambers by the following device:

A flue or pipe, W, leading from the top of the car and opening into the base of the heater A, as at the point *n*, is surmounted at the top of the car with a cowl, X, so arranged as to keep its mouth or opening always toward and catching the wind, thus occupying a reverse position from usual. This result may be accomplished by the same means as applied in ordinary vanes or weather-cocks, or the cowls may be made to fit on tightly, so as not to revolve spontaneously, and be adjusted in their proper relative positions before starting. Thus when the car is going in the direction of the arrow *a* the cowl X will open forward, admitting fresh air from above the car to the hot-air chambers M in the direction of the arrows *b*, and so on through the pipes O and registers S and T, while the cowl Z, surmounting the ventilating-flue R, will be turned in an opposite direction, drawing the foul air through the register U along the pipes Q and flue R till it makes it exit, as indicated by the arrow *m*.

The dotted lines Y show the position the cowls would occupy when the car was moving in an opposite direction.

Heaters or stoves have heretofore been tried under the central parts of cars, but they could not be fed and the fire attended to while the car was in motion without opening into the car, and thus contaminating the air in the car with escaping smoke and sulphurous gases. These difficulties are avoided by placing the stove or heater under the platform. Moreover, there is another new and useful advantage in having it adjacent to a coal-bin or fuel-box so situated as not to occupy room in the car or necessitate the carrying fuel or ashes through or into the car.

It is probable that the outer wall of the heater may be advantageously made double, or that the whole will be better inclosed thoroughly to prevent loss of heat.

Having thus described my invention, what I claim is—

1. The heater A, having its body surrounded with an air-chamber, M, and its lower end provided with an adjustable hood, F, when constructed as described, and arranged under the platform of a car, so that the hood may catch the air-currents and direct them through the air-chamber into the car, as set forth.

2. The combination of the heater A, provided with an air-chamber, M, divided into compartments, with air-flues O O O of different lengths, each compartment having an air-flue, and said flues opening into the car at different points, as described, for introducing the air evenly throughout the car, as set forth.

3. The combination of an induction-pipe, W, provided with cowl X, with the air-chamber M, divided into compartments, and the air-flues O O O, as herein described.

4. The combination of the hood or cap E with the air-chamber M, divided into compartments, and the air-flues O O O, when constructed and arranged substantially as and for the purpose set forth.

5. In a railway-car having an air-chamber, M, divided into compartments, with hood E or pipe W, with cowl X, for supplying it with air, and with air-flues O O O, for introducing and distributing the air, the floor-registers U, pipe or air-flues R, and cowl Z, for withdrawing the air, substantially as set forth.

6. The arrangement of a portable heater, A, and coal-bin in a railway-car, as herein described, for the purpose of allowing the coal to be fed into the heater, as set forth.

J. G. ALLEN.

Witnesses:
W. H. WEATHERBY,
EDWARD G. KENT.