(No Model.)

T. McCROSSAN.

HEATER FOR CARS OR BUILDINGS.

No. 381,806. Patented Apr. 24, 1888.

Fig. 1.

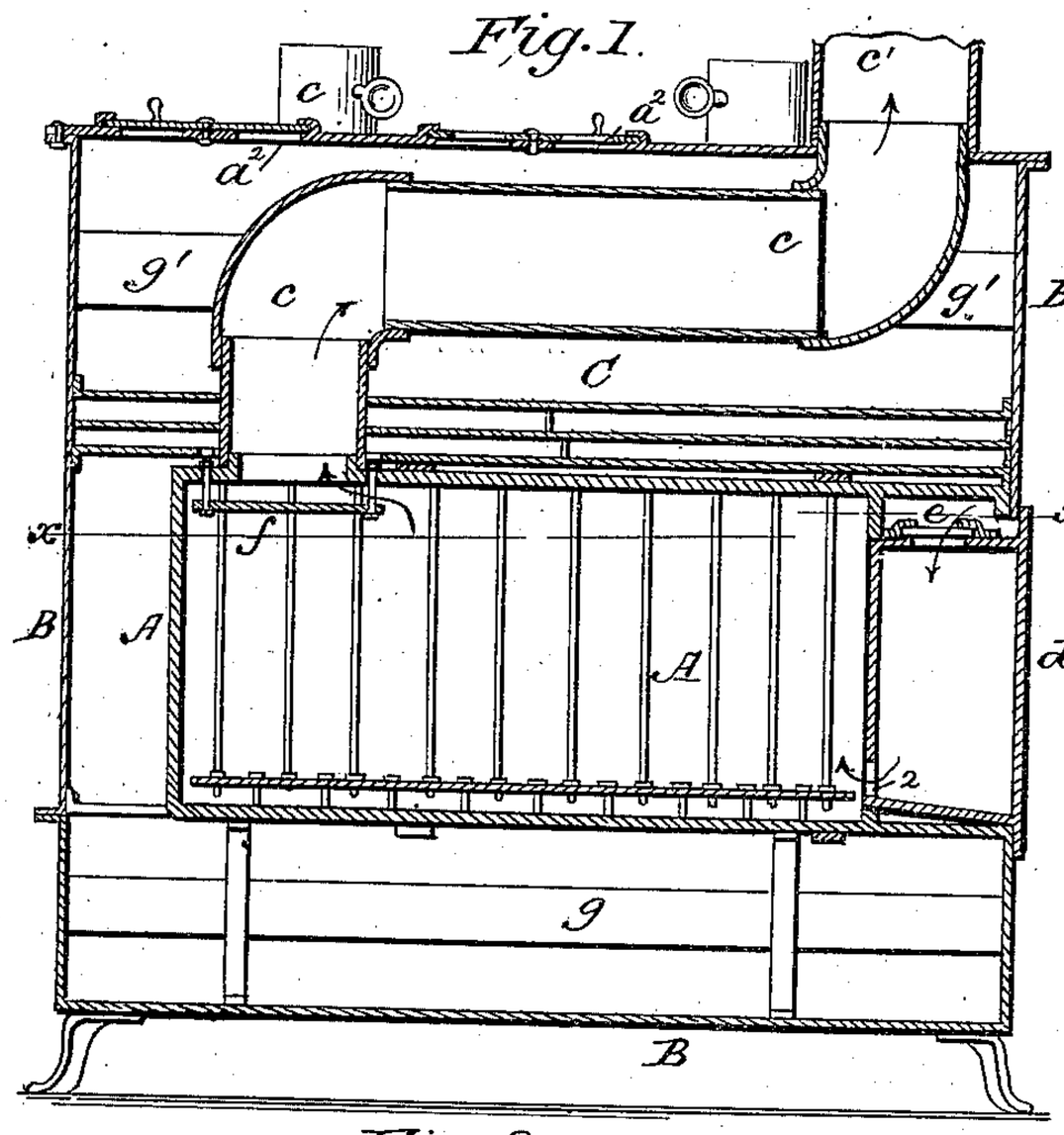


Fig. 2.

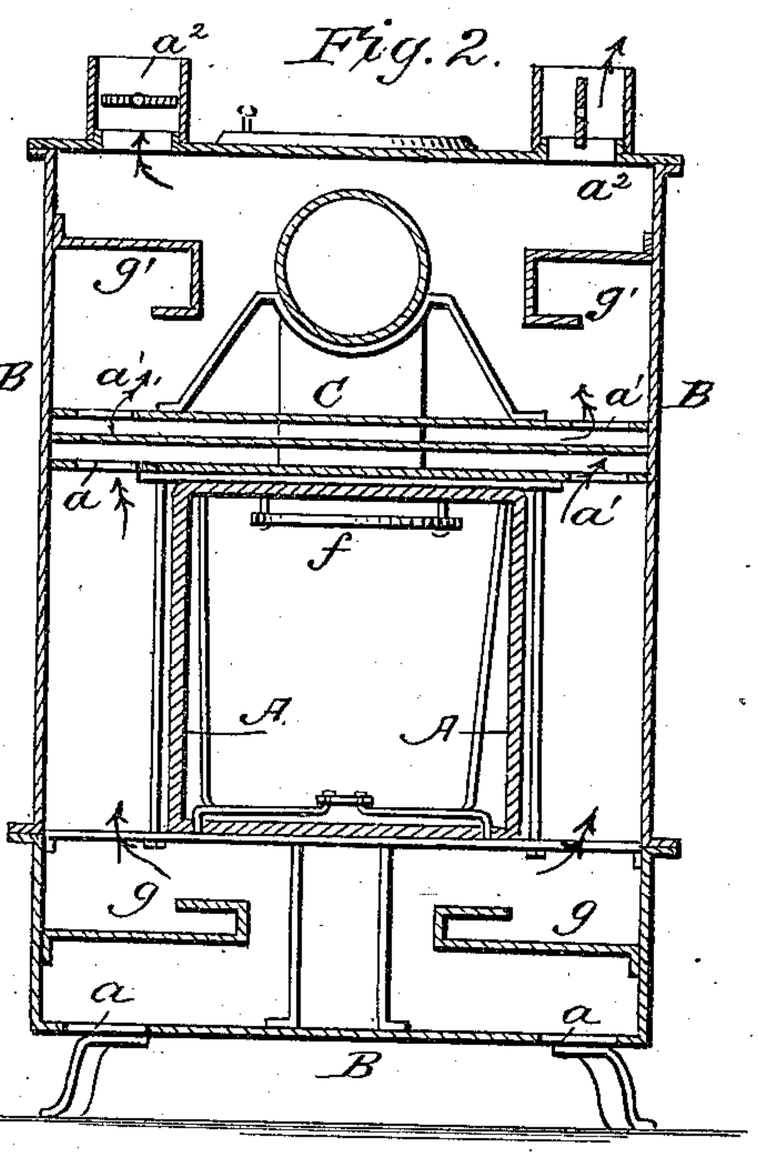


Fig. 3.

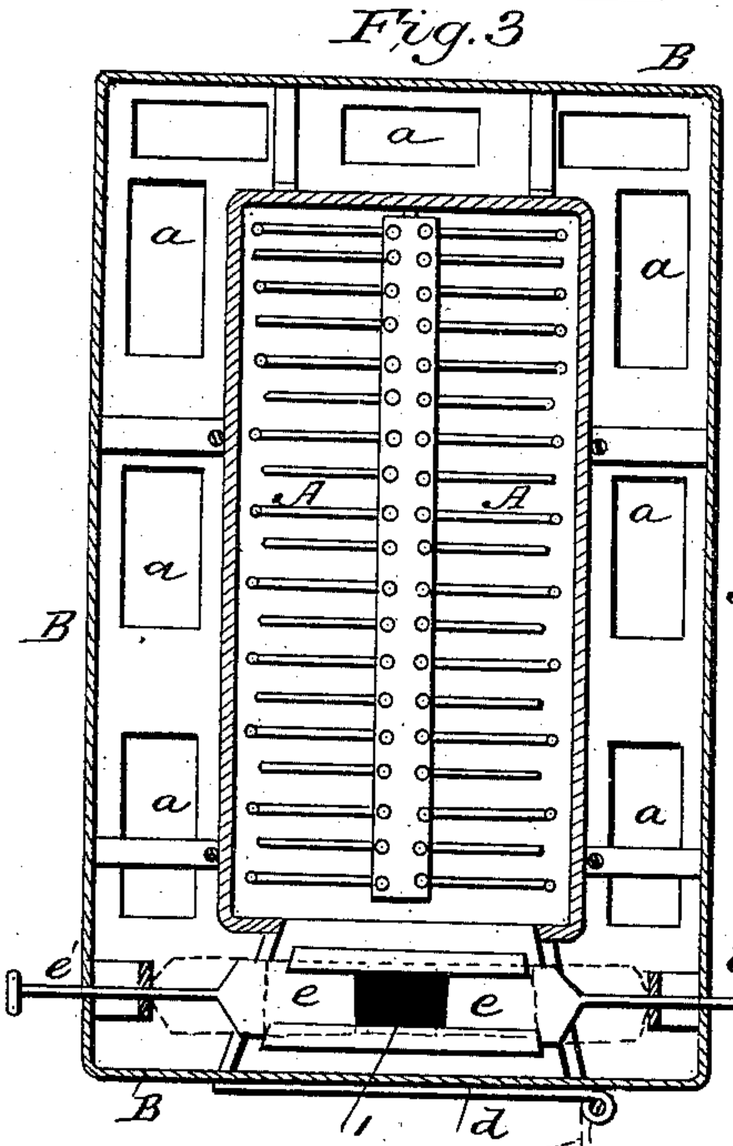


Fig. 4.

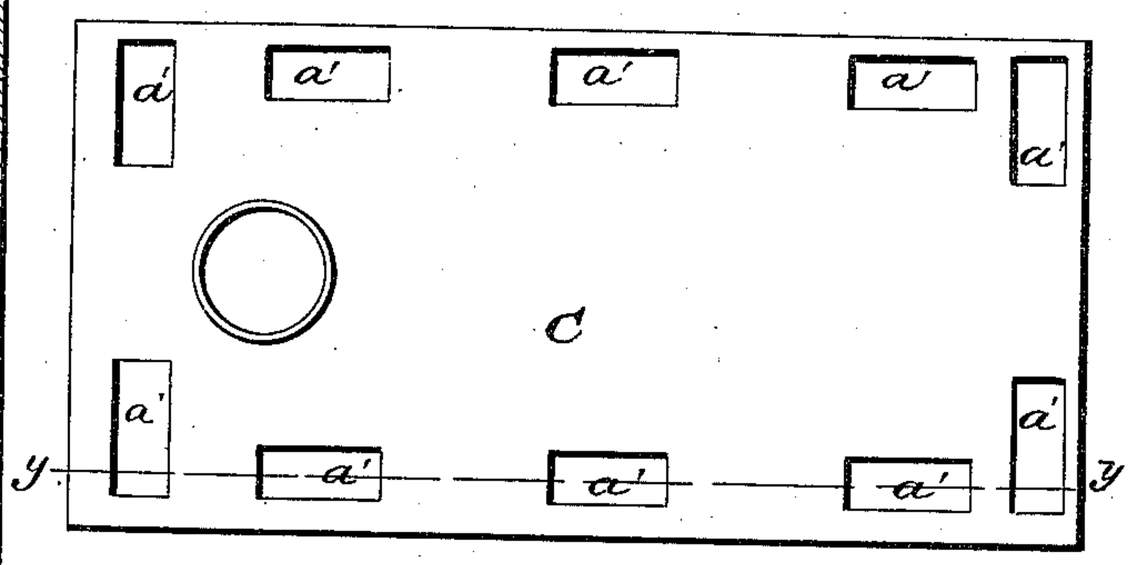


Fig. 5.

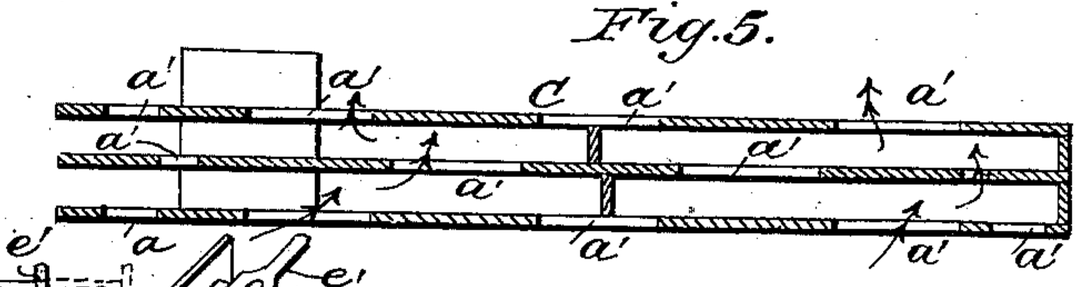
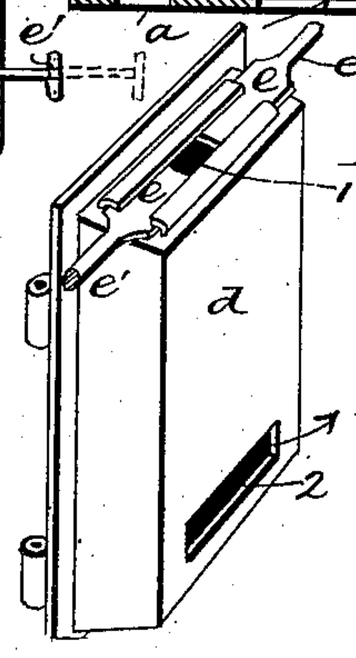


Fig. 6.



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UNITED STATES PATENT OFFICE.

THOMAS McCROSSAN, OF WINNIPEG, MANITOBA, CANADA.

HEATER FOR CARS AND BUILDINGS.

SPECIFICATION forming part of Letters Patent No. 381,806, dated April 24, 1888.

Application filed October 15, 1887. Serial No. 252,436. (No model.) Patented in Canada June 6, 1887, No. 26,899.

To all whom it may concern:

Be it known that I, THOMAS McCROSSAN, of Winnipeg, Manitoba, Canada, have invented a new and useful Improvement in Heaters for Cars and Buildings, (for which I have obtained a patent in Canada, No. 26,899, bearing date June 6, 1887,) of which the following is a specification.

My improvement belongs to the class of hot-air heaters. It is more particularly designed and adapted for use in railway-cars, although applicable for heating dwellings and public buildings as well. The fire-box is made of cast-iron and inclosed by a shell or casing of steel or wrought-iron, the two being separated by an air space or chamber, into which cold air is admitted, and from which it is discharged in a heated condition. The draft is supplied through the hollow door, the construction and arrangement being such that the slides for controlling the draft serve also as means for fastening the door. A movable plate or disk is also provided for automatically closing the smoke-exit. The details of construction, combination, and operation of parts are as hereinafter described.

In the accompanying drawings, Figure 1 is a central vertical longitudinal section of my heater. Fig. 2 is a central vertical transverse section of the heater. Fig. 3 is a horizontal section on line *x x*, Fig. 1. Fig. 4 is a plan view of the perforated diaphragm detached. Fig. 5 is a section of the diaphragm on line *y y*, Fig. 4. Fig. 6 is a perspective view of the door detached.

A indicates the cast iron fire-box, and B the steel or wrought-iron casing or shell. The fire-box A is contained within the casing B and separated from it by an air-space at all points—that is to say, on the top, bottom, sides, and ends. Suitable braces are interposed between the fire-box and casing for the purpose of holding them rigidly separated yet connected. The fire-box A is secured to the bottom of the casing B by means of iron rods; but for this purpose various other means may obviously be employed. I provide the casing B with a series of horizontal diaphragms, C, thus dividing its interior into two chambers, in the lower one of which the fire-box A is contained. These diaphragms have non-registering openings *a'*, corresponding to the openings *a* in the bottom of the casing B. (See Fig. 2.) The smoke-pipe *c*, attached to fire box A, passes longitudinally through the upper chamber and joins a vertical flue, *c'*, above the top of the casing. In the said top are also openings a^2, surrounded by circular flanges and provided with valves for regulating the exit of the heated air into the apartment in which the heater is located or the passage of such air into flues for conducting it to other apartments—that is to say, comparatively cold air is admitted through bottom openings, *a*, becomes heated in the space surrounding the fire-box A, then passes through openings *a'* into the upper chamber, and finally discharges through the top openings, a^2.

A special and important feature of my invention is the construction of the door *d* and the means for securing or fastening it. The door is hollow, and has an opening, 1, in its upper end, and another, 2, in its inner side near the bottom. The purpose of these openings is to enable air to be supplied to the fire-box A through the bottom openings, *a*, for supporting combustion without requiring any exterior draft-opening through the door, which would endanger the safety of the car in case of overturning.

To wholly or partly close the draft-opening 1, I employ slides or dampers *e*—that is to say, the said slides work horizontally across the top of the door in lips or flanges that serve as guides, Fig. 6, and are operated by rods *e'*, that work through holes in the sides of the casing B and in the jambs of the door.

The slides never require to be wholly withdrawn from the guides, save when the door is to be opened; and hence it will be seen that in addition to their ordinary or normal function the slides *e* serve also as means for securing or locking the door *d*, so that accidental opening of the latter in the case of accident—as when the stove is overturned—is impossible; and hence the burning contents of the fire-box A will not be discharged through the door-opening, so as to further endanger the safety of the car and passengers. To similarly prevent the contents of the fire-box A from escaping into the smoke-pipe in case of overturning of the car, I provide an automatically-closing valve, *f*, Figs. 1 and 2, which consists of an iron disk suspended by bolts that pass loosely through

holes in the top of the fire-box around the pipe-collar or smoke-exit. This disk being larger than the collar or exit and the bolts being free to move vertically, it will operate by gravity when the car overturns, and thus close the exit against escape of the burning fuel, cinders, &c.

On each side of the fire-box A, below the plane of its bottom and longitudinally above the air-inlets *a*, is located a metal pan, *g*, constituting a receptacle for live coals and cinders in case the stove should be overturned and the fire-box broken by the shock, so as to spill its contents. In other words, these pans would prevent the contents of the fire-box from escaping through the air-inlets *a*. Their inner edges are bent upward and then inward, to enable them to more effectually prevent escape of any burning fuel that they may chance to receive. Similar but inverted catch-pans, *g' g'*, are arranged directly above the former, *g g*, and above the plane of the top of the fire-box, to receive the burning fuel in case the stove should be turned upside down.

The three-part diaphragm C serves as an additional means for preventing the coals passing out at the top of the stove. It will be seen that if the coals should pass through the openings *a* in the lower plate of said diaphragm they would be arrested by the other two; yet the said openings allow free passage of heated air.

The single arrows indicate the direction of draft and products of combustion and the double arrows that of the heated air. In this instance I have shown the fire-box and casing as rectangular in form; but I propose to make them cylindrical in some cases.

What I claim is—

1. The combination, with the stove proper and its surrounding casing, between which is an air-chamber, as specified, of the hollow door which closes the registering openings in both said stove and casing and has itself an imperforate face and top and bottom air-openings, whereby, when the door is closed, air to support combustion is supplied through it from the said interior chamber, as shown and described.

2. The combination, with the fire-box and casing therefor, of the hollow door having an inlet from the upper air-chamber and an outlet into the fire-box, and slides working through the sides of the casing and in guides on the top of the door, whereby they are adapted for closing said inlet and also for fastening said door, as shown and described.

3. The combination, with the fire-box and a casing separated therefrom by an air-space and having air-inlets *a* in its base, of catch-pans *g*, having inwardly-bent edges and located in such space between the fire-box and inlets, substantially as shown and described.

THOMAS McCROSSAN.

Witnesses:
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