W. M. FULLER.

Railroad-Car Heaters.

No. 148,440. Patented March 10, 1874.

Fig. 1.

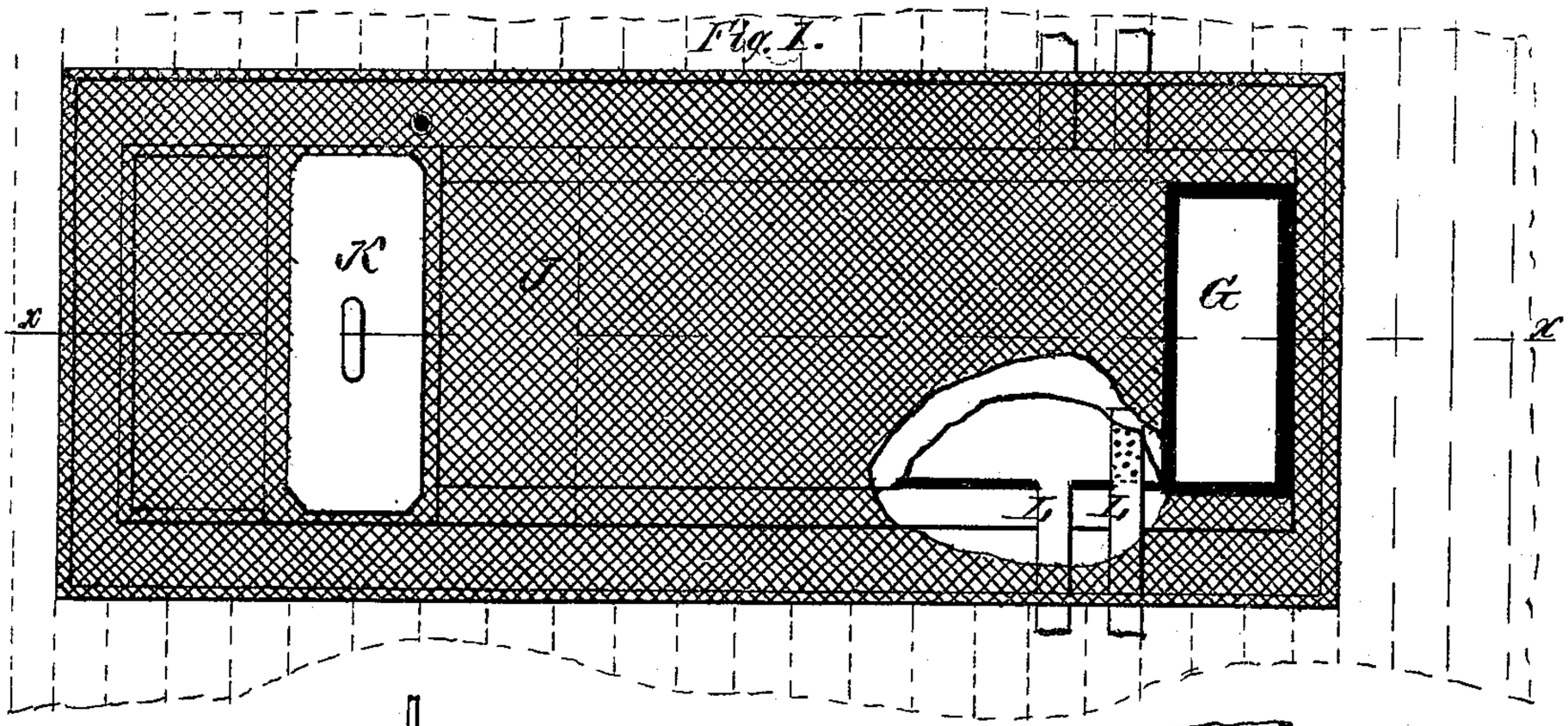

Fig. 2.

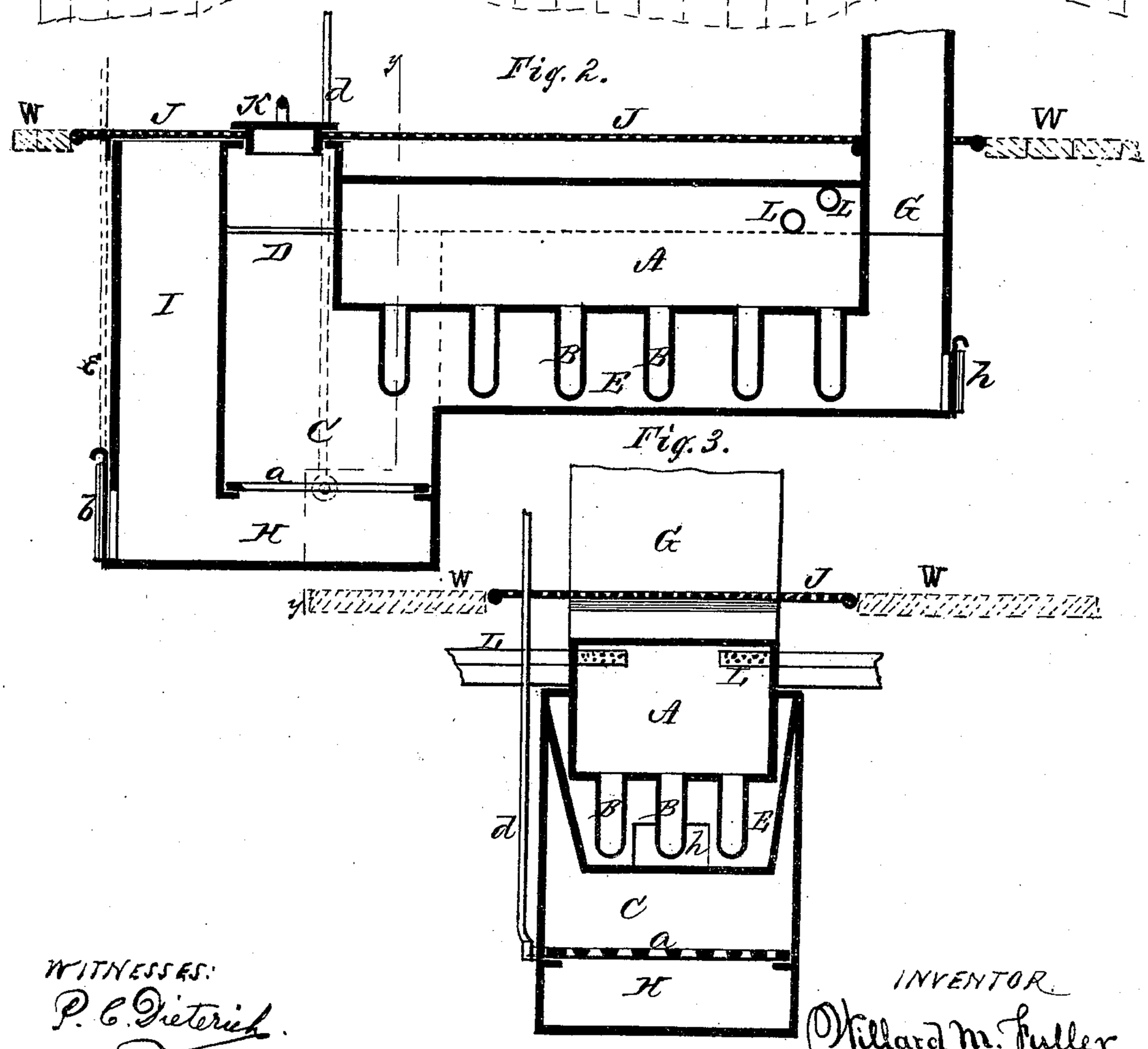

Fig. 3.

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WILLARD M. FULLER, OF NEW YORK, N. Y.

IMPROVEMENT IN RAILROAD-CAR HEATERS.

Specification forming part of Letters Patent No. **148,440**, dated March 10, 1874; application filed February 19, 1874.

To all whom it may concern:

Be it known that I, WILLARD M. FULLER, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Railroad-Car Heaters; and I do hereby declare that the following is a full, clear, and exact description thereof that will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings and to the letters of reference marked thereon, which form a part of this specification.

The nature of my invention consists in the construction and arrangement of a railroad-car heater, as will be hereinafter more fully set forth.

In the accompanying drawing, Figure 1 is a plan view of my car-heater. Fig. 2 is a longitudinal vertical section of the same through the line *x x*, Fig. 1; and Fig. 3 is a transverse vertical section through the line *y y*, Fig. 2.

A represents a boiler of any suitable dimensions, provided in its bottom with a number of descending vertical tubes, B B, which are closed at their lower ends, and increase the heating or steam-generating surface materially. C represents the fire-box arranged below and in front of the front end of the boiler A, and the walls of which extend upward at the front end of the boiler above the same, forming a magazine, D. E is the flue under the boiler leading from the fire-box C to the chimney G at the rear end of the boiler. *a* is the grate in the fire-box, with ash-pit H underneath. I is a draft-flue, extending in front of the magazine and fire-box down to the ash-pit H; and said flue is at its bottom, on the side, provided with a door, *b*, as shown in Fig. 2.

The heater, thus constructed, is located entirely under or below the floor W of the car, a place being cut out in the floor for the heater, and said space covered by a suitable grating, J, which has an aperture for the passage of the chimney G, and another aperture through which the cover K is placed on top of the magazine D. The fire being made on the grate *a* in the fire-box C, air is supplied to the fire downward through the grating J and draft-flue I into the ash-pit, and from there up through the grate into the fire-box. This downward draft, taking the air from the bottom of the interior of the car, also answers another very important purpose. It is well known that in a closed room or car, where many persons are breathing, the air soon becomes so impregnated with carbon as to be unfit for respiration, and that this impure air being heavier than pure air will settle down to the bottom of the car. By now taking the air from the interior of the car at the bottom to supply the fire, this impure air is drawn off, thus establishing perfect ventilation. The downward draft through the flue I is ordinarily sufficient to keep the fire going; but if more air should be required, especially when first starting the fire, the door *b* may be raised, more or less, by means of a rod, *e*, when air will rush in directly to the ash-pit and fire. After the fire is started, the magazine D may be filled to the top, and as the fire will not go above the top of the flue E it forms a perfect self-feeder. The cover K over the magazine D being closed when the magazine is filled with fuel, the draft from the flue I passes up through the grate *a* and under the boiler to the chimney G. Thus the magazine acts as the ordinary feeder in the self-feeding stove, in this instance the novelty consisting in the relation of the devices to the car-floor W, in order that the attendant may attend to and regulate the device from the inside of the car, at the same time having the boiler and fire below the car-floor out of the way, and allowing the water to return by its own gravity to the boiler, and also furnishing a means of ventilation to the car. At the end of the flue E is a door, *h*, for purposes of cleaning out the flue and chimney. The grate *a* is provided with a suitable shaker-rod, *d*.

This heater is intended to heat the car by steam, on the same principle as described in the Letters Patent Nos. 144,527 and 145,167, heretofore granted to me; and, as the boiler is located below the bottom W of the car, the

return of the water of condensation is greatly facilitated. The car is also heated by radiation from the boiler through the grating J.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The draft-flue I and grate J, in combination with the grate *a* and boiler A, all arranged below the car-floor W, said flue I serving the purpose as a draft-flue and ventilator, substantially as and for the purpose specified.

2. The magazine D, provided with cover K, in combination with the flue I and boiler A, arranged below the car-floor W, as and for the purpose herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand.

WILLARD M. FULLER.

Witnesses:
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