

(No Model.)

2 Sheets—Sheet 1.

F. KRANWENKAL & W. KELLEY.  
RAILROAD CAR HEATER.

No. 408,113.

Patented July 30, 1889.

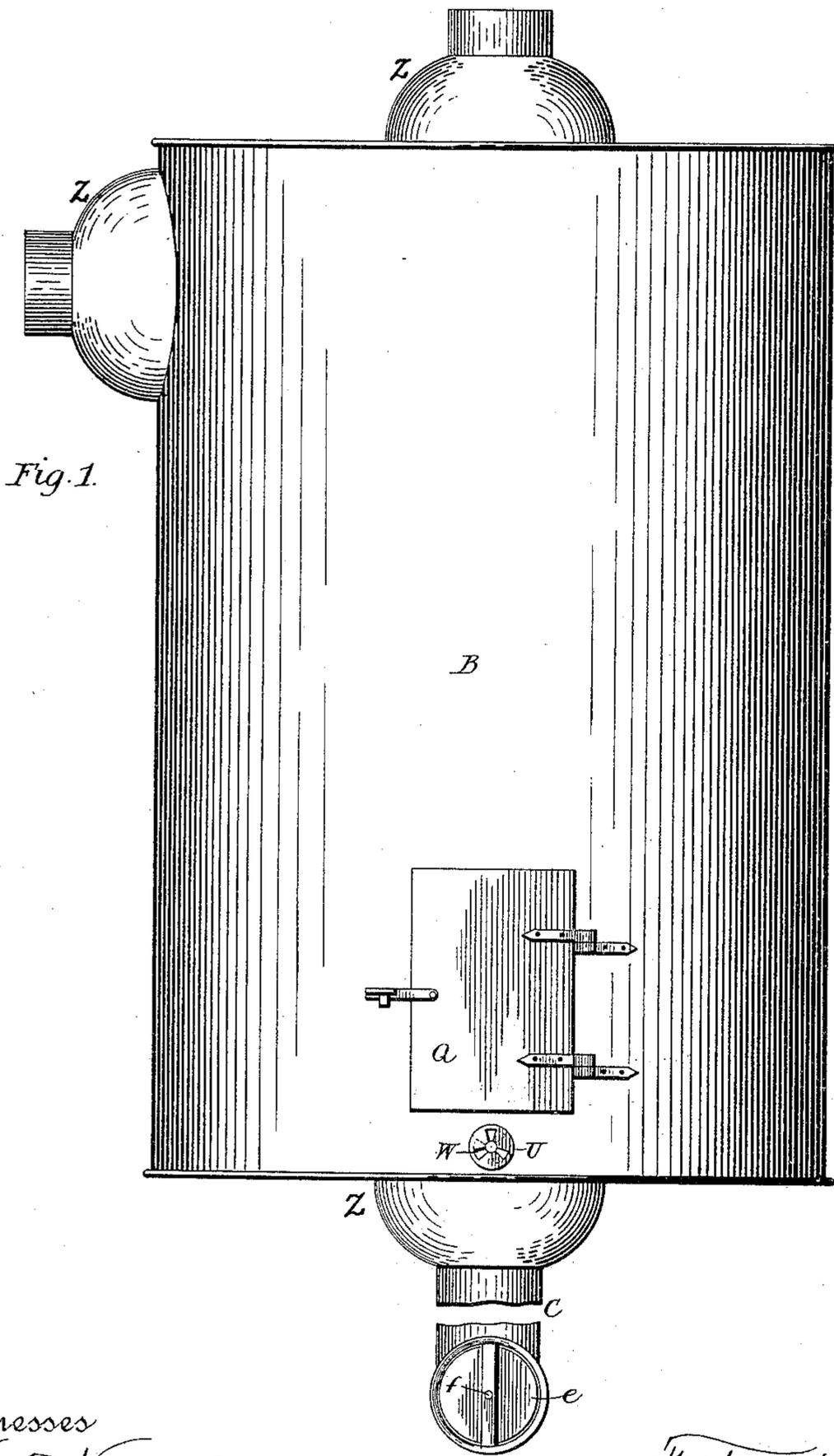


Fig. 1.

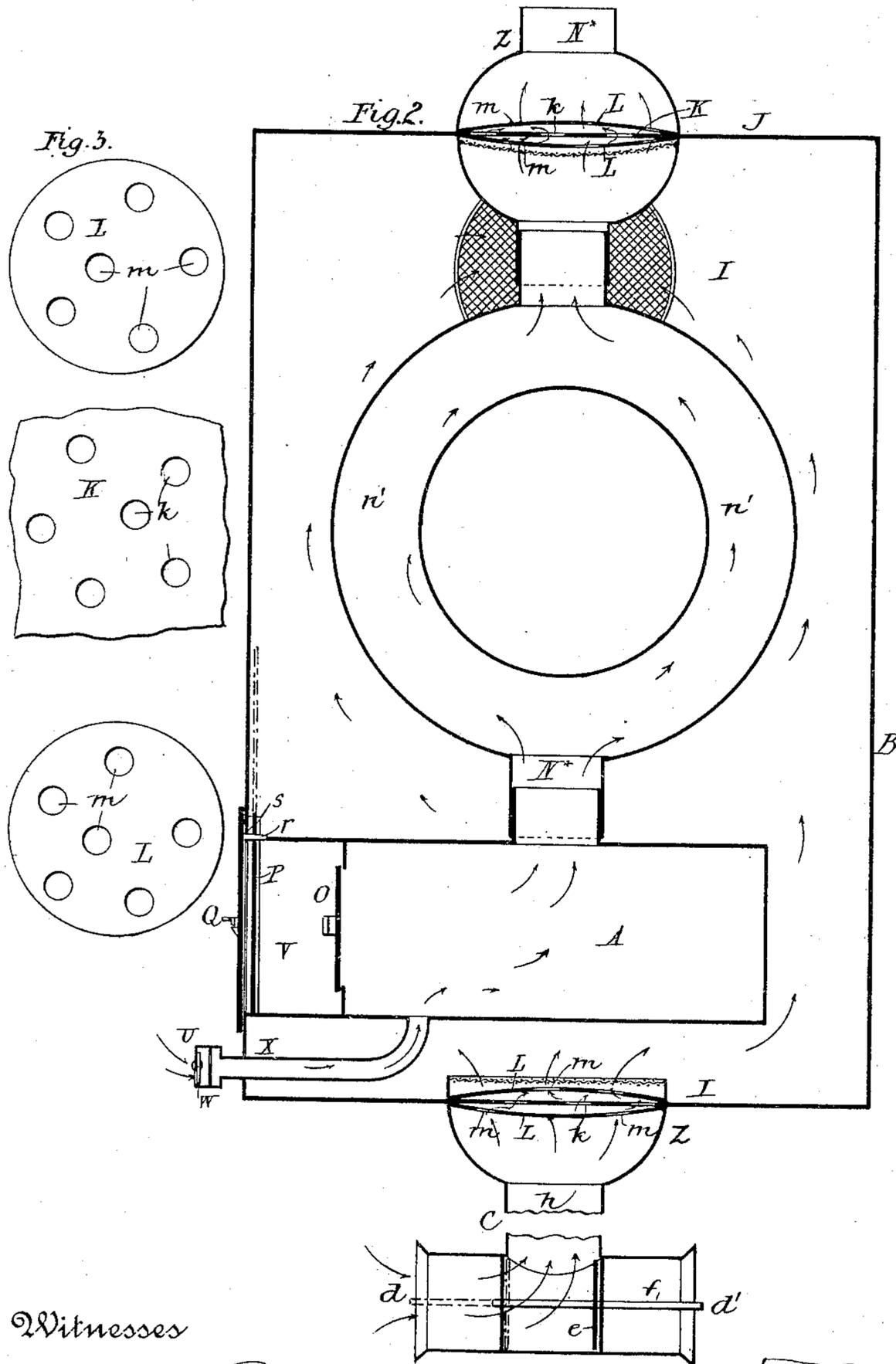
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# UNITED STATES PATENT OFFICE.

FARDENAND KRANWENKAL AND WILLIAM KELLEY, OF AURORA, ILLINOIS.

## RAILROAD-CAR HEATER.

SPECIFICATION forming part of Letters Patent No. 408,113, dated July 30, 1889.

Application filed February 1, 1889. Serial No. 298,361. (No model.)

*To all whom it may concern:*

Be it known that we, FARDENAND KRANWENKAL and WILLIAM KELLEY, of Aurora, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Railroad-Car Heaters; and we do hereby declare that the following is a full, clear, and exact description of the invention, which 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 letters of reference marked thereon, which form a part of this specification.

The objects of our invention are to provide a heater that shall be absolutely safe in case of derailment, collision, or other accident, and such in its construction as to render it practically impossible to set the car on fire, even if the stove be upset or smashed.

The nature of our invention will clearly appear from the following, aided by the drawings, in which—

Figure 1 illustrates in elevation a heater embodying our improvement; Fig. 2, a vertical central section of Fig. 1; Fig. 3, a detail view showing the parts constituting the safety devices.

In a general way, it is a stove A confined within a wrought-iron or steel box or drum B. The supply of air to be heated is preferably taken from the outside of the car beneath the floor. It is passed upward into and through the box or drum and the stove or heater which is inclosed therein, and then out of said box or drum into the interior of the car or coach. The air-inlet pipe C is preferably placed so that its lateral branches  $d$   $d'$  shall be in line lengthwise of the car, so that whether the coach runs in one direction or the other the air is gathered by the funnel-mouths of either the branch  $d$  or  $d'$  and passed upward through the heater and into the coach. This inlet-pipe is provided with a nicely-adjusted automatic slide-valve, which consists of a plate or disk  $e$ , carried on a rod  $f$ , supported in bearings which limit its range of motion to one side or the other of the inlet-mouth of pipe  $h$ , and by its action insures a steady upward forced current of air through

the heater or drum when the car is running. When the car is not running, the valve does not act, and the air will then pass upward on either side or both sides of the valve, dependent on its then position. At the point where the cold air enters the box or drum and where the heated air leaves the same the means provided for absolutely preventing any fire from escaping in case of a "smash-up" are as follows:

The walls or bottom I and top J of the box or drum constitute one thickness of metal, and through this metal one or more holes  $k$ , of a size suitable for the passage of the air, are made. A general description of the construction of one of these safety devices will answer for both. On both the outside and inside of the top and bottom of the drum or box where this hole (or holes) K is made there is securely fastened a plate L, that is made curved or slightly dish-shaped, so that they may resemble two tea-saucers, the concave sides being next the part I or J, respectively, and covering the part having the hole or holes K, but not lying flat thereon.

Each plate is provided with a hole or holes  $m$  of the same area as the holes  $k$ . These plates L are preferably made of copper or mild steel, and the holes through them, as also those through the drum or box, are "staggered"—that is, they are so placed relative to each other that each hole is covered from view by that part of the plate where there are no holes. In other words, none of these holes coincide with each other. The plates being "dishing," it will now be seen that a free passage for air is provided, and for air only, as no solid matter could pass through. If preferred, these plates may be covered and protected by brass or copper wire-netting  $n$ , as shown.

Now it is evident that in case of a smash-up these plates are not likely to spread apart, but they are likely, because of the material of which they are made, to be closed up together and flattened, so as to completely or more effectually close up the air-passage. Consequently no fire could get out through them. As a still further safeguard, these air-passages are preferably covered by heavy

hemispherical cup-shaped protectors Z, of copper or mild steel, which makes them doubly secure against fire in case of accident.

The smoke-pipe N\*, which is inside the drum B, branches into two passages in the form of a circle n', as shown, thus giving a longer route and imparting more heat to the air in the drum, and it is also provided with substantially the same means already described for preventing the escape of fire, and which therefore need not be described anew.

The heater itself may be of any kind or type, as preferred, and burn wood or coal.

There are three doors through which fuel is supplied to the heater—viz., the inner door O on the inclosed stove A, a middle sliding door P on the inside of the drum B, and the outer hinged door Q on the outside of drum B. The first and last of these (O and Q) are provided with any of the well-known locking devices; but it will be observed that the outer door Q also has a pin r, adapted to project through a small hole s in the drum, and it cannot project through the sliding door P, except when this slide-door is closed, and so as to bring a hole t made therein to a position to coincide with hole s. When these holes coincide in position, pin r can enter then and close the outer door Q; but when they do not coincide the end of the pin is arrested by the slide-door and cannot be closed. The slide-door cannot open until the opening of door Q sets it free. The latching or locking of door Q thus locks positively door P. Draft—*i. e.*, air—is supplied to the heater through a pipe U, as shown, and copper or mild steel is preferred for it, so that in a smash-up it also will double up, and thus prevent any fire getting out at that point.

A closed passage-way V connects the doorway of stove-door O with that of the drum B.

To govern the draft for the stove, any ordinary register may be used, as indicated at W, applied to a pipe X, leading to the under part of the stove.

The supply of air to be warmed may also be governed, either at the inlet or outlet, by any known kind of register or by a damper. Thus pure warm air may be continually supplied to the coach, and in such quantities as may be found desirable.

This invention has been thoroughly tested and found to operate satisfactorily, and as

few locomotives are provided with boilers sufficiently large to supply the necessary steam to warm the coaches constituting a train, and as it has recently been demonstrated, the damage to passengers is far greater in steam-warmed coaches in case of accident than in those warmed by ordinary stoves.

In case of accident, steam-heating pipes are sure to be broken and passengers scalded, and so quickly that there is no time for escape.

Railroad managers greatly prefer the stove, because of its convenience, if it can be so arranged as to be safe.

In case of a "breakdown" of the engine the passengers in steam-warmed trains are very likely to suffer from cold, and even freeze to death, because the engine cannot supply any steam.

This heater would seem to meet every requirement and to be safe from fire, cheap, and easily constructed.

We claim—

1. In a railway-car heater, the combination of a stove-surrounding drum having the openings therein and the two concave or dish-shaped plates L, secured over the same, as set forth, such plates also having openings therein, but lapping or not registering with those in the drum, substantially as and for the purposes set forth.

2. In combination, the perforated drum, concave perforated plates L, applied thereto, as set forth, the wire-netting n, and exterior hemispherical protectors, all substantially as described.

3. The combination of the drum provided with a doorway, guides on its inner surface, and a hole near the doorway, a vertically-sliding door operating in said guides adapted to close the doorway when in its normal position, and having a hole registering with the hole in the drum when in said position, and a swinging door provided with a latch-pin adapted to enter the holes in the drum and sliding door when the doors are in their normal or closed position, substantially as described.

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