(No Model.)

R. M. BACHE.

SAFETY SELF EXTINGUISHING CAR STOVE.

No. 376,275. Patented Jan. 10, 1888.

Fig. 1.

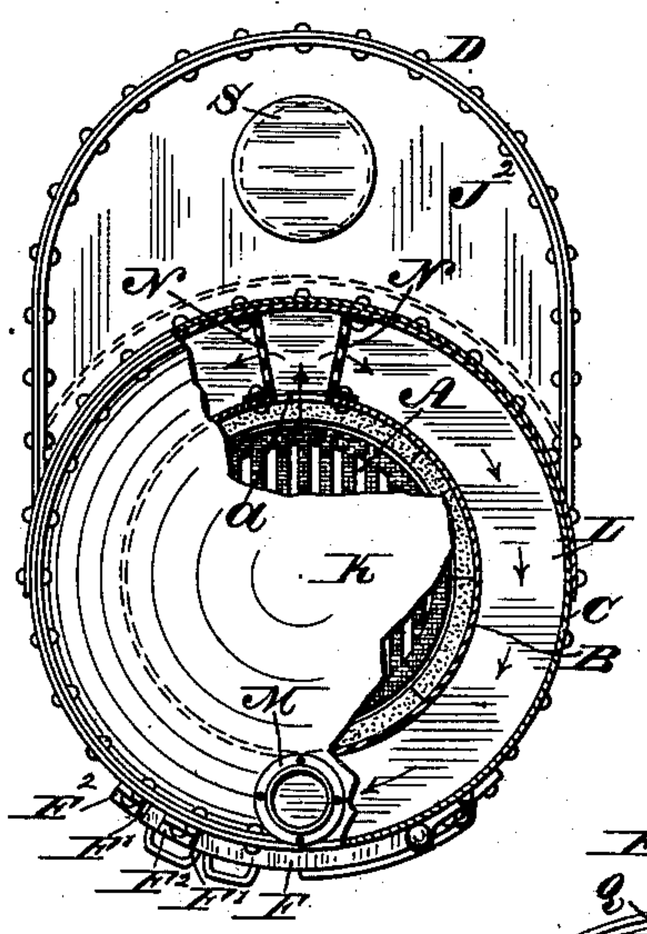


Fig. 2.

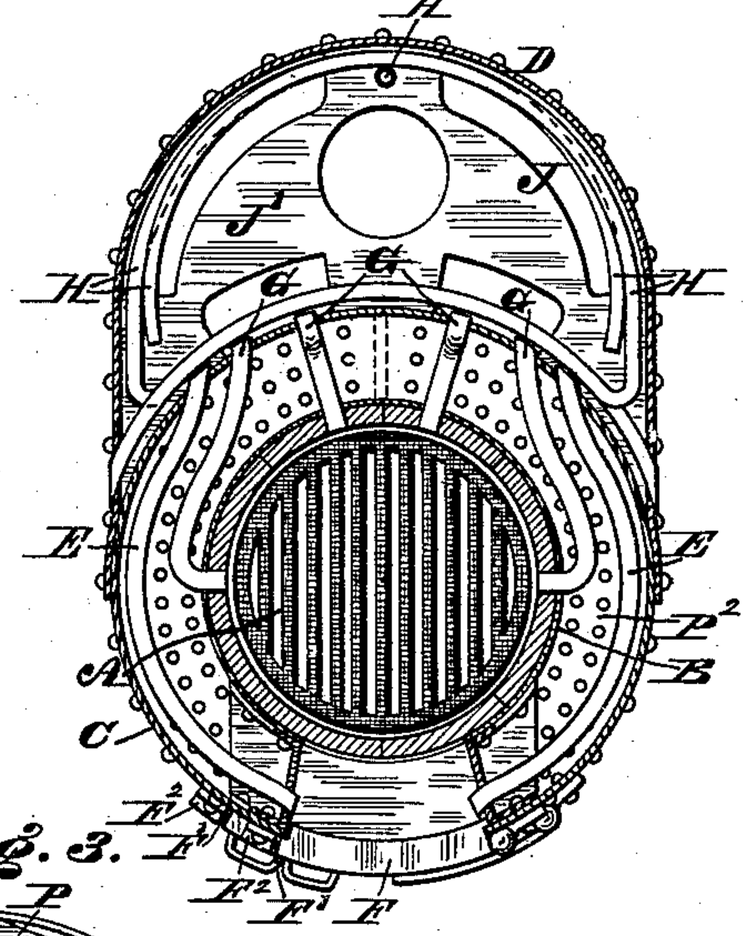


Fig. 3.

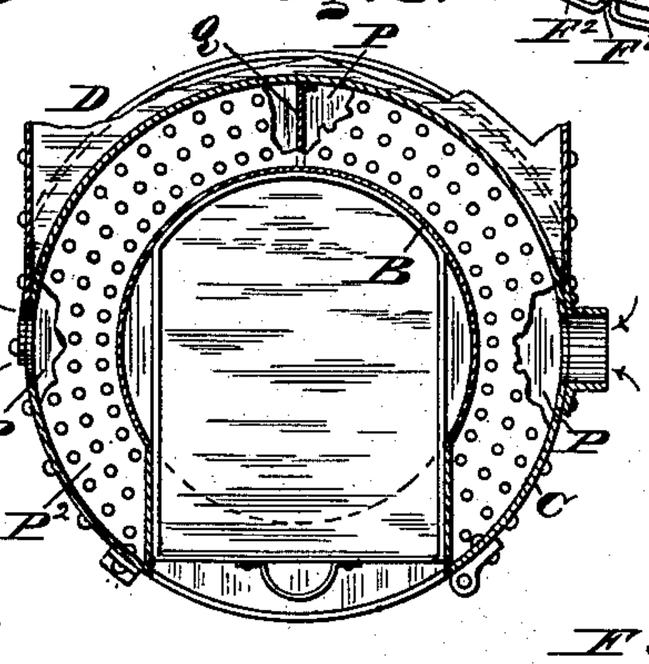


Fig. 6.

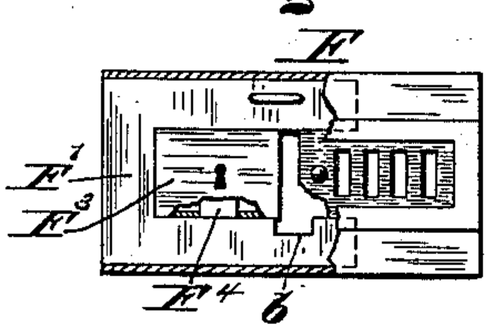


Fig. 7.

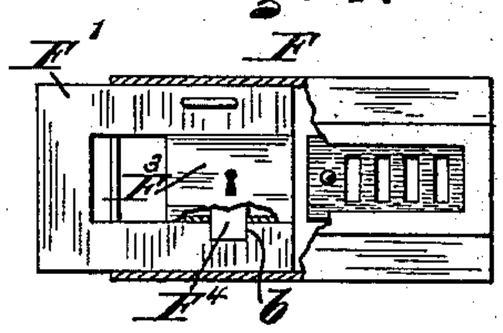


Fig. 4.

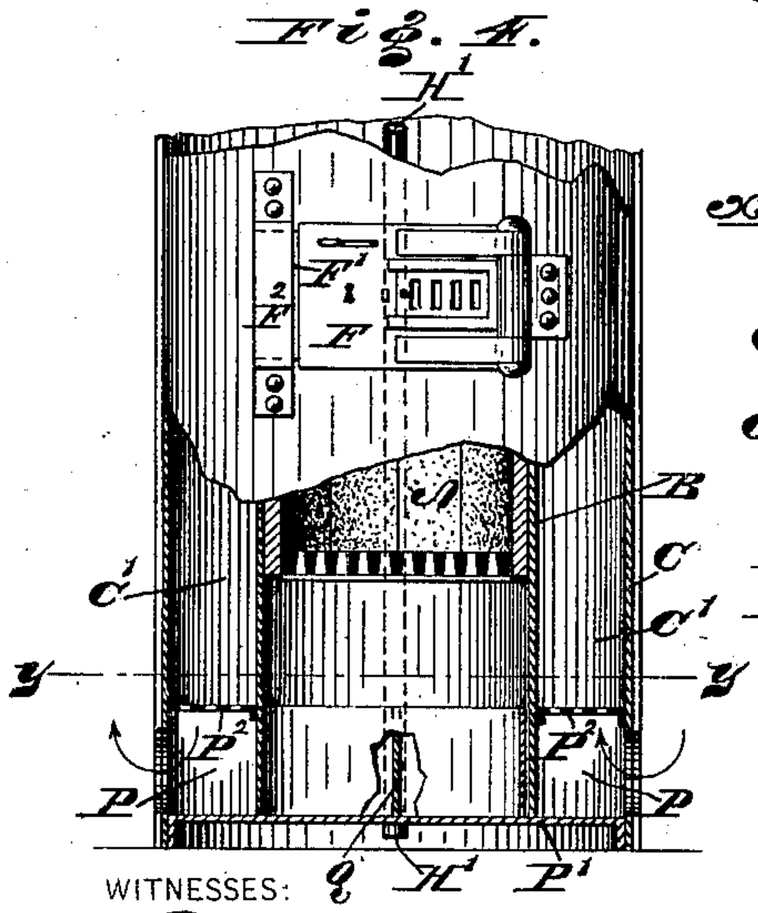
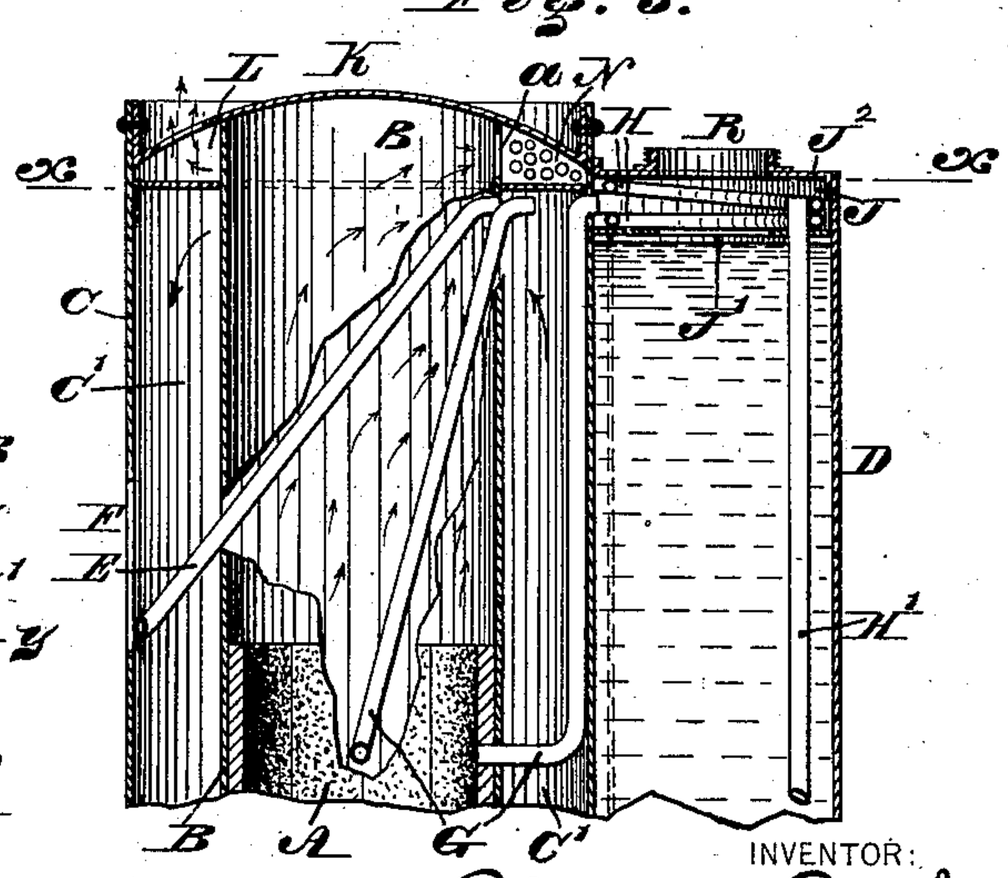


Fig. 5.



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R. MEADE BACHE, OF PHILADELPHIA, PENNSYLVANIA.

SAFETY SELF-EXTINGUISHING CAR-STOVE.

SPECIFICATION forming part of Letters Patent No. 376,275, dated January 10, 1888.

Application filed May 5, 1887. Serial No. 237,268. (No model.)

To all whom it may concern:

Be it known that I, R. MEADE BACHE, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Safety Self-Extinguishing Car-Stoves, which improvement is fully set forth in the following specification and accompanying drawings.

My invention consists of a safety self-extinguishing car stove having novel features, as will be hereinafter fully set forth.

Figure 1 represents a top or plan view, partly broken away, of a safety self extinguishing car-stove embodying my invention. Fig. 2 represents a horizontal section in line *x x*, Fig. 5. Fig. 3 represents a horizontal section in line *v v*, Fig. 4. Fig. 4 represents a partial front elevation and partial vertical section of a portion thereof. Fig. 5 represents a vertical section of a portion. Figs. 6 and 7 represent views of the stove-door on an enlarged scale.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings, A represents the fire-pot within the inner casing, B.

C represents the outer casing, which encircles said casing B, having a hot-air chamber, C′, between them.

D represents a water-reservoir, which is firmly secured to the stove proper, and may be in direct contact therewith or separated therefrom a short distance, as shown by the dotted lines, Fig. 1, said reservoir being in communication with the fire-pot A.

E represents pipes—in the present case two in number—which are open at each end, and passing from the top of the reservoir to the bottom corners of the feed-door F of the stove, said pipes ending inside of, but capable of passing streams of water through, the aforesaid door.

G represents pipes—in the present case four in number—which pass from the reservoir into the fire-pot, so as to direct water into the latter when the stove is upset and ceases to stand in upright position.

H represents pipes, which are located within a chamber, J, in the upper part of the reservoir D, one end of each pipe opening into said chamber and the other end opening into the atmosphere, each of the said pipes passing around the said chamber within and near the inner walls thereof, the open inner end of each pipe being on the same side of the chamber as the open outer end, and both of the openings of either one of the pipes being on the opposite side of the chamber from the openings of the other pipe, said chamber being formed by a perforated or slotted diaphragm, J′, and the top J^2 of the reservoir.

In addition to the pipes H, I employ a pipe, H′, (one or more,) which extends from the outside of the reservoir, through said reservoir into said chamber, the object being in either case to supply said chamber with air, whereby in the event of upsetting the stove water from the reservoir will pass into the chamber J, and from thence enter the pipes E, H, and G.

The top of the fire pot or chamber is closed by a dome, K, and surrounded by a collar forming a flue, L, which is in communication with the interior of the fire-chamber by means of a throat, *a*, and forms a smoke-flue, which is in communication with the stove-pipe collar M. Within the flue adjacent to the throat *a* are perforated diaphragms N, which are firmly secured to the walls of the flue, and, while permitting the products of combustion to pass to the stove-pipe, they serve to prevent fuel entering said flue in the event of the overturning of the stove.

The doors of the stove are each provided with a horizontal bolt, F′, which engages with a keeper, F^2, on the casing or body of the stove. A lock-case, F^3, is secured to the door and has a vertically or auxiliary moving bolt, F^4, which is adapted to enter a recess, *b*, in the bolt F′, and thus prevent movement of the bolt and consequent opening of the door. In order to open the bolt F′, a key is inserted in the case F, so as to raise the bolt F^4, whereby said bolt F′ may be readily withdrawn from the keeper and the door then opened.

At the base of the stove is an air-flue, P, which is formed by the inner and outer casings, B C, the floor P′ of the stove, and a perforated plate, P^2, at top, the latter being secured to said casings. A single diaphragm, Q, is introduced midway in said flue P with relation to the air-supply pipes, so that air is directed into one of the compartments formed by the diaphragm Q, thence issues through

the perforated plate above said compartment into the chamber C′, where it is heated, and thence escapes through the other portion of the perforated plate into the compartment below it, from whence it is directed into the car. (See Figs. 3 and 4.)

On the top of the reservoir D is a collar, R, which is closed by a screw-cap, S. The opening formed by said collar is employed for replenishing the reservoir and regulating the height of water therein, the cap of course being duly removed. The diaphragm J′ is intended, primarily, as a check to the injurious action of the wave motions of the water in the reservoir.

In practice the parts are preferably constructed of boiler-iron or steel in cylindrical form, so as to possess great strength and durability.

By the system of air-tubes employed valves heretofore in use in car-stoves are dispensed with.

Remembering the positions of the fire-extinguishing pipes with reference to both stove and reservoir, it will be evident that as soon as the apparatus departs in any direction from the vertical some or all of the streams of water begin to operate. In no position in which the apparatus can lie, if placed horizontally and revolved about its axis by rolling on the ground, can water escape from the two air-tubes on top of the reservoir. In no position, therefore, when so horizontally placed and rolled, can air fail continuously to enter the said air-tubes and supply the atmospheric pressure necessary to the free flow of water from the fire-extinguishing pipes. In some of these horizontal positions the air-tube, passing through the bottom of the reservoir, would also supply air to the reservoir, while in others it would emit water, and if the apparatus were on its side one fire-extinguishing pipe after another would also supply atmospheric pressure as the level of the water in the reservoir fell below each one successively.

In no deviation, then, of the apparatus from the vertical one, in which it is upright, down to that in which the top has reached the ground, and in no position in which it may lie horizontally on the ground, can the air-tubes fail to supply the reservoir with air, and in consequence in none of these positions can the fire-extinguishing pipes fail to act. It can be seen from the drawings that the reason of this is that from the upright to the horizontal position, inclusive of both, no head of water is available for passage through the air-tubes on top of the reservoir, for it can there be seen that in all of these positions the surface of the water is below the upper curves or vents, as the case may be, of the air-tubes. In consequence of the reservoir in its upright position not being filled nearer to its top than about three inches, it happens that from the upright to the horizontal position, as the apparatus departs from the vertical and reaches the horizontal position, the surface of the water must always be below whatever air-tube curves or vents chance to be uppermost; but there are, nevertheless, positions in which the two air-tubes on top of the reservoir would not only not supply air to the reservoir, but in which they would continuously emit water instead of admitting air. These positions are those in which the apparatus is more or less head downward. The contingency of its being thrown and resting more or less head downward is, however, met by the insertion of the air-tube rising from the bottom of the reservoir. To sum up, then, the air-tubes on top of the reservoir act as air-tubes in all positions of the apparatus from the upright one to and inclusive of those represented by the apparatus rolling in any number of horizontal positions; but they do not act as air-tubes. On the contrary, they emit water in any positions from and inclusive of those in which the apparatus is exactly upside down, through all positions in which still to any degree head downward it makes any angle but the smallest with the horizontal plane; yet, in the various positions of being more or less head downward, what the air-tubes on top of the reservoir cannot accomplish in the way of supplying atmospheric pressure is performed in their stead by the air-tube rising from the bottom of the reservoir. In other words, it is shown that the apparatus continues uninterruptedly to act irrespective of the position in which it may be placed. It only remains to show that even if it occurs (which occurrence depends upon the circumstance of position) waste of water from either system of air-tubes is so small in comparison with the whole volume contained in the reservoir as to be of no consequence. When a reservoir of proper size for a stove of standard car-stove dimensions is filled to the height prescribed of about three inches below the top, it holds about two cubic feet, or six brimming bucketfuls, of water. The caliber of the six fire-extinguishing pipes being about an inch each, that of the two air-tubes on top of the reservoir only about three-sixteenths of an inch each, and that of a single air-tube in the reservoir only about a quarter of an inch, it will readily be seen that while the water in the reservoir is being voided any waste through either system of air-tubes must be insignificant. Both systems, as already noted, cannot in any position of the apparatus emit water, for, as has been shown, one of the systems is always supplying air. Again, only in the position of the apparatus being head downward would the system of air-tubes on top of the reservoir void water continuously, but at the same time the one air-tube through the bottom of the reservoir would be admitting air. On the other hand, with the apparatus in any horizontal position, the two air-tubes on top of the reservoir would not void water at all, while the single air-tube in the reservoir would, if the apparatus were prone on its back, void water continuously; if prone on its side would void water until the reservoir was

exactly half exhausted by the fire-extinguishing pipes, and if prone on its face would not, from beginning to end, void water at all.

If the apparatus stood plumb on its head, the whole body of coal would lodge in the inner casing of the stove at the top of the cylinder, and there the fire-extinguishing streams would drench it in mass. In only one accidental position of the apparatus—that of being on its back—would no discharge of water from the fire-extinguishing pipes take place; but then, under the circumstances, no discharge would be necessary, because the whole contents of the stove would lie safely within the inner casing above the front of the reservoir, but the fire-extinguishing pipes would have been discharging continuously through any gyrations which the apparatus may have made in reaching this as well as any other eventual position, and by that time have put out the fire in the stove.

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

1. A car stove having the fire-pot A, the inner casing, B, the outer casing, C, the water-reservoir D, having perforated diaphragm J′, forming top chamber, J, the pipes G, leading from the top chamber, J, into the said fire-pot, and the air-pipes H in said chamber J, each of the said pipes having one of its ends opening into the chamber and the other opening into the atmosphere, both of the said openings of one of the pipes being on the opposite side of the chamber from the openings of the other pipe, said parts combined substantially as and for the purpose set forth.

2. A car-stove having a fire-pot, inner and outer casings, a water-reservoir with perforated diaphragm, forming the top chamber, J, the pipes G, leading from said chamber into the fire-pot, the pipes E, leading from the top chamber to the inside of the feed-door F, and the pipes H within said chamber J, each of said pipes H having its ends opening on the same side of the chamber, one within and one without the walls thereof, both openings of the one pipe being on the opposite side of the chamber from the openings of the other pipe, and the pipe H′, having its lower end open to the atmosphere at the base of the reservoir and its upper end opening in chamber J, said parts combined substantially as and for the purpose set forth.

3. A car-stove having a fire-pot, inner and outer casings, a water-reservoir with upper chamber therein, pipes leading from said chamber to within said fire-pot and to within the feed-doors of said casings, the pipes H in said upper chamber, and the pipe H′, leading from the atmosphere at the base of the said reservoir to said upper chamber, said parts being combined substantially as and for the purpose set forth.

4. A car-stove having a fire-pot, in combination with the inner casing, B, having opening *a*, the outer casing, C, the dome K, with smoke-flue M, a diaphragm between said casings B and C, forming, with the casings B C and dome K, the chamber L, and perforated diaphragms N in said chamber L, substantially as and for the purpose set forth.

5. A car stove having a fire-pot, an inner casing, an outer casing with openings at its base, a perforated diaphragm between said casings, and the vertical partitional diaphragm Q, extending from the base to said perforated diaphragm, said parts being combined substantially as and for the purpose set forth.

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