

H. H. Bryant.

Fire-Proof Safe.

N^o 79,808.

Patented July 14, 1868.

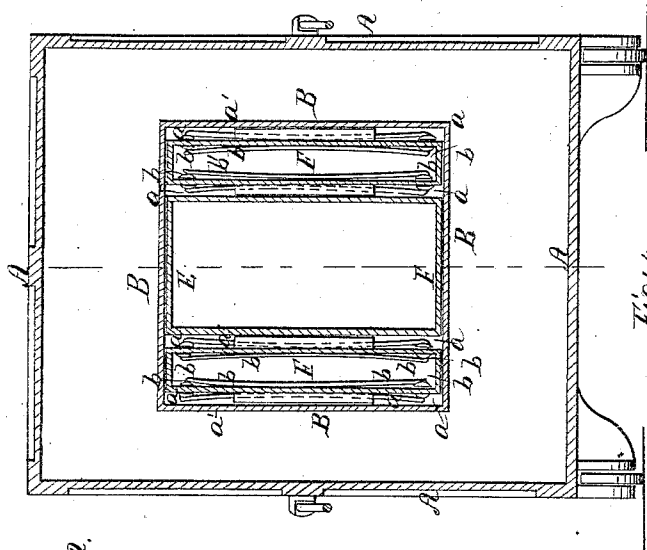


Fig. 2.



Fig. 4.

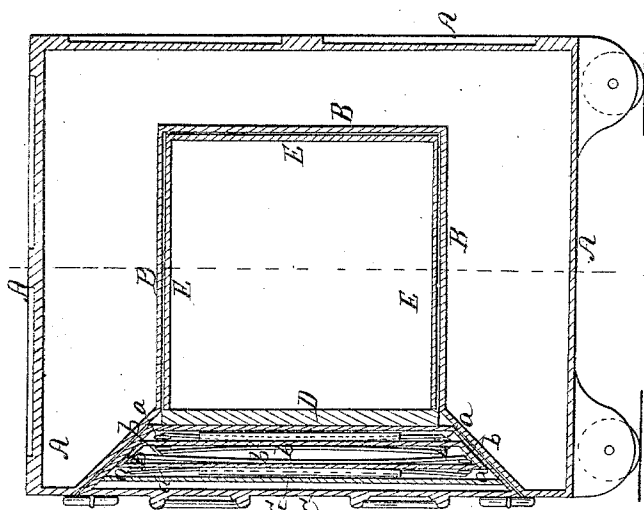


Fig. 3.

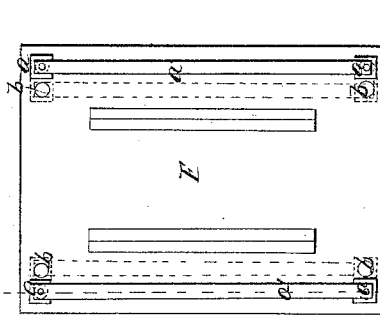


Fig. 10.

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H. H. BRYANT, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 79,808, dated July 14, 1868.

IMPROVEMENT IN FIRE-PROOF SAFES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, H. H. BRYANT, of Boston, in the county of Suffolk, and State of Massachusetts, have invented an Improvement in Fire-Proof Safes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a vertical section, taken from front to rear, through the centre of a fire-proof safe.

Figure 2 is a vertical transverse section through the safe.

Figures 3 and 4 show the construction of the water-vessels which are applied to the safe.

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

This invention relates to certain novel improvements on safes and other structures in which it is desired to preserve valuable property against destruction by fire, wherein water or other liquid is employed within the door and walls of such structures, for the purpose of preventing the place of deposit from becoming heated to such a degree as to injure anything contained therein.

In the construction of safes, or other structures of a similar nature, with water or other suitable liquid contained within their walls, it is very important to prevent the steam which is generated, during a fire, within the walls of the safes from communicating with the place of deposit, for, if this should occur, many valuable books and papers may be seriously injured or totally ruined. It is also important, in the construction of such safes, to provide for the escape of the steam, under a certain pressure, from the water-vessels, so as to prevent explosion, and to do this in whatever position the safe may be placed, or may assume, during the existence of a fire; also, to provide for the entrance of external air into said water-vessels, so as to prevent the creation of a vacuum therein by condensation of steam.

The nature of my invention consists—

First, in the combination of vessels adapted for containing a fluid suitable for generating steam with a safe which has its chamber of deposit made steam-tight against the steam which is generated from the water in said vessels.

Second, in the application, to a safe, or other fire-proof structure of a similar character, either in the first construction, or in the alteration of such a structure, of one or more fluid-containing vessels or chambers, which are provided with valves, which will allow the escape of the steam generated from the water in said vessel or vessels, whatever may be the position of the safe or structure during a fire.

Third, in the application of air-valves, arranged in the same manner as the steam-valves, (except that they open inwards,) to the said fluid-containing vessels.

Fourth, in filling a vessel, or other chamber used in a safe or fire-proof structure as a steam-generator, partly with water, and partly with an absorbent material, such, for instance, as plaster of Paris, say, the vessel to be half full of plaster of Paris, and half full of water, the two quantities filling the chamber. The plaster of Paris or other absorbent material having first been provided with all the water that it will absorb, the remaining space in the vessel or chamber is filled with water or steam-generating fluid.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In applying my invention to a safe made in the ordinary manner, I prefer to remove the filling used in the construction of the door, and substitute, in its stead, a case or frame of such form as will receive a vessel for holding water or other liquid suitable for generating steam. This case or frame should be of such construction, and so applied to the safe-door, that, when the door is closed, the door will shut against the edge of the case which encloses the space used as a place of deposit. The inner surface of said frame or door is covered with a sheet of cork, or any other yielding substance which will answer the desired purpose, viz, of making a tight joint when the door is closed, and hermetically sealing the space used as the place of deposit, so as to effectually preclude the entrance of steam into said space.

The invention is not confined to the exact mode of tightly closing the safe-door, nor to the material herein

mentioned, as various means and a variety of materials may be adopted with substantially the same result, viz, the exclusion of steam or vapor from the vault or place of deposit. It may be done without altering the ordinary safe-doors, by substituting other doors, properly constructed and adapted for the purpose, in place of the doors of the ordinary construction.

The vessels for containing a steam-generating liquid are provided with two sets of valves, one set being for the eduction of steam, and the other for the induction of air. The latter are used to prevent the vessels from collapsing by the external pressure of the atmosphere should the steam in said vessels be condensed. I prefer to use sixteen of these valves, eight of which will open outward, for the escape of steam, and eight will open inward, for the entrance of air under certain circumstances, placing one of each kind in the eight corners of each vessel. By the use of this number of valves, arranged as described, the vessels may be nearly filled with a liquid, and, when filled, they cannot be placed in such a position as will not leave one of each kind of the valves above the surface of the liquid contained in them.

It will be understood that the pressure of the steam, or that of the atmosphere, will act upon the valves which are above the surface of the liquid, so that none of the latter can escape through the action of either pressure upon the valves.

If the vessel is filled about three-fourths full, one-half the number of valves would answer the purpose, and the employment of only four of the valves would probably admit of the use of a sufficient quantity of liquid to resist the action of heat for a time long enough to preserve the deposits in the safe from loss.

The vessels are constructed in any suitable manner, and of any required form and size, and placed within the safe or vault in such manner as to afford the best protection to its contents. I then introduce a frame, that presents five sides of a steam-tight case, which serves to hold the liquid-vessels in place, and which also encloses five sides of a space to be used as the vault or place of deposit, the remaining side being closed by the door, as herein described.

In the accompanying drawings, A represents the outer wall of an ordinary safe or vault, and B represents the inner wall thereof. C is the safe-door, having a sheet of cork, D, applied on its inner face, so as to make a tight joint when the door is closed, and prevent the entrance of steam or vapor into the place of deposit.

Within the space enclosed by the walls of the safe is a casing, E, which is open in front only. On each side of this case, water-boxes, F F, are placed, as shown in fig. 2, which vessels have valves, *a a*, *b b*, applied at their corners, as shown in figs. 3 and 4. The valves *a a* allow steam to escape when the pressure thereof preponderates over the springs *a'*, which hold these valves to their seats, and the valves *b b* allow external air to rush into the vessels when the springs *b'* are unable to resist the external pressure, as above set forth.

Provision for the escape of the steam outside of the casings A B C may be made in any practical manner, either by vents, pipes, or other devices, if found necessary. A similar mode of providing for the supply of air to the chambers, from a point outside of the said casings, may be adopted. Whatever provision is made for these purposes, it should be such as will not interfere with the practical operation of the steam-generating vessels or chambers.

The safe-door C also contains a liquid-vessel, G, which is provided with two sets of valves, *a a* and *b b*, arranged so that they will operate, as described, for the valves of vessels F.

If the safe or vault had an established position, and was so fixed that it could not be disturbed by falling walls, or otherwise, during a fire, then two sets of valves, applied above the liquid in vessels F G, would answer every purpose desired. This, however, is not the case with portable safes; consequently, I apply such a number of valves to the several water-chambers that, in whatever position the safe may be placed, one of each kind of the valves will be in proper position for effective operation.

I do not confine my invention to the application of cork, or other suitable yielding substance, to the inner face of the safe-door, as I have shown in fig. 1, because the same result can be attained by applying a suitably-yielding substance to the jamb of the safe-door, or to the front face of the inside casing, forming the place of deposit.

Instead of employing water or other suitable liquid alone in the vessels F G, I have obtained very good results by employing a porous substance saturated with a liquid.

The mode of employing such porous substance, in combination with water or other steam-generating liquid, would be as follows: Take, for instance, sufficient plaster of Paris to fill one-half of the area of the chamber which is to contain it, supply this with all the water it will absorb, and afterwards fill the remaining space of the chamber or vessel with water or other suitable fluid.

The vessel for containing this combination of fluid and solid matter would have to be made air and water-tight, under ordinary pressure, to prevent evaporation or leakage, or be furnished with pipes, by which the requisite quantity of water would be supplied from time to time, as necessity requires. The chambers, under any circumstances, must have apertures or doors, through which the water may be introduced, such apertures or doors being constructed and fitted steam and water-tight; or, if not so constructed, the valve-apertures must be employed for this purpose.

Such a combination-filling as that just described will form a wall or lining for a safe that will resist the action of heat upon the deposits in the safe, so as to preserve them uninjured for a length of time as great as the usual duration of ordinary fires, and, in case the water should all become evaporated, the plaster of Paris would still, to a great extent, prevent a destruction of the contents of the safe.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of one or more vessels, adapted for containing a liquid suitable for generating steam, with a safe which has its chamber of deposit made steam-tight against the steam which is generated from the water in said vessels, substantially as and for the purpose herein described.

2. The arrangement of water or fluid-vessels with steam-valves, applied either within the door of the safe, or immediately around the receptacle E, or both within the door and around said receptacle, substantially as and for the purpose described.

3. Providing the water-vessels with air-valves, substantially in the manner and for the purpose described.

4. The combination of both air and steam-valves with the water-vessels applied to a safe, substantially as and for the purpose described.

5. The arrangement of the valves in or on the water-vessels or chambers in such a manner that some of the valves will operate, in whatever position the safe may assume during a fire, substantially as described.

6. The combination of water or other fluid with a solid absorbent substance, as a filling for a vessel or a chamber used in a safe or other similar fire-proof structure, substantially as and for the purpose described.

In witness whereof, I have hereunto set my hand, this 24th day of July, A. D. 1867.

H. H. BRYANT.

Witnesses:

J. DEAN BONNEY,

E. C. GRIFFITH.