(No Model.)

H. C. JOHNSON.

FIREPROOFING FOR SAFES, VAULTS, AND CHAMBERS.

No. 343,637. Patented June 15, 1886.

Fig. 1.

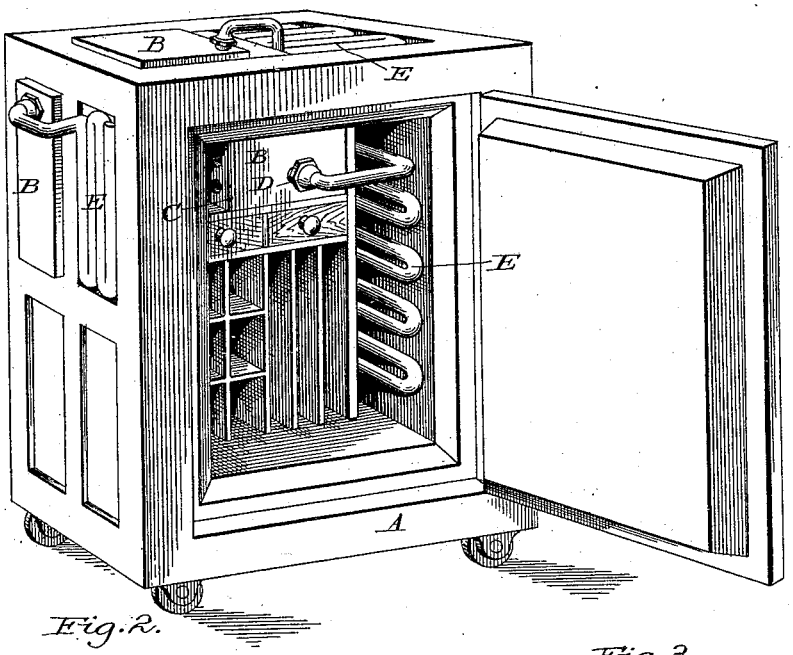


Fig. 2.

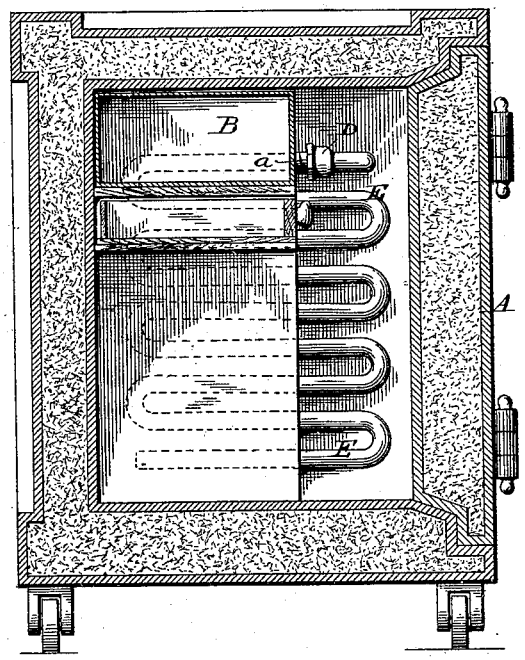


Fig. 3.

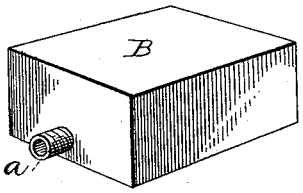
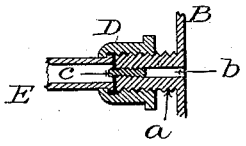


Fig. 4.



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UNITED STATES PATENT OFFICE.

HENRY CLAY JOHNSON, OF MEADVILLE, PENNSYLVANIA.

FIREPROOFING FOR SAFES, VAULTS, AND CHAMBERS.

SPECIFICATION forming part of Letters Patent No. 343,637, dated June 15, 1886.

Application filed March 30, 1886. Serial No. 197,170. (No model.)

To all whom it may concern:

Be it known that I, HENRY CLAY JOHNSON, of Meadville, in the county of Crawford and State of Pennsylvania, have invented certain new and useful Improvements in Fireproofing for Safes, Vaults, and Chambers, of which the following is a specification.

My invention relates to fireproofing for safes, vaults, and chambers; and it consists in certain improvements upon the structures patented to me July 18, 1882, and July 17, 1883, respectively numbered 261,461 and 281,514.

The present improvement consists in combining with the gas-holders a suitable expansion-pipe, whereby the absorption of heat by the expanding of gas may be more perfectly utilized and the action located; in making the gas-holder of rectangular form, whereby it may be placed within the safe or other chamber without waste of space, and in other features and details hereinafter explained.

In the drawings annexed, Figure 1 is a perspective view of a safe embodying my invention; Fig. 2, a sectional view of the same; Figs. 3 and 4, views illustrating certain details of construction.

In the practical application of the invention set forth in my aforesaid former patents, many points have been observed which suggest the more economical and beneficial application and utilization of the gas, together with convenience to the maker and user of the safe, vault, or chamber. Prominent among the points thus suggested is the combination, with the gas holder or holders, of an expansion tube, pipe, or body, in which the gas escaping from the holder may expand freely, but which shall in a measure confine and direct the gas, so that no part of the cooling effect may be wasted. The gas-holders may be placed both inside and outside, inside alone, or only on the outside, and the same is true of the expansion pipe or pipes.

I do not wish to be understood as claiming, broadly, the use of an expansion-pipe in connection with a gas-holder, as that is, of course, a well-known combination employed in a variety of ways; but I believe myself to be the first to combine such pipe with a gas-holder closed by a fusible seal and applied to a safe, vault, or chamber in such manner that in case of excessive heat about the chamber the gas shall be liberated without the intervention of human agency and caused to effectually cool the safe, so that it and its contents shall be and remain uninjured by the heat.

Referring again to the drawings, A indicates a safe, (or it may be a vault or other chamber,) the walls of which are ordinarily of iron, or iron and steel, and which may or may not be provided with non-conducting filling, as preferred. The interior arrangement of the safe may be varied, as desired; but for convenience for applying the gas-holder B to said interior it is preferred to make one compartment of a size and shape to receive it. Such a compartment is shown at C, being merely a pigeon-hole, the walls of which are advisably perforated or corrugated, to permit the air of the safe to circulate in contact with the walls of the holder, which become intensely cold as the gas within the holder expands to take the place of that escaping when the seal is broken. It is advisable to locate the pigeon-hole or chamber C at or near the top of the safe to avail the natural tendency of the cold air to descend, and thus establish a circulation of air within the safe or vault.

The gas-holder B may be of any desired form; but a rectangular shape will be found more convenient ordinarily, as the pigeon-holes are easiest made of that form, and in that shape accommodate the larger number or quantity of papers, such as are commonly placed therein. Each gas-holder is furnished with a neck, *a*, having a small hole or passage, *b*, for the gradual escape of the gas when said passage is open; but ordinarily the passage is closed by a fusible seal of any convenient form. In Fig. 4 this seal is represented as a plug, *c*, of fusible alloy screwed into the mouth of opening *b;* and the neck *a* is represented as threaded on its exterior to receive a coupling, D, by which to connect an expansion pipe, chamber, or coil, E. In practice a pipe-coil is preferred, as being cheap, easily made, and presenting large surface. The expansion-coil being of very much larger internal diameter than the outlet *a*, there is, of course, no danger of the coil being clogged by the fused or melted substance of the plug. For use within the safe

or vault a fusible alloy or substance having a very low fusion-point, comparatively speaking, should be used.

In the drawings I have also represented receivers or gas-holders outside the safe, placed with the paneled depressions thereof in a manner set forth in my Patent No. 281,514, and provided with the expansion pipe or coil E, in the same manner as when placed within the safe. The interior holder will preferably be made to discharge within and the external holders to discharge the gas outside of the safe, vault, or chamber; but it may in some cases be found expedient to carry the coil-pipe through the walls from the inside to the outside, or from the outside to the inside, the holders themselves serving in all cases as coolers or heat-absorbing bodies, as well as the expansion coil or chamber.

In practice any suitable gas may be employed, and good results may also be attained by the use of atmospheric air; but because of its effect upon combustion I prefer to use carbonic-acid gas, which is to be compressed to liquefaction or to a suitable high degree short thereof.

In all cases I propose to make the coil or expansion-chamber detachable from the gas-holder, and to make the holder portable and readily removable, in order that when its contents are in whole or in part exhausted they may be renewed or a filled holder substituted for an unfilled one.

The expansion-chamber may be merely a thin flat vessel, and I prefer to form it of sheet-copper, because of the conductivity of such metal, its non-corroding property, and its strength.

Instead of the particular form of seal shown and described, I may use those shown in either of my former patents, or any equivalent thereof.

The coils or expansion-chambers may be either fixed or removable, and are furnished with a suitable coupling for connection with the gas-holders.

It is important that the gas be allowed to freely escape after circulating through the expansion-chamber, in order that its effects may be made available in preventing combustion.

Instead of corrugating the sides of the space in which the gas-holder is placed, the holder may be thus corrugated.

I am aware that it has been proposed to place within the walls of a safe or vault gas-holders containing poisonous gases destructive of life and preventive of combustion, the pipes and outlets of such holders to be sealed with fusible plugs. In such prior construction, however, it was proposed to place the gas-holders and their pipes within or to surround them by fire-proof filling, whereas my invention contemplates, and its efficiency depends upon, the surface of the holder and pipes being exposed, so as to utilize the cooling-surfaces and effect a rapid absorption of the heat in case of fire.

Having thus described my invention, what I claim is—

1. A vault, safe, or chamber provided with a holder containing gas or air under high compression, a fusible seal therefor, and an exposed or uncovered expansion pipe or chamber communicating with the outlet-passage of the holder, all substantially as described and shown.

2. In combination with a safe, vault, or chamber, a holder for compressed gas or air provided with a fusible seal, an expansion coil or chamber, and a coupling for connecting and disconnecting the expansion coil or chamber and the holder.

3. In combination with an expansion coil or chamber provided with a coupling, a gas-holder provided with a neck threaded internally and externally to receive the fusible plug or seal within, and the coupling of the expansion coil or chamber without.

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