

A. L. STIMSON.
Vaults, Safes, &c.

No. 156,261.

Patented Oct. 27, 1874.

Fig. 1.

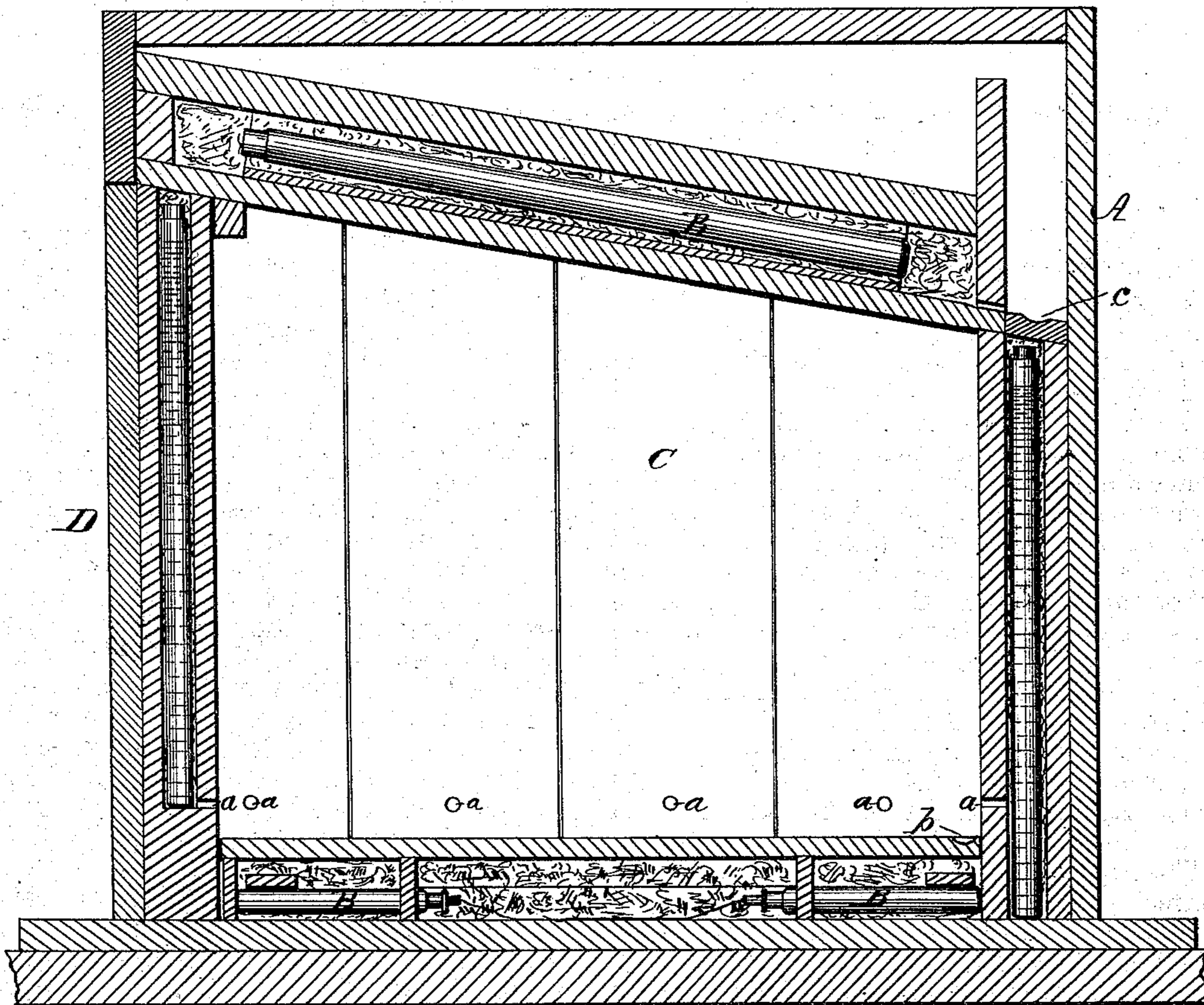
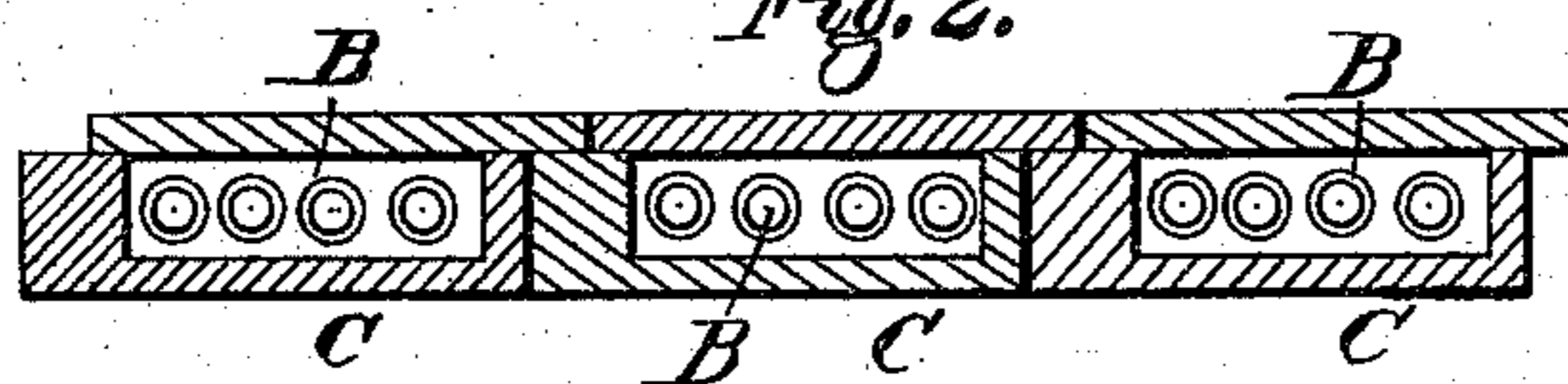


Fig. 2.



Witnesses:

G. H. Dodge
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UNITED STATES PATENT OFFICE

ALEXANDER L. STIMSON, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN VAULTS, SAFES, &c.

Specification forming part of Letters Patent No. **156,261**, dated October 27, 1874; application filed July 18, 1874.

To all whom it may concern:

Be it known that I, ALEXANDER L. STIMSON, of Chicago, in the county of Cook and State of Illinois, have invented certain Improvements in Vaults, Safes, &c., of which the following is a specification:

My invention consists of a vault for the safe keeping of papers or other valuables, having concealed in its walls, in tubes or other receptacles, an acid, so arranged that the penetration of the walls will release the acid, and cause it to come in contact with an alkali or other suitable chemical, and thereby generate a gas, the object being to render the vault and its contents more secure against burglars and fire, as hereinafter more fully explained.

Figure 1 is a longitudinal vertical section of a vault having my improved armor; and Fig. 2 is a cross-section of a portion of the inner casing, which forms the acid-chamber in my improved vault.

The object of my invention is to secure more perfect protection of bank vaults and safes against burglars; and it consists primarily in providing the walls, floors, and ceilings of the same with suitable chambers C or recesses, in which are placed glass tubes or other suitable receptacles B, partially filled with sulphuric acid, as shown in Fig. 1.

These tubes or receptacles are packed in bicarbonate of soda, chalk, marble-dust, or similar substance, which serves to prevent them from moving about, and which, when acted upon by the acid, will produce carbonic-acid gas, the tubes being placed so near to each other as to render it impossible for a burglar to make a hole of sufficient size to admit his body without demolishing several of the acid-tubes, and thus allowing the acid to escape, and, coming into contact with the bicarbonate of soda or similar material, to produce carbonic-acid gas, which will kill the burglar, or at least render him unable to do any damage.

In the drawing I have shown my improvement as applied to a vault such as are now in use, except that I dispense with the costly steel lining now used.

A represents the ordinary wall of masonry, inside of which I place the acid-chamber C,

extending over the floor, ceiling, and all the sides, except that on which the doors are placed. This chamber C may be made of metal, formed in sections, as shown in Fig. 2, and bolted or otherwise fastened together; or it may be made of masonry, concrete, plaster-of-paris, or any other suitable material. The top may be inclined like an ordinary shed-roof, or it may be arched. When inclined, as shown in Fig. 1, the tubes are laid lengthwise of the incline. At the lower end of the inclined roof is a gutter, *c*, into which the acid runs when the tubes B are broken, and from here it passes down through openings in the acid-chamber, and out through holes *a* at the lower end of the same into the interior of the vault, and runs along a gutter, *b*, in the floor of the same. If it is desired to have the gas form slowly, but for a long time, in order to keep the vault filled long enough to overcome the burglar, this gutter *b* may be filled with marble-dust or chalk, which are not so readily acted upon by the acid as the bicarbonate of soda; but, as the carbonic-acid gas is heavier than the air, it will pass down through the casing C, and through the openings *a*, into the interior of the vault.

As the carbonic-acid gas has no effect upon written matter, the papers contained in the vault cannot be injured by it, and hence there can be no objection to its use on this ground.

In providing the floor with my improved armor, I mount two rows of bottles or tubes in a frame, one row at each end, as shown in Fig. 1, they being placed with their stoppers toward each other, and each stopper having attached to it a strong wire, rod, or cord. These wires or cords are securely fastened to the bricks or stones forming the floor on which the vault is built, and are so arranged that when the burglar, in attempting to enter through the floor, pulls at the stones or bricks, unwittingly draws out the stoppers of the bottles or tubes. The tubes or bottles in the floor are placed between the floor of the vault and the floor on which the vault rests, as shown in Fig. 1, and may be packed in bicarbonate of soda or similar material, or not, as desired. When not packed in the bicarbonate of soda, the intention is to have the

acid run out through the opening made by the burglar onto him, which will cause him to suspend operations.

It being impracticable to place the acid-receptacles in the door of the safe or vault, on account of their being in the way when it is necessary to change the combination on the locks, or to oil the bolts of the same, besides making the doors too heavy, I hinge a separate set of doors, provided with the acid-chambers, inside of the doors of the vault or safe proper.

By this means I am enabled to protect the safe or vault entirely against burglars; but, as the acid expands when heated, it is necessary to provide against damage by accidental discharge of the acid-receptacles. This may be done in a variety of ways, the simplest of which is to fill the receptacle only partially full of acid; and as an additional safeguard against accident from this source I place the acid-receptacles each inside of a larger casing, leaving space between them.

There can be no danger of accident to the custodian, as when the gas has been formed its odor will be sufficient to warn him of danger, and he will then give the gas an opportunity to escape through open doors and windows.

The acid-receptacles may be made of any form or material, but I prefer the use of glass tubes, as being best suited to the purpose.

While the primary idea of my invention is to afford protection against burglars, it will also afford protection to the contents of the vault against fire; as, in case of the burning of the building, there will be a generation of the gas as soon as the walls of the vault are sufficiently heated to crack the glass tubes, or to fuse the leaden ones, in case lead be used; and as a large amount of gas will be formed, and its formation will continue for a considerable time, it is evident that it will either extinguish the fire completely in the vicinity of the vault or at least tend greatly to protect the contents of the vault from injury by the fire.

It is sometimes customary to build large safes, to be placed within vaults, and where this is done, it is obvious that my invention may be applied to the walls of the safe itself, so that whenever an attempt is made by drilling, or otherwise, to break into the safe, the acid-tubes will be fractured, and the gas formed thereby will flow out into the vault, thereby expelling the burglars.

It is often customary, in large buildings intended for office use, to build a series of vaults, one over another, thus furnishing a vault for several, or all of the stories of the building;

and in such cases it is the common practice of burglars to break through from above, and work down from one to another, without disturbing the side walls or doors. In all such cases, where my improvement is applied, the protection will be most complete, because the gas, being heavier than the air, will at once fill the vault, displacing the lighter air, thus rendering it impossible for the burglars to operate therein; and this it will continue to do down through any number of stories or vaults, even though the side walls be not disturbed, as the making of a hole through the top of sufficient size for a burglar to enter will release sufficient acid to generate enough gas to fill the vault, and this will be repeated as each floor or ceiling is penetrated; and even if the gas-producing elements are stored only in the top, and not in the floor of each separate vault, the gas will pass down into the vault or compartment below as soon as an opening is made; though I prefer in all cases to have the several rooms or compartments, however arranged or located, fully protected by placing the gas-generating elements on all sides, and above and below, so that an entrance cannot be effected by any means without liberating the acid and generating the gas.

I am aware that a patent has been granted for the employment in safes of highly compressed or liquefied poisonous gases; but such a plan is not practicable, for the reason that the great pressure exerted by the poisonous gases will always tend to create leaks in the vessels containing them, thereby endangering the lives of persons occupying the room where the same is used, and causing the gases to gradually escape, and thereby depriving the safe of the means intended for its protection.

I do not claim the use of compressed or liquefied gases; but

What I do claim is—

1. A vault, having located within its walls, tubes, or vessels, containing acids, together with alkalies or other suitable substances for the generation of gases, said substances being so arranged as to remain inert until disturbed, but so as to be brought in contact by any breaking or penetration of the walls of said vault, substantially as and for the purpose set forth.

2. A vault, having located within its walls a series of tubes or vessels containing acids, and provided with openings and conduits for conveying said acids to the alkalies or other suitable chemicals located at other points within the walls, substantially as herein set forth.

ALEX. L. STIMSON.

Witnesses:

CHARLES S. SWEET,
WILLIAM H. MOORE.