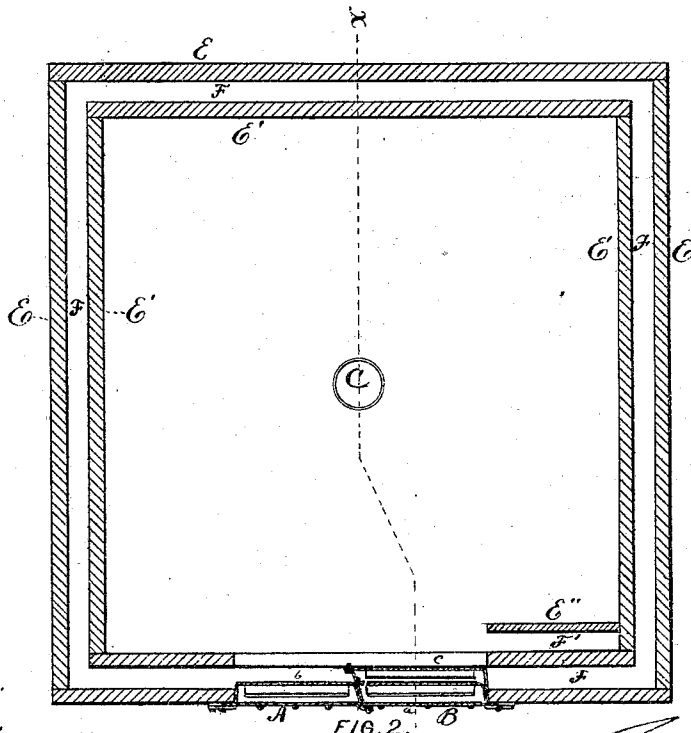
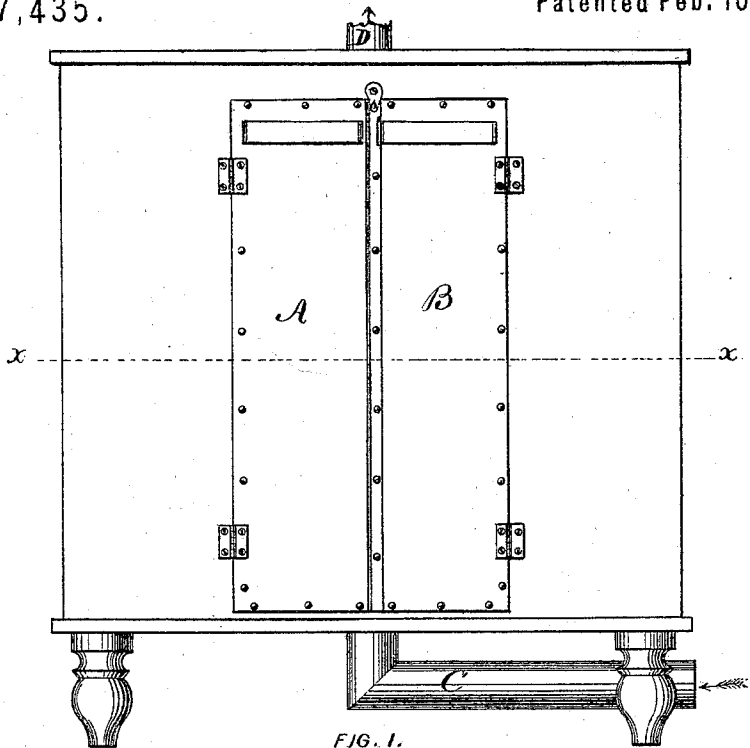


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Fire-Proof Construction for Vaults.

No. 147,435.

Patented Feb. 10, 1874.



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William Standish

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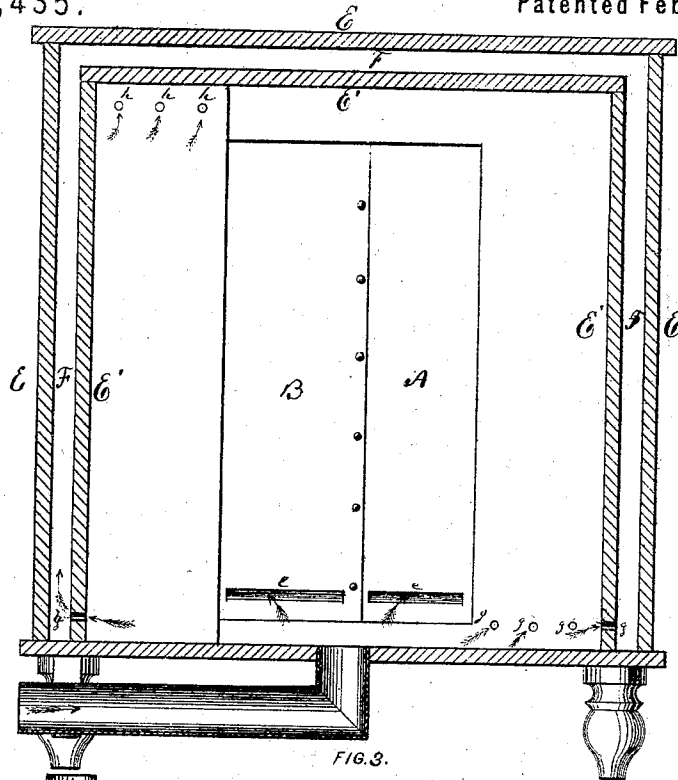


FIG. 3.

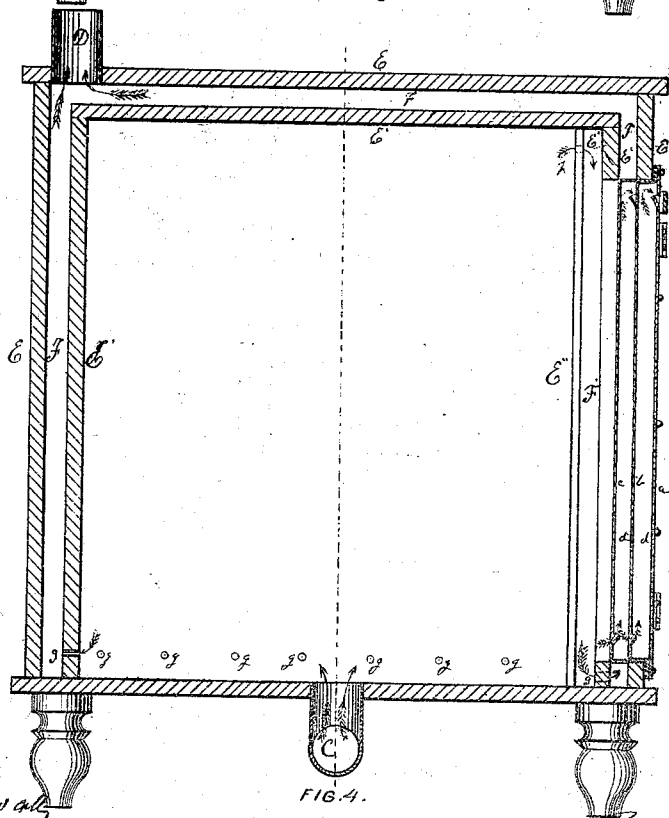


FIG. 4.

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UNITED STATES PATENT OFFICE.

CHARLES H. SCHNELLE, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN FIRE-PROOF CONSTRUCTION FOR VAULTS.

Specification forming part of Letters Patent No. **147,435**, dated February 10, 1874; application filed November 29, 1871.

To all whom it may concern:

Be it known that I, CHARLES H. SCHNELLE, of the city and county of St. Louis, State of Missouri, have invented a certain Improvement in Fire-Proof Construction for Vaults, &c., of which the following is a specification:

My invention consists in a mode of constructing safes and vaults in such a manner as substantially to protect them from taking fire from without; and it relates to that mode of construction in which an air-chamber is made between the walls. It consists, chiefly, in so constructing and arranging the walls and air-chambers that heating any part of the walls will cause a current of cold air to pass through the adjoining chamber so long as the heat continues. This current of air will keep the inner walls at a temperature far below the point of combustion. I take care to build the walls as much as possible out of contact with each other, save such contact as is necessary to preserve their relations and give requisite strength and support. I endeavor to secure a free circulation of air throughout every part of the space between the walls. The first part of my invention consists in a provision for securing this circulation of air. To do this, I make an orifice near the bottom of the inner wall and near the top of the outer wall (where but two walls and one chamber are made.) As the outer wall becomes heated, the air of the chamber becomes rarefied, rises, and passes out through the orifice at the top of the said wall, and at the same time the cool air from the inside of the chamber will pass through the orifice in the bottom of the inner wall, to supply the place of that which has thus risen and passed off. The second part of my invention consists in the means adopted for introducing cool air into the inside of the safe or vault from the outside. This is done by means of a common pipe or box opening at any point outside and leading into the interior of the safe or vault. This pipe must be protected, and conducted according to the location of the place to be protected; but in all cases care must be taken that there be no impediment to the passage of the air in sufficient volume.

I have illustrated and explained my invention by a drawing of a safe constructed according to my plan. In the safe one side of the

front is made with two, and one with one, air-chamber.

Figure 1 is a view of the safe with the doors closed. Fig. 2 is a horizontal section in the line *xx*, Fig. 1. Fig. 3 is a vertical section, showing the inside of the front part with the doors closed. Fig. 4 is a vertical section on the line *xx*, Fig. 2, with the doors closed, showing the inside of the right-hand section.

C is a pipe or tube leading from the outside and entering the bottom of the safe, to supply a current of cold air to the air-chambers as it is needed. Said pipe must be of dimensions proportioned to the capacities of said chambers. It may be opened to the outer air at any convenient place; but the outer opening should be so placed that hot air will not enter the safe or room in case of conflagration. If the safe or room to be protected is large, I then conduct the outdoor air to the top of the inside, so as to keep the whole surface of the inner wall cool. D is the escape-pipe, passing through the top of the safe, on the outside, into the air-chambers between the walls. This must be extended or in some way connected with the outer air, so as to allow free passage for the current of air from the inside of the chambers. If my plan is adopted in the construction of a house or other larger building, provision should be made for the escape of the heated air from the chambers at the top of the walls, either by having the chambers open there, or providing suitable orifices. E E' E'' are the outer, middle, and inner walls of the safe, inclosing the air-chambers F F'. These chambers should occupy as much of the area of the walls as possible consistent with strength, and should be of a depth proportionate to the area and height of the walls, it being necessary to provide for the passage of a volume of air too great to be heated on its passage upward. *g g* are orifices through the lower part of the inner walls of the safe, through which the air passes from the safe into the chambers F F'. *h h* are air-passages in the upper part of the said inner wall, which I recommend, when three walls are built, in the place of the air-passages *g g* at the bottom of said wall. In cases where the area of the wall is large, and especially where it is high, and there are three walls, I find it best to make orifices all over the inner wall, and

thus establish a circulating current all through the inner chamber.

When the outer walls of the safe become heated, the air in the chamber beneath becomes rarefied, and rises and passes out through the pipe D; the cool air from the inside passes into the chamber at the bottom, to supply the place; and the air from outdoors rushes into the chamber or safe through the pipe C, or other passage, to supply the partial vacuum thus created. A current of outdoor air is thus established in the air-chamber, which will continue as long as the heat lasts and the supply is uninterrupted, and will increase as the heat increases in velocity and volume. This current of air will keep the temperature below the point of combustion. When large structures are made upon this plan, I admit the air into the air-chambers from the cellar by proper openings; but, as the main purpose is to insure a free circulation through the air-chambers, any means may be used to accomplish it, provided the

supply of cool air is admitted to or passes up from near the bottom of the outer chamber, and escapes at or near the top.

I claim as my invention—

1. The combination of air-chambers between the walls of buildings or vaults with an air-tube extending from the interior to the external air, and one or more orifices near the bottom of the inner wall opening from said interior into said air-chamber, and one or more orifices in the outer wall opening near the top of said chamber and connected with the outer air.

2. The combination of inlet-pipe C and exit-pipe D with one or more air-chambers, F, and orifices for the passage of air, arranged to operate substantially as set forth.

CHAS. H. SCHNELLE.

Witnesses:

WM. ASPINWALL,
WILLIAM STANDISH.