J. E. DAVIS.

FIREPROOFING FOR SAFES AND VAULT DOORS.

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981,247. Patented Jan. 10, 1911.

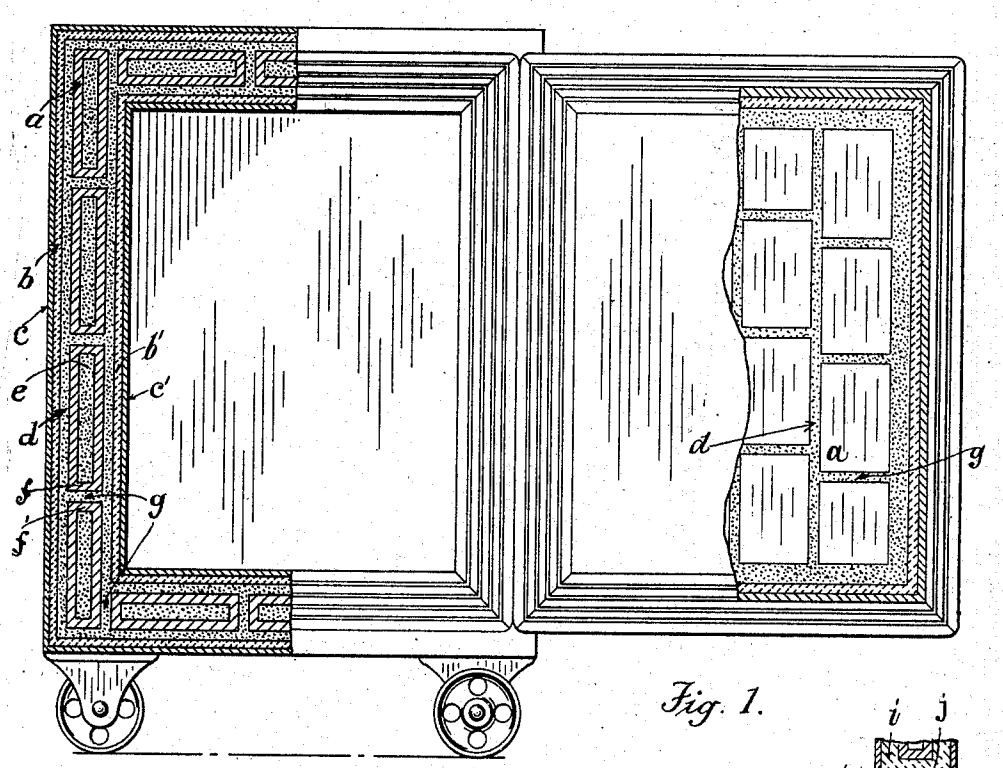

Fig. 1.

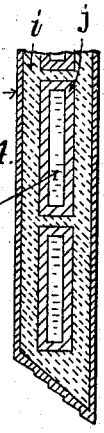

Fig. 4.

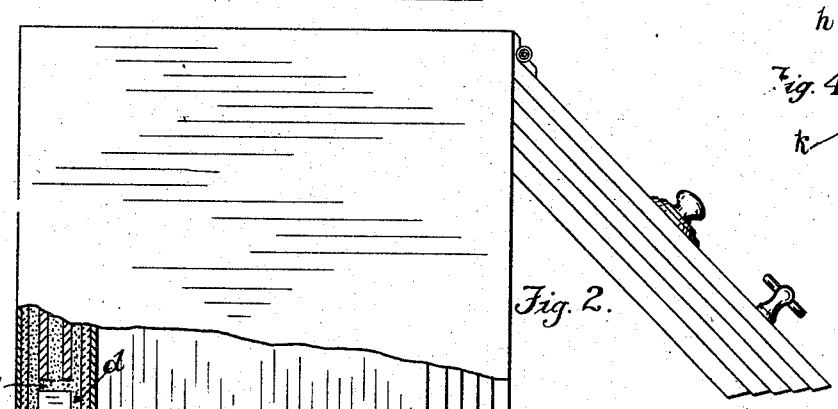

Fig. 2.

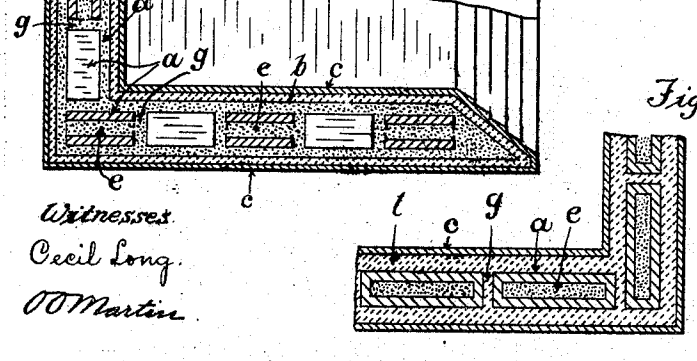

Fig. 3.

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UNITED STATES PATENT OFFICE.

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FIREPROOFING FOR SAFES AND VAULT DOORS.

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To all whom it may concern:

Be it known that I, JOHN E. DAVIS, a citizen of the United States, and a resident of Portland, in the county of Multnomah and State of Oregon, have invented a new and useful Improvement in Fireproofing for Safes and Vault-Doors, of which the following is a specification, reference being had to the accompanying drawings as constituting a part thereof.

My invention has for its object to obtain a fire-proof safe, the fire-proofing of which is so made as not to have its efficiency destroyed by a fall of the safe with the collapsing of a burning building, nor by being exposed to extreme temperatures; in short to provide a fire-proof filling for safes which shall retain its effectiveness as long as the frame of the safe holds together.

My invention is also applica- doors, as apparent from the following description.

In the drawings: Figure 1 shows a front elevation of a safe with the door thereof open, parts being in section; Fig. 2 is a top view of my safe with the door opened and a part of the body of the safe being shown in horizontal section; Fig. 3 is a vertical section of a corner of the safe body, illustrating a different mode of arrangement and construction of my fire-proof filling; and Fig. 4 is a partial vertical section of a door illustrating another mode in which my invention may be carried out.

In the construction of fire-proof safes, hydraulic cement was generally used as the fire-proofing material, but such filling, when exposed to intense heat, generates steam, which was formerly deemed a desirable property of the cement, but now is not so considered because the steam affects the mechanical structure of the books contained in the safes, and frequently renders the books useless or renders them illegible. The steam emitted from such fire-proof filling is also known to melt soft solder, and to so badly tarnish jewelry as to render it practically unfit for further use. A hydraulic cement filling is also affected by climatic conditions which may cause expansion, to allow for which the door of the safe containing such filling cannot be fitted closely; but this, on the other hand, allows heat and water to enter around the edges of the door, when the safe is exposed in a fire. The filling invented by me, however, permits me to make the door practically absolutely tight, for my fire-proof filling is not in any wise affected by climatic conditions or heat.

Referring now to the details of construction of my fire-proof filling as illustrated in Fig. 1: *a* represents hollow terra cotta tiling, either of the "dense" or the "porous" kind, embedded in a mineral material capable of resisting high temperatures. I prefer to use for such purpose diatomaceous silicate, or infusorial earth, which is a non-conductor of, and indestructible by, heat.

The terra cotta tiling is selected from one of the kinds referred to, both being commonly used for building purposes, and representing a four-sided shell-like structure having a central cavity or air space. This tiling, as shown in the drawing, occupies the central part of the space between the inner and outer walls *c*, *c'* of the shell and frame of the safe, and is likewise arranged in the door. The inner faces of the metal shell *c*, *c'* of the body of the safe may be lined by a monolithic facing of cement *b*, *b'*. When mentioning cement, I mean hydraulic cement, commonly used in the building art, being introduced in a plastic state and set or hardened into a stone-like mass, as usual. It is generally convenient to arrange the tiling end to end (*f*, *f'*) and separate such ends by an intermediate layer of the embedding material *g*, which in Fig. 1 is represented as being diatomaceous silicate. The air confined in a hollow space of the terra cotta tiling would, as well known, act as a heat-retarder, but I prefer to fill such hollow space with the diatomaceous silicate, as shown by *e*. The different kinds of material referred to are chosen and arranged by me, as described, to promote the fire-resisting property of the filling of my safe.

When the filling has been constructed as just above described, the following beneficial results are obtained: The tiling, by reason of being embedded in, and filled with, the pulverized silicate, though it be fractured or shattered by the fall of the safe with the collapsing of the floor on which it stands, it will, nevertheless, be maintained in an effective state, for the crevices caused by the fractures will become filled and closed up by the pulverized mineral material within the hollow of and surrounding the tiling.

The construction and arrangement of the filling for the door of the safe is substantially the same as that of the body.

In the illustration of my improvement in Fig. 3, the following differences are to be noted: The described interior cement facing, *b*, *b'*, and embedding pulverized mineral material, *d*, *g*, are omitted, and in place thereof the spaces between the shell of the safe body, and the outer faces of the tiling, also the spaces between the ends of the tiling, are filled with a solid or monolithic form of cement. The filling, *e*, of pulverized mineral material, within the hollow of the tiling, *a*, is retained.

The mode of construction of my filling illustrated in Fig. 4 is substantially the same as that illustrated in Fig. 3; *h* representing the shell of a door, *i* a monolithic mass of cement incasin gthe hollow tiling *j*; but a filling for the hollow *k* of the tiling is omitted, and the cement wall, *i*, is depended upon for holding the tiling in place, at the time the safe is subjected to a fall. The disadvantage of a more or less monolithic filing is, that in case the fall of the safe should be so great as to shatter the cement wall portion, *i*, of the filling, it might leave a space in the fracture of the filling, between the walls of the shell *h*, through which the intense heat could penetrate, and thus the fire-resisting quality of the filling would be deteriorated.

As a general rule, I would state that the construction of my filling as illustrated in Figs. 1 and 2 represent the best mode. Besides the advantages mentioned, it also materially reduces the weight of the filling, and this, manifestly, is an item, because it directly affects and reduces the cost of transportation, and incidentally reduces the selling price.

I claim:

1. A fire-proofing comprising a body consisting of a shell, hollow terra cotta tiling arranged centrally within the shell of the body, embedded in pulverized mineral material, and a filling of mineral material in the hollow of the tiling.

2. A fire proofing comprising a body consisting of a shell, hollow terra cotta tiling arranged centrally within the shell of the body, embedded in pulverized mineral material, and a filling of diatomaceous silicate in the hollow of the tiling.

3. A fire-proofing comprising a body consisting of a shell, an inner facing thereon of monolithic cement, hollow terra cotta tiling arranged centrally within the shell of the body, embedded in pulverized mineral material, said tiling being arranged end to end spaced apart, and the intermediate space also filled with mineral material, and a filling of pulverized mineral material in the hollow of the tiling.

4. A fire-proofing comprising a body consisting of a shell, an inner facing thereon of monolithic cement, hollow terra cotta tiling arranged centrally within the shell of the body, embedded in mineral material, said tiling being arranged end to end spaced apart, and the intermediate space also filled with mineral material, and a filling of diatomaceous silicate in the hollow of the tiling.

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