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W. H. & E. C. HALL.

FIREPROOF SAFE AND PROCESS OF FILLING THE WALLS OF THE SAME.

APPLICATION FILED FEB. 21, 1905.

Fig. 1.

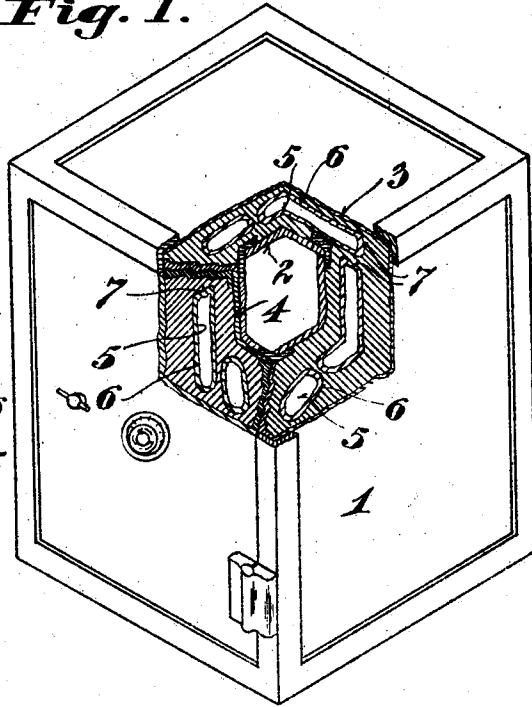


Fig. 2.

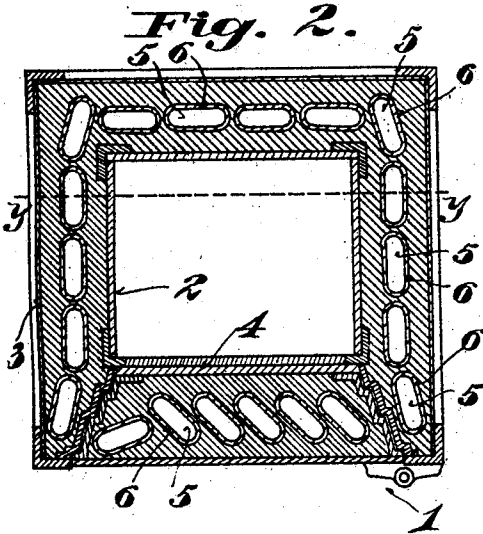


Fig. 3.

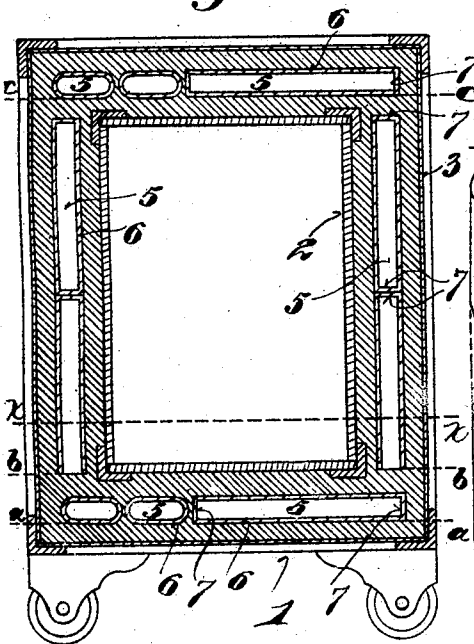


Fig. 5.

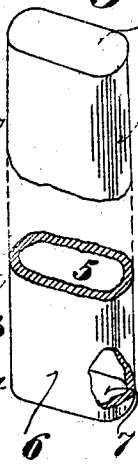
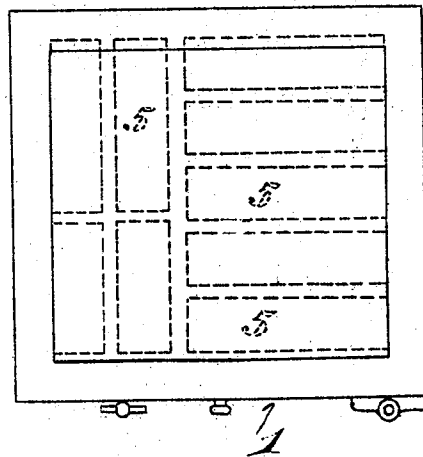


Fig. 4.



Witnesses.

Henry K. Bauer  
John B. Schwig

Inventors.

William H. Hall  
Edward C. Hall  
By A. H. Dabell, Attorney

# UNITED STATES PATENT OFFICE.

WILLIAM H. HALL, OF GLENDALE, AND EDWARD C. HALL, OF CINCINNATI, OHIO.

FIREPROOF SAFE AND PROCESS OF FILLING THE WALLS OF THE SAME.

No. 816,724.

Specification of Letters Patent.

Patented April 3, 1906.

Application filed February 21, 1905. Serial No. 246,742.

*To all whom it may concern:*

Be it known that we, WILLIAM H. HALL, residing at Glendale, and EDWARD C. HALL, residing at Cincinnati, in the county of Hamilton and State of Ohio, citizens of the United States, have jointly invented certain new and useful Improvements in Fireproof Safes and Processes of Filling the Walls of the Same, of which the following is a specification.

It has heretofore been the experience of safe manufacturers that in fireproof safes having cement or similarly filled walls, especially in the thick-walled safes of that character, the walls have expanded after manufacture, resulting in bulging of the wall-plates and consequent injury to the safe. This expansion or bulging has at times taken place immediately after manufacture, but usually at varying longer periods after manufacture ranging to six and eight months and at times a year or more, so that upon shipment of a safe the manufacturer could not be certain whether the safe would retain its shape, and safes being so heavy and bulky and the cost of shipment and hauling so great serious damage has resulted to the manufacturer from necessity of repair or replacement and loss of prestige with the trade.

Safes of the character mentioned have heretofore had their walls and doors filled with hydraulic cement or similar composition, which upon setting forms a solid hardened filling mass for the interspaces of the walls and door. After completion of the safe further action has taken place in this mass, which it is believed is chemical in its nature, resulting, however, in the expansion or bulging stated.

It is the object of our invention to remedy this difficulty.

Our invention has the further object of providing a safe which for a given bulk shall be lighter in weight, have its fire-resisting capacity increased, and the tendency of the condensation of moisture or presence of dampness in its interior reduced.

Our invention consists in providing the filling for the interspaces of the safe with spaces or cavities for relieving the walls of said interspaces from undue outward pressure, in novel process for providing said filling with spaces or cavities, and in carrying out our invention we prefer to previously

form suitable hollow bodies and suitably dispose them in the filling so that said hollow bodies may form said spaces or cavities, and the invention will be readily understood from the following description and claims and from the drawings, in which—

Figure 1 is a perspective view of a safe partly broken away for showing our improved construction. Fig. 2 is a horizontal cross-section taken on a line corresponding to the line  $xx$  of Fig. 3. Fig. 3 is a vertical section of our improved device, taken on a line corresponding to the line  $yy$  of Fig. 2. Fig. 4 is a plan view of a safe, showing the cavities in its top in dotted lines. Fig. 5 is a perspective view, partly broken away, showing one of the hollow bodies of an advisable form used in carrying out our invention.

The safe is shown at 1, the skeleton of which comprises an inner casing 2 and an outer casing 3, with a door 4 forming a closure therefor, the door being hollow in its skeleton form. In fireproof-safe construction the skeleton and the door-frame are usually of metal, such as sheet iron or steel plate suitably braced or connected, and for the purpose of our invention may be of any suitable form, size, or style. The casings form walls between which our improvement is located, forming walls containing our improvement.

In fireproofing safes it has heretofore been a usual practice to fill the interspaces or hollows between the casings and of the door with a hydraulic cement or concrete in a solid mass throughout, resulting in the objections stated. We provide spaces or cavities 5 within the filling material, preferably in the following manner: Hollow bodies are first formed. These hollow bodies may be of any suitable form and material and are suitably disposed in the fireproof material of the safe. We have shown these hollow bodies, or, as they may be termed, "envelops" for the spaces or cavities in the filling of the safe, in the form of flattened tubes 6, having one or more closed ends 7. We prefer to construct them of material similar to the fireproof filling of the safe—for instance, fireproof cement or concrete, which is a composition well known in the trade and usually consists of five parts, in measure, of hydraulic cement, one part, in measure, of sand, and four parts, in measure, of water, which proportions may,

however, be varied or the sand omitted, or substances producing similar effects may be employed. The bodies or envelops are preferably molded while the composition is still wet or plastic and then permitted to dry sufficiently to permit their introduction into and the further filling of said interspaces while said bodies or envelops retain their general shape. We prefer to air-dry said bodies before their introduction into said interspaces. After the introduction of said bodies into the fireproof interspaces of the safe the portions of said interspaces remaining unfilled are filled with said fireproof filling and the whole permitted to dry, thereby forming a fireproof filling provided with spaces or cavities. The space-envelops are preferably porous for absorbing moisture from the filling thereabout and becoming bonded therewith for forming a homogeneous mass.

As an exemplification of the manner in which a safe may be fireproofed by our improved process it may be stated that the bottom wall of the interspace may be provided with a layer of said fireproof filling in wet or plastic state to the dotted line *a* of Fig. 3, the space-envelops then placed thereon in drier state, and filling material in wet or plastic state filled thereabout to the dotted line *b*. The space-envelops may then be set thereabove and the interspace filled with wet or plastic filling material to the dotted line *c*, when other space-envelops may be laid thereon and the balance of the interspace filled with the wet or plastic filling material and the top plate of the safe then secured in place. The door may be filled in similar manner, preferably first laying the same upon its side. In our improved process and construction if expanding action takes place in said fireproof filling it is expanded in said spaces or cavities without detrimentally affecting the plates of the safe, said spaces or cavities relieving the pressure between said plates, the cavities and the envelops affording less resistance to the expanding action than the skeleton of the safe and the safe retaining its shape irrespective of the action taking place within its walls. If, for instance, chemical action should take place in the fireproof cement or concrete filling due to the presence of unslaked lime or other cause, the said filling being slightly porous, the gases created will follow the course of least resistance—namely, to the cavities—and expanding of the filling itself will also follow the course of least resistance—namely, in the cavities—in-

stead of, as heretofore, bulging the safe-plates. Our improvement also lightens the safe and increases its fire-resisting qualities by providing air-spaces within the body of the fireproof filling. Our invention further minimizes the condensation of moisture or dampness in the interior of the safe, due to the difference in temperature between the interior and exterior of the safe often prevalent, by providing air-spaces within the walls of the safe.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a fireproof safe, the combination with an inner casing and an outer casing forming interspace therebetween, and fireproof filling for said interspace, said fireproof filling containing previously-formed collapsible hollow bodies embedded in and forming homogeneous mass with said filling, substantially as described.

2. In a fireproof safe, the combination with an inner casing and an outer casing forming interspace therebetween, and cement filling for said interspace, said filling containing previously-formed hollow cement bodies embedded in and forming homogeneous mass with said filling, substantially as described.

3. The process of filling the interspace of a safe which consists in forming bodies having cavities, and then embedding said bodies in the filling for said interspace, said bodies being drier than said filling when embedded therein, and said bodies and filling being of homogeneous composition for forming a homogeneous mass when said filling is set, substantially as described.

4. The process of filling the walls of a safe which consists in forming hollow hydraulic cement bodies, permitting the same to dry, and then embedding the same in said walls in a hydraulic-cement filling while the latter is in wet state, whereby moisture from said filling is absorbed by said hollow bodies, and then permitting said filling and bodies to dry, whereby said filling and bodies form a homogeneous mass, substantially as described.

In testimony whereof we have signed our names hereto in the presence of two subscribing witnesses.

WILLIAM H. HALL.  
EDWARD C. HALL.

Witnesses:

HENRY N. BAUER,  
AUGUST F. HERBSLEB.