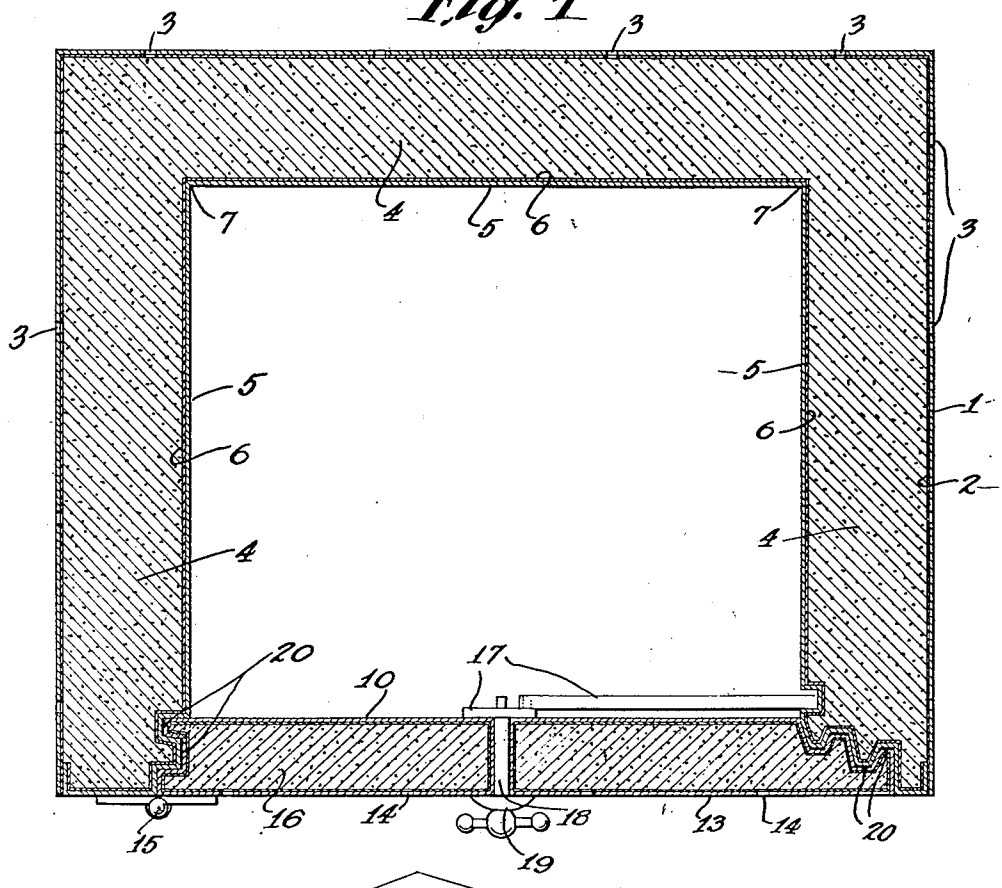
March 4, 1930. E. S. MERRIAM 1,749,222

HEAT RESISTING CABINET

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Fig. 1



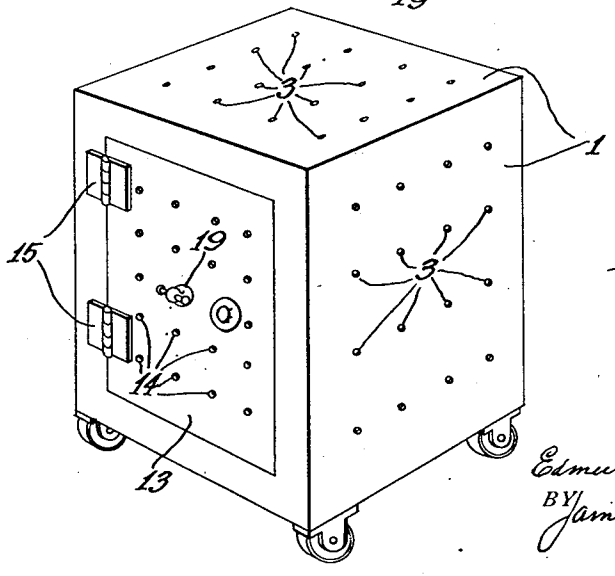


Fig. 2

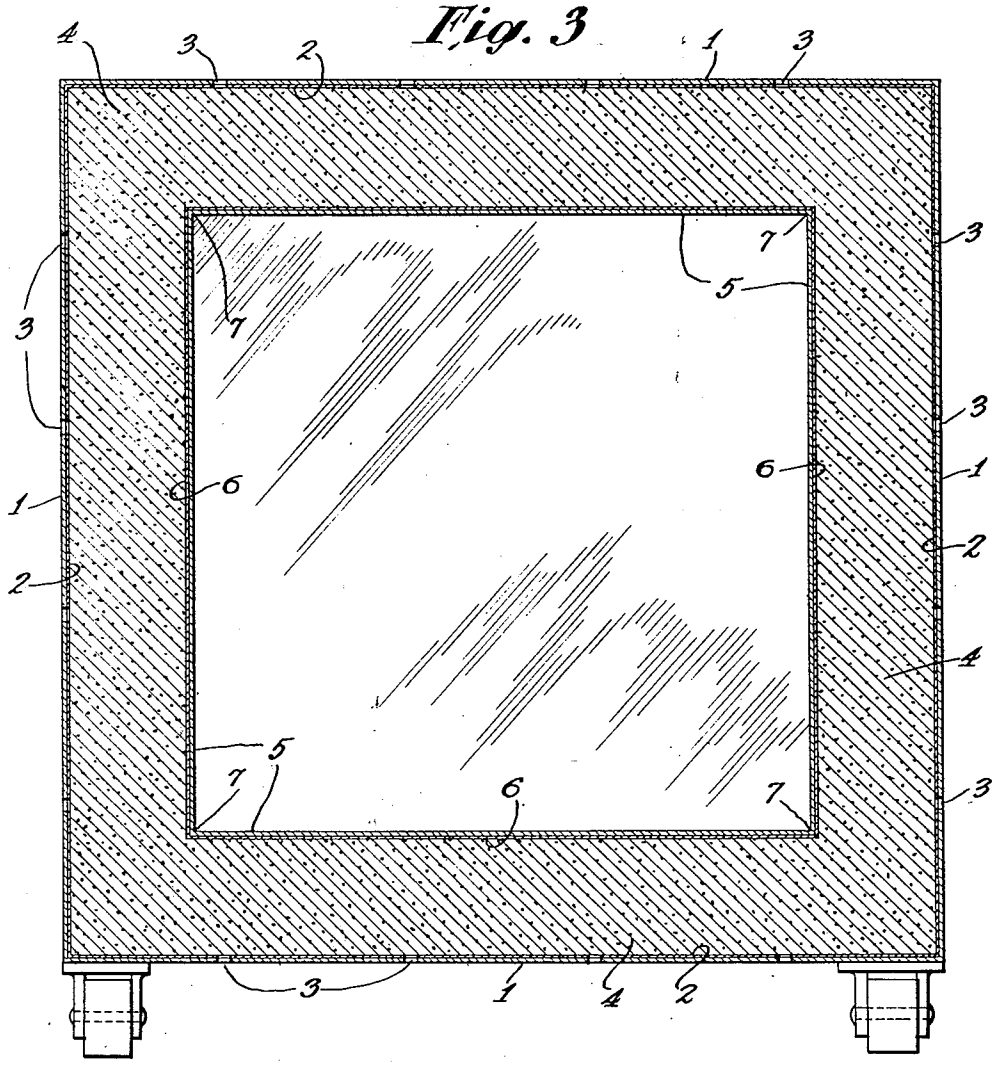
INVENTOR.
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March 4, 1930. E. S. MERRIAM 1,749,222

HEAT RESISTING CABINET

Filed Feb. 19, 1924 3 Sheets-Sheet 2

Fig. 3



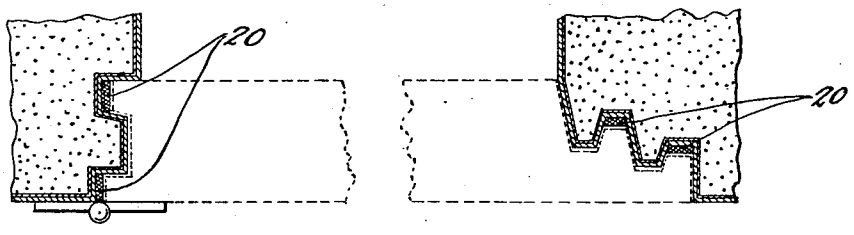


Fig. 4

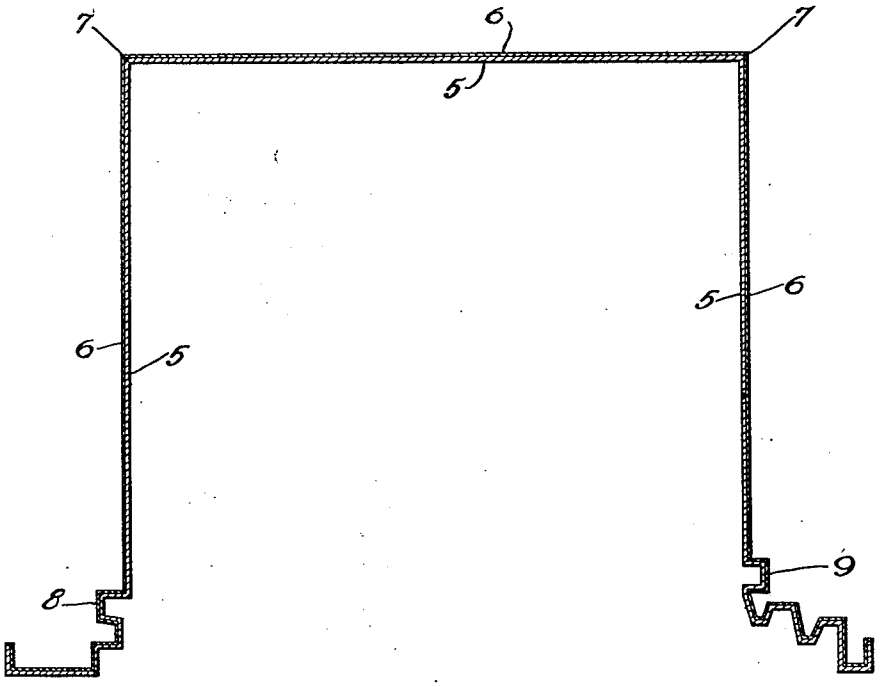
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HEAT RESISTING CABINET

Filed Feb. 19, 1924 3 Sheets-Sheet 3

Fig. 5



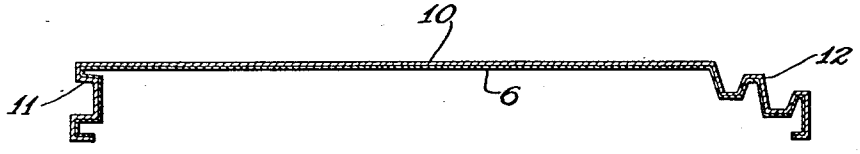


Fig. 6

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UNITED STATES PATENT OFFICE

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HEAT-RESISTING CABINET

Application filed February 19, 1924. Serial No. 693,741.

My invention relates to cabinets, light weight safes, and similar containers for papers, documents, records or other articles which it is desired to preserve from fire or excessive heat, and particularly has reference to articles of the type noted which are so insulated and constructed as to afford high resistance against flame and heat and prevent the penetration of moisture, vapor and gases to the interior thereof.

During the course of experimentations I have found that the rigid exclusion of all steam, vapor and other gases from the interior of a safe or cabinet gives it quite unusual fire-resisting qualities. Therefore, important objects of my invention are to provide means by which the interior walls or surfaces of a safe may be hermetically sealed, and in which safe provision is made for the rigid exclusion from the interior thereof of steam, vapor, gas or other detrimental fluids, and thus to provide for a lower average temperature in the safe under all adverse conditions, avoiding the danger of explosion, and increasing the possibility of protecting articles which might be damaged by steam or by excessive heat.

With the foregoing objects in view, my invention consists in the parts, features, elements and combinations thereof, all as hereinafter described and claimed.

In order that my invention may be clearly understood, I have provided drawings wherein:

Figure 1 is a horizontal section of a safe, cabinet or similar article constructed in accordance with one form of my invention;

Figure 2 is a perspective view of a safe embodying the features of my invention shown in Figure 1, the view being on a reduced scale;

Figure 3 is a vertical section of the safe shown in Figures 1 and 2 embodying my invention;

Figure 4 is a detail, horizontal, sectional view, on an enlarged scale, showing a form of construction for sealing the door thereof;

Figure 5 is a horizontal, sectional view of one form of the inner sealed lining of the safe; and

Figure 6 is a horizontal, sectional view of that portion of the safe door which cooperates with said inner lining.

Referring particularly to Figure 1 of the drawings, it will be seen that my safe consists of three principal parts, viz, an outer casing, an insulating lining, and an inner casing. The door of the safe, or sealing member, consists of three similar parts having the same functions, as will be explained. In the figures of the drawing, particularly Figures 1 and 3, the numeral 1 indicates generally a sheet-metal outer casing, including side, top and bottom walls which, inside, are painted, coated or lined in any suitable cooperative way with waterproof or moisture-resisting material 2. The said walls thus treated are secured together in any convenient, suitable or approved manner so as to render the structure thereof rigid and strong, and at the points of juncture said walls are sealed in usual manner against fire, heat and fluids of all kinds. The said walls, including the inner coating of whatever nature, are provided with apertures 3, the same being as numerous as may be desired. For purposes of illustration, the apertures may be provided substantially as shown in the figures of the drawings, and particularly Figure 2.

The safe or cabinet is provided with an insulating lining 4 of plastic, cementitious material, or any similar mixture containing water to a degree such that it may be sufficiently limpid to be poured or sufficiently soft to be molded to the desired form. Stress is laid upon this insulating lining from the fact that when it is set it must be heat-resisting, homogeneous or monolithic in character, comparatively light, strong and durable and, yet, be capable of allowing the contained or in-

herent moisture, regardless of its assumed form in the presence of heat, to pass out of the mass or be emitted or exuded therefrom with some facility. The mixture of whaever ingredients is poured into a mold of predetermined form and when set it is removed from the mold and subsequently subjected to the action of heat, or an evaporation process, in order to remove therefrom so much of the water as may be desired. Or, the mixture may be poured into the space between the outer and inner casings, when both are embodied in the safe structure, the said casing being thus used as a mold. If the cast is produced as first stated, viz, in a mold independently of the casing, it may constitute (1) the body of a safe, or (2) said cast may form the lining for a safe casing, or (3) may also have combined therewith an inner casing, or (4) may have combined therewith an inner casing only. In the drawings these different forms will be readily understood. Essentials of this form of my invention are that the casting is a one-piece structure, is formed of plastic material, and is molded to form a hollow, jointless, composite block ready for use as a safe or as a lining for a safe. And, regardless of how the inner surfaces of the structure are rendered fluid-proof and heat-resisting, I intend the term "inner casing" to be comprehensive of all forms or means for the purpose.

The insulating material 4 has applied to its inner surfaces a casing or coating of material impervious to fluid, the casing shown being of metal or other heat-resisting material, and which is more or less impervious to moisture. To make this casing, of whatever character or material it may be, impervious to fluids, I paint or coat or otherwise apply to the outer surfaces thereof, or otherwise combine therewith, waterproof or moisture-resisting material 6. The inner casing may be made in any suitable manner, and, regardless of the manner in which it is made, it is an important feature of my invention that the angles or corners 7 thereof shall be hermetically sealed, so as to prevent ingress of moisture, vapor, gas or any other fluid which may be generated by either the chemical constituents of the safe or by the presence of moisture, heat or both. Instead of having an inner casing, such as shown in the figures of drawings, the monolithic insulating lining 4 may be coated, painted, saturated, or otherwise provided, on its inner surfaces, with some suitable heat-resisting and fluid-proof substance or material. This reduces considerably the total weight of the safe; and such weight may be further reduced by omitting the outer casing, thus leaving the body of the safe to consist of the monolithic heat-insulating material rendered fluid-proof on its inner surfaces by suitable means as described.

As an instance of treatment of the inner surfaces of the monolithic material or structure, in order to render it heat-resisting and fluid-proof, I may forcibly project upon said inner surfaces a cementitious coating, of suitable or ample thickness, composed of sand, cement and water in proper proportions. By forcibly projecting the cementitious substance against the inner surfaces of the monolithic structure, or the insulating lining, the surfaces are penetrated and the interstices are filled and the surfaces become glazed and hard, thus making a dense and fluid-proof coating or surface. The coating thus applied in great measure becomes homogeneous with the materials of the inner surfaces of the monolith, and gives to the latter and the surfaces thus treated a strong and durable surface which is heat-resisting and impenetrable to fluids.

Regardless of how the parts of my safe are combined or put together or the materials of which they are constructed, the important features of my invention are that the outer shell or casing, where one is employed, shall be to a certain degree heat-resisting, and that it shall be provided with passages or apertures through which moisture and gases, which may be generated within the same, or in the insulating lining or monolithic structure, under any condition of use or in the presence of excessive heat, such as a fire, may pass outwardly or be exuded; an inner casing of fire, heat and fluid-resisting material, which at all angles or points of connection are hermetically sealed; and an insulating lining of suitable material, which, when finally prepared, will be monolithic in character. The characteristics of the insulating lining are such that moisture, gas or other fluids can be normally emitted or exuded, or will pass out or off therefrom without providing passages or apertures for the purpose. The treatment of the inner surfaces of the monolithic structure or insulating lining prevents the fluids from passing to the interior of the safe; the fluids must pass to the outside of the structure and through the apertures of the outer casing if one is used.

Figure 5 shows the inner metal casing with its fluid-proof outer covering, and the corners or angles 7 thereof are shown in a manner such as to indicate the fact that they are hermetically sealed, regardless of how the condition is brought about. For the purpose of applying a closure, door or seal to the opening of the safe, cabinet or container, the front wall structure thereof is provided with angular flanges 8 and 9, which may be of any contour found desirable for the purpose. The door or seal is composed of one or more members 10, as the case may be, treated in the same manner as the inner casing 5 and having its ends flanged at 11 and 12 correspondingly, and for cooperative interaction with the flanges 8 and 9, respec-

tively, of the said inner casing. The said seal or door or closure also has a front sheet 13 treated in a manner identical with that of the outer casing 1 and provided with perforations 14 for the same purposes. The door or seal or closure is hinged in any suitable manner, as at 15, to one or the other of the flanges 8 or 9 of the inner casing and the structure produced, as just noted, is insulated, as at 16, in the same manner and with the same materials as suggested with reference to the monolithic structure 4. Any suitable form of lock generally indicated at 17 is provided on the door or closure to lock the same in any approved manner, the one desideratum in connection with this lock being that the aperture through which the bolt or shaft 18 passes shall be sealed against the admission of fluids and heat by a suitable character of shield, such as indicated at 19, Figure 1. In order to seal the juncture between the safe or cabinet structure and the door or closure, gaskets 20 of any suitable material may be applied in the recesses, grooves, corrugations or other conformations at the said junctures. The material of these gaskets may be more or less compressible, flexible or elastic, and heat and moisture-resisting, in order to provide the proper seal at the junctures when the door is closed, as shown in Figures 1, 2 and 4.

From the foregoing it will be understood that my safe, cabinet or container, as shown in the drawings, is composed of an inner fluid-proof and fireproof or heat-proof casing, which is surrounded by an insulating lining of monolithic character, which in turn is enclosed or encased by an outer casing provided with a plurality of apertures, and which is to a certain degree heat-resisting. The essential characteristic of this combination of elements is that the inner casing cannot be penetrated by fluids such as steam or other gases; and that any fluids which may be generated in the insulating lining in the presence of excessive heat, or as the result of chemical action, shall be prevented from entering the inner chamber of the safe or cabinet through the inner casing, but will be repelled therefrom and forced to find escape through the apertures of the outer casing, or, in the absence of the latter, shall be exuded from and pass out of the insulating material.

From another aspect, my invention, broadly, contemplates the production of a monolithic structure adapted to be used as a safe or cabinet, and which may be cast, molded or otherwise produced and subsequently treated in order to render it effective as a safe, cabinet or container, and which latter is rendered, on its entire interior surface, impervious to moisture or gases in any manner whatsoever, as, for example, by the combination therewith of an inner fluid-resisting casing, or by the production thereon of an inner surface, which is impenetrable or impervious to fluids, applied thereto as a coating or lining in a manner such as to render it more or less homogeneous therewith.

Some of the essential structural features of the invention as above described may be briefly stated as follows:

(1) An outer casing is produced of any suitable metal or material, and said outer casing is provided on its inner surface with a coating of fluid-proof material, and said outer casing is provided with apertures or passages through which fluids of any character may pass.

(2) A lining for the outer casing, monolithic in character, is produced in any suitable way and by any approved method and applied to the outer casing as an insulation therefor. Said monolithic lining may be produced in a mold of the size of the outer casing, or it may be formed or molded between the outer and inner casings, or in the outer casing with help of an inner frame or mold, the latter to be removed when the plastic insulating material has become properly set.

(3) An inner casing is produced composed of sheet metal or other suitable material, the angles or corners of which are hermetically sealed, and this inner casing, on its outer surface, or surface next to the monolith, may be treated in any suitable manner to protect it from corrosion.

(4) A seal, door or closure, made similarly to the safe itself, is then provided to close the one opening in the safe or cabinet, and such seal or door and the cooperative parts of the inner casing, to which it is hinged, are suitably treated and provided with gaskets in order to properly seal or close what would otherwise be cracks or vents or openings between the inner casing and the door or closure.

(5) And the mechanism of the lock passing through the closure or door is sealed into the latter by a proper form of heat-resisting fluid-excluding shield or device applied in any suitable manner to the outside or inside of the door.

(6) Or, alternatively, the outer casing may be omitted, leaving the outer surface of the monolithic structure exposed as the outside of the safe or cabinet, but without treatment to render it fluid-proof on its outer surface, since it is a characteristic of this monolithic structure that whatever of moisture may remain therein or be an inherent characteristic thereof shall be capable, when chemically changed in the presence of heat, of being emitted, exuded or passed out and off of the outer surface thereof.

(7) Or, instead of a metal inner casing, treated as hereinbefore described, being used, in combination with the monolithic structure, the inner surface of the latter, with or without an outer casing, may be treated so as to

render it fluid-proof and heat-resisting; and, by thus treating the inner surface of the monolithic structure, the gases, vapors or other fluids generated in the presence of heat will be repelled at the inner surface of the structure and caused to pass through the latter in reverse directions and out of or off of the outer surface of the structure.

By making one or the other of the structures described, an article of manufacture is produced in the form of a safe, cabinet, receptacle or container which is fluid-proof, heat-resisting, strong, durable, light, rigid and comparatively inexpensive; and one of the chief characteristics of the article produced is that it cannot produce or develop high heat conduction to the interior thereof. And the safe as a whole is not affected by temperature and moisture, and the contents thereof cannot, therefore, be affected in any detrimental manner.

In the claims following I employ the word "fluid" in its broad sense meaning any form of gas such as steam or vapor which may be generated in the pressure of heat from the insulation or otherwise.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A safe, comprising a solid monolithic body having an opening at one side to a compartment formed therein, an inner imperforate sheet metal casing fitted in said compartment in the body, said casing having an outwardly flared marginal flange at the open end fitting said body around said open end, a perforate sheet metal outer casing on said body, and a closure for the open end of said compartment, said closure having a monolithic panel provided on its inner face with a sheet metal plate having a marginal flange formed for hermetic sealing cooperation with the marginal flange on said inner casing in closed position, and a perforate outer metal plate on said panel, said inner casing providing a moisture-proof container in sealed relation, said monolithic body providing a fire resistant and protective enclosure for said inner casing, and said outer casing providing a protective covering for said monolithic body and releasing moisture exuding therefrom.

2. A safe, comprising a solid monolithic body having an opening at one side to a compartment formed therein, an inner imperforate sheet metal casing fitted in said compartment in the body, said casing having an outwardly flared marginal flange at the open end fitting said body around said open end, a perforate sheet metal outer casing on said body, a closure for the open end of said compartment, said closure including a monolithic panel provided on its inner face with a sheet metal plate having a marginal flange for hermetic sealing cooperation with the marginal flange on said inner casing in closed position, and a perforate outer metal plate on said panel, and a moisture-prooof protective coating between each of said metallic casing and plate members and said monolithic body, said inner casing providing a moisture-proof container in sealed relation, said monolithic body providing a fire resistant and protective enclosure for said inner casing, and said outer casing providing a protective covering for said monolithic body adapted to release moisture exuding therefrom.

3. A safe, comprising a solid monolithic body having an opening at one side to a compartment formed therein, an inner imperforate sheet metal casing fitted in said compartment in the body, said casing having an outwardly flared marginal flange at the open end fitting said body around the open end thereof, and a closure for said compartment including a monolithic panel and a sheet metal plate applied to the inner face of said panel having a marginal flange embracing the edges of said panel and formed for hermetic sealing cooperation with the flange on said inner casing in closed position, said inner casing providing a moisture-proof container for its contents, and said monolithic body and panel providing a fire resistant and protective support for said inner casing.

4. A safe, comprising a solid monolithic body having an opening at one side to a compartment formed therein, an imperforate liner on said body in said compartment having a marginal portion around the opening in the body engaged with the end of said body adjacent said opening, and a closure for the open end of said body including a monolithic panel and a liner on the inner face of said panel having a marginal portion extending over the edges of said panel adapted for hermetic sealing cooperation with the marginal portion of the liner in said body, whereby said monolithic body and panel with the liners associated therewith provide a hermetically sealed compartment having the fire resistant protection of said monolithic body and panel.

5. A liner for monolithic safe bodies adapted to provide a hermetically sealed compartment in said body, comprising an imperforate sheet metal casing open at one side, an outwardly flaring flange on the edges of said casing at the open side thereof, and a closure liner having an imperforate sheet metal plate formed to fit the open side of said casing and having a marginal flange formed to engage the flange on said casing, said flanges being formed with complementary interfitting channels and ribs having sealing cooperation to hermetically seal the joint between said flanges in the engaged relation thereof.

6. A liner for monolithic safe bodies adapted to provide a hermetically sealed

compartment in said body, comprising an imperforate sheet metal casing of substantially rectangular form in cross section having one open side, and a marginal flange integral with said casing at the open side and extending laterally and outwardly from the open side of said casing, said flange being formed with a plurality of progressively offset portions providing alternate channels and ribs extending longitudinally thereof.

Signed by me at Monroe, La., this 12th day of February, 1924.

EDMUND S. MERRIAM.