

1,041,395.

2 SHEETS—SHEET 1.

Fig. I.

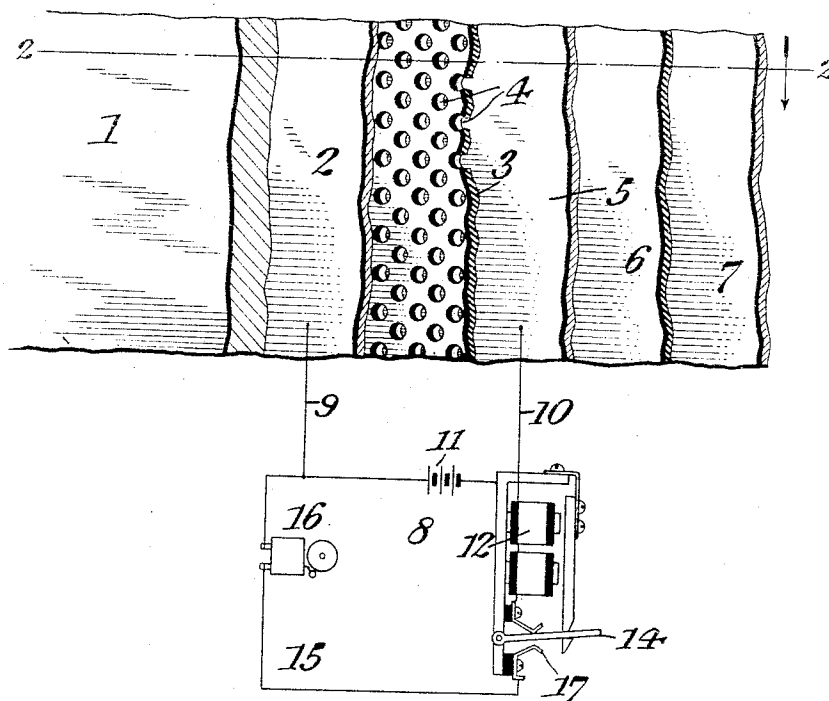


Fig. 2.

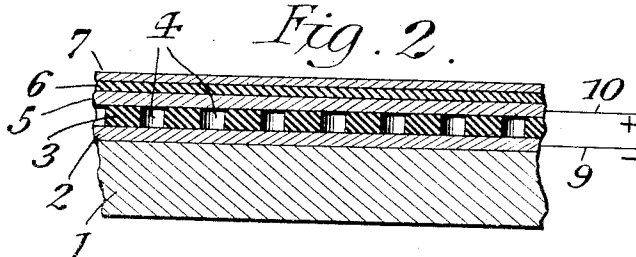
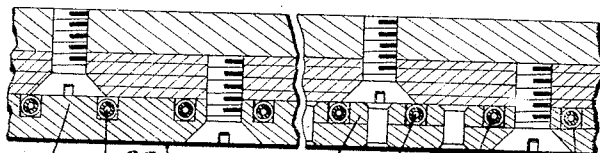


Fig. 6. 1



Witnesses: 27a | 32 | 31
+ | |
A. R. Appleman
Miss Costigan

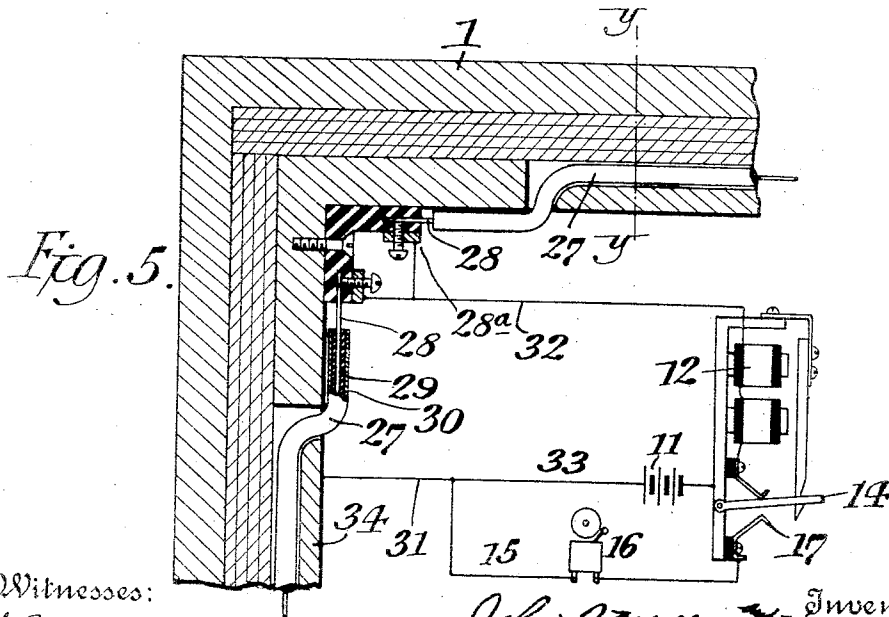
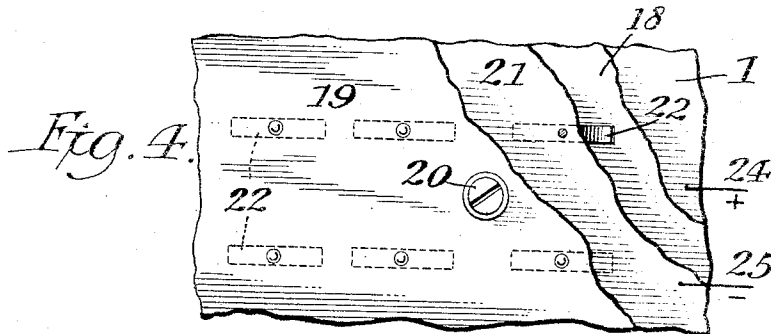
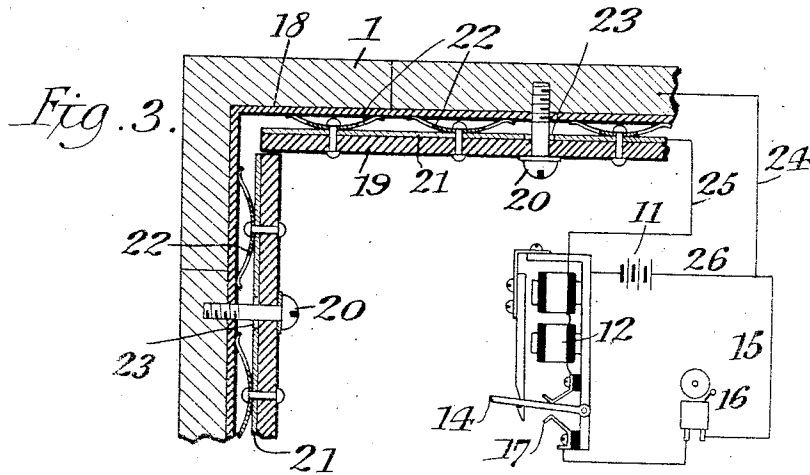
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J. P. WILLIAMS & H. HUH.
ELECTROTHERMOSTATIC LINING FOR VAULTS, SAFES, &c.
APPLICATION FILED DEC. 8, 1910.

1,041,395.

Patented Oct. 15, 1912.

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JOHN P. WILLIAMS AND HERMANN HUH, OF NEW YORK, N. Y., ASSIGNORS TO
ELECTRIC BANK PROTECTION COMPANY, A CORPORATION OF DELAWARE.

ELECTROTHERMOSTATIC LINING FOR VAULTS, SAFES, &c.

1,041,395.

Specification of Letters Patent.

Patented Oct. 15, 1912

Application filed December 8, 1910. Serial No. 596,268.

To all whom it may concern:

Be it known that we, JOHN P. WILLIAMS and HERMANN HUH, both citizens of the United States, and residents of New York, in the county and State of New York, have invented certain new and useful Improvements in Electrothermostatic Linings for Vaults, Safes, &c., of which the following is a specification.

This invention relates to electro-thermostatic linings for vaults, safes or other structures to be protected, and it has for its object to provide an improved lining structure adapted for effective use in connection with general burglar-alarm systems.

In its operative characteristics, our improvements are adapted to insure combined protection both as a burglar-alarm and as a fire alarm, the thermostatic and other elements of the lining structure being suitably connected in circuit with the signals or bells of the burglar-alarm system.

Our invention is further designed to afford effective and certain protection against attempts to either cut into or drill or penetrate the protected structure and against attacks upon the same by the application of heat or flame for the purpose of burning or annealing the steel walls of vaults, safes or other protected structures.

In the drawings—Figure 1 is a plan view, partly broken away, of a portion of the lining or plate member comprised in our main improvements, showing the relative arrangement of the superposed members and the circuit connections with the general features of an alarm system. Fig. 2 is a cross-section on the line 2—2, Fig. 1. Fig. 3 is a cross-section, illustrating a modified arrangement of the structural members of the lining or plate and showing circuit connections as in Fig. 1. Fig. 4 is a plan view, partly broken away, of the modified construction shown in Fig. 3. Fig. 5 is a cross-section of another modification employing a thermostatic wire and showing circuit connections as in Figs. 1 and 2. Fig. 6 is a cross-section on the line $y-y$, Fig. 5.

Corresponding parts in all the figures are denoted by the same reference characters.

Referring to the drawings, 1 designates the plate which forms the outer wall of a vault, safe or other structure to be protected. This plate is usually of steel of suitable thickness. In our improved construc-

tion as shown in Fig. 1, a thermostatic plate, 2, consisting of suitable conducting and fusing metal or a composition, which will fuse or melt at a desired temperature and is affected by the action of heat or flame, is disposed against the inner surface of said plate 1 and contacts therewith. An insulating plate, 3, is disposed next to said thermostatic plate 2, and has perforations, 4, there-through, the operative purpose of which will be hereinafter set forth. Arranged next to this insulating plate 3, is another plate, 5, composed of conducting material, and this plate is preferably, though not necessarily, of fusible metal or material. Another plate, 6, of insulating material, is preferably disposed next to the plate 5, and will serve to protect the underlying elements against mechanical injury or the effects of moisture, etc., and next to this plate 6 is also preferably disposed a plate, 7, of sheet steel, to protect the complete electro-thermostatic lining structure and give a finished appearance at the inside surface. An alarm circuit, 8, has its terminals, 9 and 10, respectively connected with the conducting plates 2 and 5, and included in said circuit is the usual battery, 11, and magnets, 12, controlling an automatic drop, 14, which is adapted to close a local circuit, 15, having a bell or alarm signal, 16, therein. In case of an attack by the application of heat or flame upon the steel partition 1 of the structure just described, the heat will cause the thermostatic plate 2 to fuse or melt and the fused metal will flow through the perforations 4 to contact with the conductor plate 5, thus closing the alarm circuit 8, which energizes the magnet 12, releasing the drop 14 and permitting it to engage with a contact, 17, of the local alarm circuit 15, to close said circuit 15 and cause the operation of the alarm bell or signal 16. Should an attempt be made to cut into or drill or penetrate through the elements of the structure, such action would cause a short circuit through the contact of the penetrating tool with the conducting plates 2 and 5 and would establish a circuit as above and actuate the alarm.

In the modified construction of our invention and improvements as shown in Fig. 3, we employ as the thermostatic element a layer or plate, 18, of non-conducting material, such as beeswax, which will fuse, melt

or dissolve under the action of heat, and said layer or plate is disposed over the inner surface of the outer wall or partition 1 of the protected structure. Arranged in spaced parallel relation to said layer or plate 18 is an insulating plate, 19, carried by screws, bolts or pins, as at 20, which extend through said plate 19 and into the wall or plate 1 of the protected structure. A metallic conducting plate; 21, is provided on the interior face of the insulating plate 19, and springs, 22, are disposed in the space between the conducting plate 21 and layer or plate 18, said springs being secured to and in circuit connection with the plate 21 in any suitable manner so that their ends have tensional engagement with the layer or plate 18. The plate 21 is cut away, as at 23, to prevent short circuiting through the screws 20. The terminals, 24 and 25, of an alarm circuit, 26, are connected to the plates 1 and 21, and thus, in the modified construction just described, should an attack be made upon the structure by heat or flame, the fusible thermostatic layer or plate 18 will fuse, melt or dissolve, allowing the springs 22 to contact with the plate or wall 1 of the protected structure and close the alarm circuit to actuate the alarm, and should an attempt be made to cut into or drill or penetrate the structure the contact of the penetrating tool with the plates 1 and 21 will close the alarm circuit and actuate the alarm.

In the construction of our improved electro-thermostatic lining as shown in Fig. 5, a thermostatic element, 27, is employed and is constituted by a conducting wire, 28, having a coating or jacket, 29, of fusible insulating material, over which is carried a metal covering, 30. This thermostatic element 27 is carried between fillers, as at 27^a, within the wall 1 of the protected structure, or the wall plates may be grooved for this purpose, and the exposed ends of the wire 28 are secured to suitable insulating devices within the structure, as shown at 28^a, to provide for the connection of one terminal, 32, of an alarm circuit, 33, the other terminal, 31, of which is connected to the inner metallic plate, 34, of the wall of the protected structure.

When an attack is made upon the protected structure as in the modified construction shown in Fig. 3, by heat or flame, the fusible and insulating material, 29, surrounding the wire 28 and within the metal covering 30, will fuse, melt or dissolve and permit contact of the wire 28 with the metal covering 30 which is in contact with the metal plate 34, and thus establish a circuit through the terminals 31 and 32 and cause the actuation of the alarm.

It will be understood that our improvements are adapted for effective operation under any circumstances or conditions

where it is desired to protect a structure against either the action of heat or flame or an attempt to cut through or drill or penetrate the wall or partition of the structure, and that the improvements are operatable in connection with alarm systems working on either open or closed circuits or on both open and closed circuits, as will be readily understood.

We do not desire to be understood as limiting ourselves to the detail features of construction and arrangement, nor to the circuit arrangements, as herein shown and described, as it is manifest that variations and modifications therein may be resorted to in the adaptation of our invention to varying conditions of use, without departing from the spirit and scope of our invention or improvements. We therefore reserve the right to all such variations and modifications as properly fall within the scope of our invention and the terms of the following claims.

Having thus described our invention, we claim and desire to secure by Letters Patent:

1. In a protective lining for vaults and other structures, lining members, spaced thermostatic conducting plates in layer with said lining members and an alarm circuit including said spaced layer plates and operatable to actuate an alarm when said thermostatic layer plates are subjected to the action of heat.

2. In a protective structure for vaults, safes and the like, outer and inner metallic plates, an alarm circuit, thermostatic members constituting electrical conductors and inclosed by said outer and inner plates and in layer therewith and connected with the positive and negative terminals of said circuit, and an insulating plate disposed in layer between said thermostatic members and having openings through which the thermostatic members contact one with the other when subjected to the action of heat, said alarm circuit including said thermostatic members and operatable to actuate an alarm when said members fuse into contact.

3. A protective lining for vaults, safes or other structures, comprising outer and inner metallic plates, outer and inner conducting plates inclosed by said first-named plates and in layer therewith, one of which conducting plates is fusible, means for insulating said conducting plates from each other when in normal condition, and an alarm circuit including said conducting plates and operatable to actuate an alarm when said lining is subjected to the action of heat.

4. A protective structure comprising outer and inner plates, outer and inner conducting plates inclosed by said first-named plates and in layer therewith, one of which conducting plates is fusible, an insulating plate

extending in layer between said conducting plates and having openings therethrough, and an alarm circuit including said conducting plates and operatable to actuate an alarm
5 when said fusible conducting plate fuses through the perforations of the intermediate insulating plate to contact with the other conducting plate under the action of heat.

10 5. A protective lining for vaults, safes and other structures, comprising outer and inner metallic plates, means for insulating said plates from each other, an alarm circuit, and spaced conducting plates inclosed by
15 said first named plates and in layer there-

with and included in said circuit, one of which conducting plates is fusible, said alarm circuit being operatable to actuate an alarm when said fusible conducting plate fuses into contact with the other conducting
20 plate under the action of heat.

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

JOHN P. WILLIAMS.
HERMANN HUHNS.

Witnesses:

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E. SIDNEY BOOTH.